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Risk prediction and decision making in policing – Humans, Algorithms and Data. (A study of processes at Bedfordshire, Hertfordshire, and Cambridgeshire police)

Miss Ganiat Omolara Kazeem

A thesis submitted in partial fulfilment of the requirements of The Open University, for the award of Doctor of Philosophy

July 2022
Declaration

I hereby declare that the work presented in this thesis has not been submitted for any other degree or professional qualification, and that it is the result of my own independent work.

Miss Ganiat Omolara Kazeem

Date
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Abstract

Modern policing work, as this thesis exemplifies, involves iterative evaluation of information and intelligence including application of organisational and practice knowledge to identify and assess risk factors and make decisions. The job of policing is inextricably connected to people, information, communication, and the technological artefacts that enable or support policing. In particular, the use of information and communication technologies (ICTs) in policing is inevitably influenced by regional and national policies, legislation, and public scrutiny.

This thesis reports on inductive interpretive multi-sited ethnographic work in the wild, situated in two closely related police forces with limited insights from a third. The police forces collaborate sharing their information systems and information technology services. The research focussed on police practices, seeking an understanding of information use, communication practices, organisational knowledge, use of information systems and the scope for data exploitation in relation to police risk prediction and risk decision making. The research also enquired about how these were potentially influenced by politics, policy and legislation as seen through the worldviews of police officers.

Insights were gathered through field immersion by observing and interviewing police officers at multiple sites for approximately 670 hours over a 3-year period. Data was validated using activity diagrams and member checking. The iterative ethnographic data collection process and persistent immersion in field supported elicitation of in-depth insights. Given the access to diverse groups of stakeholders insights highlighting problematic situations were also gathered. Data analysis was therefore pluralistic, conducted using thematic analysis for ethnographic insights and Checkland’s soft systems methodology for the visualisation and resolution of problematic situations.
The insights from the ethnographic research are presented in this thesis through descriptions, explanations and narratives including vignettes, selected quotes, and activity diagrams. The multifaceted and sociotechnical nature of modern policing is highlighted, contributing to existing ethnographic accounts of policing through detailed characterisations of the police organisation and the people who do policing work including their practices. An epistemology of police information use and communication practices is advanced alongside empirical insight into the use of information systems in the policing organisation. The contextual links between information, information systems and organisational memory are highlighted including the criticality and role of ICTs and technological artefacts with regard to day to day risk management and decision making as seen through the eyes of police officers.

Insights that inform future research and policy development are also advanced, highlighting the interdependence of socialised policing practices and the knowledge work modern police work involves. Emergent factors that influence police use of information and technologies are contextualised including organisational factors that influence and shape the uptake of algorithmic tools, contributing to existing knowledge around the use of and value of information and knowledge in policing. The complexities of adhering to politically and socially driven policies including those related to cooperative and collaborative working contexts during the pandemic are highlighted, alongside analysis of problematic situations using Checkland’s soft systems methodology.

Overall, the thesis draws attention to the impact of policy and reform on resourcing, demand, and efficacy of use of information, communication practices and use of ICTs in policing contributing to existing research into police informatics and reform.

Keywords: information systems, information cycle, communication cycle, sociotechnical policing, risk prediction, decision making, computer supported cooperative work, knowledge management, ethnography, multi-sited workplace studies.
Publications associated with this research

Some of the insights presented in this thesis have constituted the basis for conference papers and journal publications. This research, methodology in practice, data collection, thematic analysis, soft systems methodology instances, emergent themes and all discussions and content of this thesis are wholly my own work including the papers below which this thesis expands and builds upon.


Acknowledgements

“If you’re going to try, go all the way. There is no other feeling like that. You will be alone with the gods, and the nights will flame with fire.

do it, do it, do it.

do it.

All the way

You will ride life straight to perfect laughter. It’s the only good fight there is.” Charles Bukowski circa 1991-1994

There’s a certain fragility when you name names, you name one, forget one, and it could go wrong. So, I’ll say instead that scores of people have contributed to this effort, most of them seeking no praise.

Finishing what one starts is often not as easy as it looks, being that life is supposed to be simple, we often anticipate that we will have cheerleaders for good journeys and causes. But that doesn’t always happen.

In this journey, I have learned that rather like the elephant, one must remember how to find salt in the dark.

But I have also had friends along the way. And as is done, rightly so too, I send silent hopes for pleasant joys to every cheerleader, wherever you are, may the forces be with you and for you.
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<table>
<thead>
<tr>
<th>Term</th>
<th>Full meaning/definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>3i</td>
<td>The 3-i model (i.e., interpret, influence, and impact). Three components that explain the role of the crime intelligence analysts, decision makers and criminal environment.</td>
</tr>
<tr>
<td>4i</td>
<td>The 4-i model (intent, interpret, influence and impact) is helpful in explaining the roles and the relationship between key actors of the concept behind intelligence led policing (ILP). The abbreviation refers to: the criminal environment, the criminal intelligence analyst, and the police decision-maker.</td>
</tr>
<tr>
<td>ANPR</td>
<td>An acronym for the automatic number plate recognition camera system used in England.</td>
</tr>
<tr>
<td>ASSET</td>
<td>A youth justice recidivism tool developed by the University of Oxford centre for criminological research. Introduced by the youth justice board in 2000, it uses twelve static criteria to assess the potential for youth recidivism.</td>
</tr>
<tr>
<td>Big Data</td>
<td>Data that is collected on a large scale during transactional processes that involve the exchange of information, storage of information and processing of information such that it becomes a collection of small pieces of information about several entities and several people, in one big ‘lump’ which then requires or can only be understood if it is sorted, arranged and or organised into meaningful sets.</td>
</tr>
<tr>
<td>Term</td>
<td>Description</td>
</tr>
<tr>
<td>---------------</td>
<td>---------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Birchard Enquiry</td>
<td>The Birchard inquiry was a public inquiry into child protection, which was produced after the subsequent media attention around the Soham murders, where two young girls were murdered in Cambridgeshire by their school caretaker Ian Huntley.</td>
</tr>
<tr>
<td>CoP</td>
<td>College of Policing</td>
</tr>
<tr>
<td>CSCW</td>
<td>Computer Supported Cooperative Work</td>
</tr>
<tr>
<td>DASH</td>
<td>An acronym for the Domestic Abuse, Stalking and Harassment and Honour-based violence risk identification, assessment, and management model. Created by a multi-agency expert panel in 2008, it comprises 27 risk identification and scoring questions. It is used to identify the extent of existing and ongoing risk of harm for domestic abuse victims.</td>
</tr>
<tr>
<td>EBIT</td>
<td>EBIT is an investigative triage statistical tool developed for use in policing in 2016. It computes the probability of positive investigative outcomes by analysing facts about crime incidents for the presence of certain indicative evidential factors. It is used to evaluate the likelihood of positive investigation outcomes in cases of assault and actual bodily harm (involving minor injury) and public order offences (under sections 4, 4A and 5 of the public order act).</td>
</tr>
<tr>
<td>ELP</td>
<td>evidence-led policing (also evidence led practice) is a term used to describe the adoption, implementation of approaches that are based on research in policing.</td>
</tr>
<tr>
<td>ERSOU</td>
<td>Eastern Region Special Operations Unit</td>
</tr>
<tr>
<td>Acronym</td>
<td>Definition</td>
</tr>
<tr>
<td>---------</td>
<td>------------</td>
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<tr>
<td>ESMCP</td>
<td>Emergency services mobile communications programme</td>
</tr>
<tr>
<td>GDPR</td>
<td>General Data Protection Regulation is a legal framework that sets guidelines for the collection and processing of personal information from individuals who live in the European Union</td>
</tr>
<tr>
<td>HCI</td>
<td>Human Computer Interaction</td>
</tr>
<tr>
<td>HMIC</td>
<td>Her Majesty's Inspectorate for constabulary (Now HMICFRS)</td>
</tr>
<tr>
<td>HMICFRS</td>
<td>Her Majesty's Inspectorate of Constabulary and Fire &amp; Rescue</td>
</tr>
<tr>
<td>ICT</td>
<td>Information and communication technologies</td>
</tr>
<tr>
<td>Information</td>
<td>Information in policing is defined as &quot;pieces of raw, unanalysed data that identifies persons, evidence, events, or illustrates processes that indicate the incidence of a criminal event or witnesses or evidence of a criminal event.</td>
</tr>
<tr>
<td>ILP</td>
<td>Intelligence-led policing is a management framework that uses criminal intelligence to develop approaches and plan operational and strategic actions for preventing and reducing crime and threats including the management of resources required to do so.</td>
</tr>
<tr>
<td>Intelligence</td>
<td>The product of adding value to information and data through risk assessment, decision making and or analysis i.e., the product of an analytic process in policing that evaluates information collected from diverse sources, integrates the relevant information into a cohesive package, and produces a conclusion or estimate about a criminal phenomenon by using the scientific approach to problem solving (i.e.,</td>
</tr>
<tr>
<td>Term</td>
<td>Description</td>
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<tr>
<td>--------</td>
<td>-------------</td>
</tr>
<tr>
<td>analysis</td>
<td>Also often described as ‘intel’ information considered to be of value to policing activities and common way of referring to information of relevance to policing</td>
</tr>
<tr>
<td>IOPC</td>
<td>The independent office for Police Conduct</td>
</tr>
<tr>
<td>IS</td>
<td>Information systems</td>
</tr>
<tr>
<td>Lammy review</td>
<td>The Lammy Review, chaired by David Lammy MP, was an independent review of the treatment of, and outcomes for, Black, Asian, and Minority Ethnic (BAME) individuals in the Criminal Justice System (CJS) in 2017</td>
</tr>
<tr>
<td>LEDS</td>
<td>Law enforcement data service: a new database merging the police national computer and the police national database.</td>
</tr>
<tr>
<td>MoPI</td>
<td>Management of Police information policy which incorporates guidance regarding use, storage, sharing and exploitation of information aligned to approved practices, legislation, and policing purposes</td>
</tr>
<tr>
<td>NDM</td>
<td>National decision model</td>
</tr>
<tr>
<td>NIM</td>
<td>National intelligence model</td>
</tr>
<tr>
<td>PACE</td>
<td>Police And Criminal Evidence Act 1984: refers to the Police and criminal evidence act and its application in policing</td>
</tr>
<tr>
<td>PEQF</td>
<td>Police education and qualifications framework</td>
</tr>
<tr>
<td>PITO</td>
<td>Police Information Technology Organisation</td>
</tr>
<tr>
<td>Acronym</td>
<td>Description</td>
</tr>
<tr>
<td>---------</td>
<td>-------------</td>
</tr>
<tr>
<td>PNC</td>
<td>Police National Computer introduced in 1974 holds personal data and other information relating to individuals including arrests, charges, court disposals, convictions and information about vehicles and property.</td>
</tr>
<tr>
<td>PND</td>
<td>Police national database, set up following the Birchard Inquiry into the Soham murders used to store data and information and allows the police service to share local information and intelligence on a national basis, particularly to safeguard children and vulnerable people, to counter terrorism, and to prevent and disrupt serious and organised crime.</td>
</tr>
<tr>
<td>Scarman report</td>
<td>The Scarman report was commissioned by the UK Government following the 1981 Brixton riots. Lord Scarman was appointed by the Home Secretary after the riots in April 1981 to hold the enquiry into the riots. The Scarman report was published on 25 November 1981.</td>
</tr>
<tr>
<td>SOCA</td>
<td>Serious Organised Crime Agency</td>
</tr>
<tr>
<td>SSM</td>
<td>Soft systems methodology</td>
</tr>
<tr>
<td>THRIVE</td>
<td>The THRIVE tool is used in policing control rooms to risk assess and evaluate demand on police resources and risk of harm to citizens</td>
</tr>
</tbody>
</table>
Chapter 1: Introduction

“It is not just the machine that I wish to discuss, prodigious though its capacity may be, but the institutions, processes and policies required for its effective use.” - Sir Ian Lloyd at the Commons sitting on computing in 1992

There is an established history of interest in policing spanning the decades. Notably, the 80’s saw policing come under public and political scrutiny due to heightened concerns stemming from politicisation of policing and police cultures (Benyon, 1985; Jefferson, 1983). Persistent spates of symbolic police action coupled with discriminatory dispensation of ‘sus’ laws precipitated clashes between police officers and citizens leading up to the Brixton riots, Liverpool riots and the New cross march (UK Parliament, 1981; Benyon, 1984; Benwell et al., 2020). The uprisings saw notable changes to legislation with the repeal of ‘sus’ laws and enactment of the Police and Criminal Evidence Act, 1984 (PACE), however the opprobrium around policing continued into the 90’s and beyond the turn of the century with sustained concerns about police powers and cultures (Waddington, 1999; McLaughlin, 2006), criticisms about police procedures (McPherson, 1999), response to serious crimes (Rowe, 2007a; Frank et al., 2018) problems with information management and information sharing (Birchard, 2004; Rowe, 2007a; Stainer, 2013), concerns about communication and risk decision making errors (Scraton, 2013), and governmentalisation of crime data, hidden crime rates and the implications of prevailing rules on ‘recorded crimes’ for social justice (Downes, 1997).

In the last 15 years, interest has also been centred on the consequences of making policing superlatively economical (Innes, 2011; Brown, 2014), challenging poor policing practices and working cultures (Choongh, 1998; Loader and Walker, 2001; Shepherd, 2017), including police misconduct (IOPC, 2019; IOPC, 2020; IOPC, 2021), corruption and

1 sus law - Local slang describing discretionary police powers under Section 4 of the 1824 Vagrancy Act (now repealed). This legislation gave police the power to stop, search and arrest anyone suspected of loitering with intent to committing arrestable offence
scandals (Holdaway, 1980; Greer and McLaughlin, 2015) concerns about legitimacy (Worden and McLean, 2017; HMICFRS, 2022), and slow adoption of technologies and innovation (Ashby et al., 2016; Babuta, 2017).

Police forces continue to be subject to pressures to operate efficaciously (HMICFRS, 2022), take proactive reformative action (James, 2013) and institute relevant processes to address legitimacy concerns (Hough et al., 2010; Willis et al., 2014; Worden and McLean, 2017; Pearson and Rowe, 2020b). In recent times, these have led to changes such as the restructure of police standards and oversight through the creation and extension of new powers to a new independent office for police conduct in 2018 (Heaton and Tong, 2022) and a drive toward professionalisation of policing through the implementation of work based police apprenticeships (Leek, 2020), institution of the police education and qualifications framework (PEQF) (Ramshaw and Soppitt, 2018; Shohel et al., 2020) and mandating the policing undergraduate degree (Ramshaw and Soppitt, 2018; Williams et al., 2019) for new police officers. Despite this, the demand for police forces to engage with and embed innovative improvements through the use of better and more advanced technologies has remained consistent and persistent (Home Office, 2011b; Home Office, 2011a; GLA, 2013; Ariel, 2019; Fox, 2019; Barber (2022).

This research being concerned with rationalisation of police risk prediction and decision making with respect to the use of information and communication technologies; it was relevant to seek conceptual understanding of police practices regarding this with particular attention to the cultural context of their work and agency. Cultural contexts have been explored previously by Reiner (1992a), (Chan, 1997), Cockcroft (2020b) and others: highlighting the sociological implications of dichotomous cultures in policing and the consequential infrastructural embedment of poor policies and practices. They highlight the

---

2 See Chapter 2 for a review of literature related to the police organisation, police practices and police working cultures.
implications of neoliberalism and the focus on risk society given police canteen cultures have persevered beyond the ‘administrative’ migration from rudimentary/traditional to archetypically modernised policing. They also argue that unchanging cultures and undue faith in scientific and technological innovation limit scope for police innovation and reform given the dynamic urbanisation and migration that characterises modern society.

The discourse on police cultural representations gives rise to three considerations. The first relates to arguments by Baldwin (1989) regarding the need to explore reformative legislation on police practices and cultures and the implications of the consequential drift toward self-regulated ways of working. The second as discussed by Manning and Hawkins (1989) is the need understand the nature of information use and the contextual breadth of role specific values ascribed to this use beyond the work of street patrols1. The third relates to the ideations made by Reiner (1992a) and Cockcroft (2020b) amongst others regarding police cultures and the arguments Morgan (1989) and Chan (1997) made regarding the for understanding (and characterisation) of multiple cultures in policing in the context of rank, role/specialism and geolocation including a delineation of police cultures which undermine good policing practice.

These considerations are not novel. Scholars such as Punch (1983) have previously argued that understanding of police processes in the context of political influence, resourcing and political-economic power bases is limited. Hough (1980) also discussed the implications of assumptions about police practices and how these side-line queries related to their values and performance, delimiting the successful implementation of ICTs as a reformative solution. He highlighted the need to gain better understanding of the way technologies are used in policing, arguing that the increased use of ICTs in policing projects a façade of

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1Research pre 2002 referring to police foot patrols highlight a police structure where sworn police officers performed street patrol duties. Police community support officers (PCSOs) were introduced in September 2002 under Section 38(2) of the Police Reform Act 2002. They are designated with some police powers and have largely taken over the parts of the role of foot patrols and community-based work in neighbourhood policing teams in England and Wales providing support to sworn police officers who now predominantly focus on response and intervention work. (In Wales referred to as Swyddog cymorth cymunedol yr heddlu, SCCH)
sophistication and professionalism. This façade, Hough argued, inferred the adoption and use of technologies is indicative of highly specialised activities which can only be understood with high levels of expertise, conjecturing outsiders lack competence to assess their true role and performance.

Furthermore, other scholars such as Brown (2014) and Bacon (2014) have discussed the implications of the pervasion of technologies and cultural contexts of changes as a result of this since the onset of the 2nd wave of police reform into the current 3rd wave highlighting the complex dynamics that characterise policing today. In particular, Bacon (2014) draws attention to the evolution of sub-cultures in the face of scandals, corruption and failures and politicisation of the police discussed earlier in this chapter further complicated by imported ideas, home grown initiatives and legislative changes discussed by Savage (2007).

Brown (2014) further argues that this push-pull between working cultures, innovation and reform are the result of the rapid pace of change in policing given the anxieties over integrity which conflate problems at the expense of other priorities within policing organisations. This and the effects of financial austerity they argue, gives rise to competing priorities, dilution of professional judgment and divergent expression of discretion compounded by persistent and prevailing 'risk aversion' cultures as discussed by Harris (2012).

Despite these insights, O'Neill (2016) later reiterated the core criticisms Chan (1997) made of policing culture literature, highlighting the need for research to account for individual agency, differentiation and the role of the wider context in which police cultures and practices are structured. In view of this, it became evident that an exploration of the work of risk predictions and decision making in policing centred on examining the context of computer-supported cooperative work and the nature and context of information, knowledge and information systems use and exploration of perceptions and developments (including
As a researcher, my interest in exploring and understanding policing practices around use of information and information systems stemmed initially from conducting previous research into the use of technologies in policing which involved extensive field immersion and finding limited research efforts into the use of information and information and communication systems in policing.

Although some of the mentioned scholarly contributions and those included in the accompanying literature review highlight the context of policing and police practices, their conceptualisation of practices in context and explanations or police work are limited. Additionally, the existing research provides limited understanding of the diverse nature of police work practices, including characterisation of current processes and procedures at the police forces involved in this research. Furthermore, although the existing literature paves a path to understanding policing and police work, there are limitations regarding amplification of diverse voices and practices including acknowledgements of variation explicitly.

Furthermore, as reflected in the accompanying Literature review, research efforts that characterise the current use of information, knowledge, and intelligence, including the use of data in policing in England and Wales are limited in scope and currency. Additionally, during literature searches, very little research was found to characterise the unique ecosystem and perspectives of policing at the participant police forces. This was the same for research focusing on the people, organisation, and their use of information systems and technologies for risk assessments and decision-making practices, processes, and procedures.

This paucity of research into social practices and culturally structured police views including their perspectives regarding information, communications, and technological use in the context of risk predictions and decision making was therefore the fundamental motivation...
for this research. The research questions, goals and research field work was structured around first learning, then seeking understanding by asking what do we know about the emergent socialised practices, and behaviours in the participant police forces?, What does risk evaluation and prediction in policing involve, who does it, why and how?, What do we know about police communication processes, including their use of information, knowledge and information systems for risk prediction and decision making?; What are the meanings ascribed to information, knowledge, technologies and innovation and what are the views of those who do the work regarding innovative use of technologies?.

To answer these questions, this research set out to gain in-depth contextual understanding of police work and an understanding of the practices, behaviours, knowledge, and sense making of the humans who collect, record, manage and exploit data in the context of risk assessments, and decision-making. It considered police meaning making, police practices and the purpose of information that becomes data. It also sought an understanding of the way police interact with and express themselves when using data and information systems. This included seeking understanding of the current use and perceptions of the use and exploitation of information, knowledge and data generated in policing to inform algorithmic tools in the context of risk decision making and service delivery.

This central thesis of this work then, is reporting on inductive interpretive research into information use and exploitation, communication, and the use information systems in the process of risk predictions and decision making in policing at Bedfordshire and Hertfordshire police forces in the East of England with limited insights from Cambridgeshire police force. The highly sociotechnical nature of modern police work exemplified in this thesis is juxtaposed against what has been reported in previous research into digital innovation in policing. In the main, it enhances existing understanding of the work of policing with respect to risk predictions and decision-making practices and procedures including subjective understanding (and implications) of how they use of information,
knowledge and information and communication technologies (ICTs). It also provides an account of what was learned about the work of policing as an outsider, exploring and understanding the job including prevailing practices and cultures in the contexts outlined.

The research adopted the interpretive practice lens outlined by Orlikowski (2000) and Kuutti (2013), observing the persistent recursive construction and reconstruction (structurisation) of behaviours and practices by individuals as they interact with one another, their environment, and technologies in the conduct of their duties. This approach enabled contextual understanding of the continuous enactment of structures associated with use of technologies, supporting the understanding of salient aspects of human agency. It also supported understanding of the dichotomies expressed in diverse activities and the varied assignation of meanings to police processes and contexts of working practices dependent on roles and duties. This supported elicitation of views and observation of situational behaviours regarding information, communication and ICTs including the dynamics between the people and organisations alongside the influences brought about by development, power, and change.

The ethnographic research reported in this thesis involved interviews and field observations in frontline policing and specialist investigatory and support departments at the participant police forces. The research questions and related goals were treated as inductive lines of enquiry guiding the ethnographic exploration of complex ideas and phenomena through observation of the social interactions during operational, specialist and public levels of policing. The practice approach was considered an art of learning and understanding following the traditions outlined by Randall et al. (2018), exploring meanings and interconnections between people, practices and processes.

The research focussed on understanding and characterising the use of information and information systems in the process of risk management and decision making. This involved
exploring the way policing is done, including social relationships and joint working practices within the policing organisation and between the police and external agencies. This was achieved by treating observed phenomena as socially constructed and reconstructed insights into historical evolution over time as described by Kuutti and Bannon (2014), seeking understanding and characterising the routines and social practices around technologies through the interactions between people, as they conduct tasks, communicate, interact with each other and information systems, ICTs and associated technological artefacts.

The research involved ethnographic immersion, described by Mariampolski (1999) as an exploration of the real world to learn and derive understanding of the meaning making and constructions behind communication, language, interaction, and cultural practices. The practice approach adopted some of the methods outlined by Schmidt (2018), observing linked routinous behaviours expressed by different people, seeing and learning how things are done, how things are understood and described, observing states of awareness and emotion, characterising mental activities, seeking understanding of the application of background knowledge, and characterising the demonstration of know how that underpins these behaviours at different times.

Observation took place in the wild, involving enquiries and recording events and activities while interviews with police officers and police staff as they carried out their duties took the form of informal discussions on the fly or semi structured enquiries. The ethnographic work was also semiotic, emphasising the presentation of views through detailed thick descriptions. Persistent field immersion was beneficial, providing an opportunity to seek an understanding of how risk assessments are carried out, in what contexts, what tools are used and whether they are structured, unstructured or a combination of actuarial tools and professional judgement.
Learning about the purposeful activities police officers carried out while expressing a range of behaviours and demonstrating their know how, enacting structures and practices through their use of technologies and interactions as described by Orlikowski (1992), Kuutti and Bannon (2014) and Schmidt (2018) provided insight into the practices of police officers and the perceptions they have about the effectiveness of the technologies they use. The resultant thick descriptions, narratives and expressed views including activity diagrams illustrating unique events and processes were useful for the research process. The thick descriptions were demonstrative of a meeting point between real life experiences and history embedding contextual depiction of the social relationships behind actions of participants and conveying their emotions and expressions as described by Subhadip and Banerjee (2012).

Learning about the reasons behind behaviours, knowledge and agency expressed when making decisions about incidents, events, and developments through varied individual perspectives, experiences, and knowledge about policing work as it occurred gave rise to the understanding expressed in this thesis. This enhanced understanding of practices related to risk decision making and use of information including the communication flows and use of information and communication technologies associated with evaluating and ameliorating risks and making risk decisions.

The field notes and diary provided understanding while the activity diagrams supported validation of insights in field. Furthermore, they informed the ‘methodological hybridisation’ Horlick-Jones and Rosenhead (2007) used in this research by capitalising on persistence of field immersion.

The analytical process was then pluralistic, involving thematic analysis of ethnographic insights into social processes and soft systems methodological analysis of problematic situations as elicited. This approach involved using the rich insights and the in-depth understanding and visualisation of real world scenarios in activity diagrams to improve
understanding of problematic situations. The research was extended by this pluralistic approach, promoting isolation of the views of problem owners, and informing interpretation of real-world situations (Checkland, 2000; Checkland, 2012; Checkland and Winter, 2017).

The insights presented in this thesis contribute to and exemplify the advantages of inductive interpretive approaches and the value of analytical pluralism in information systems research. The work contributes to and builds on the existing literature characterising the dynamic, large, and complex policing organisation and contextual understanding of risk decision making across operational, tactical, and strategic policing. It illustrates the procedural tangents involving information, knowledge and ICTs use when police officers and staff carry out their duties and how they rationalise and make decisions about emergent, dynamic risks in tactical, operational, and strategic scenarios.

The knowledge outlined highlights the value and importance of continued research in policing business informatics, opening up the world of policing. It gives a voice to police officers and staff who do the work explaining the job of policing and the scope of information and information systems used in policing, informing citizens, and contributing to the research community from a practice perspective and informing police leaders and policymakers of the realities of policing. Furthermore, the production of this thesis is an important and timely contribution to the field of emergent information systems research, bridging gaps in the research corpus regarding the characterisation of the people, including their interconnectedness with information, communication, knowledge, information systems and technologies, in policing environments at the participant police forces.

1.1 Research Questions

As outlined earlier in this chapter, the research concentrated on understanding how officers work with and engage with information and ICTs and how they communicate and use information and technologies to assess and predict risks and make decisions. The research
questions sought understanding of the role information, people, and technologies play in policing processes, deriving perceptions, and an understanding of behaviours and insight into relationships, working practices and cultures. Emphasis was placed on raising the voices of those who do the work and articulating what it is like to do the work by watching them, following them, and sometimes becoming ensconced in what they do as they do in various strands of policing work. Attention was given to archetypical elements such as power, politics, and policy while seeking understanding of the lived experiences of police officers and staff who carry out risk prediction and assessments, making operational, tactical, and strategic decisions which rely on information, knowledge, and ICTs.

1.1.1 Core Research Question

How do police officers understand their role with respect to ICTs when collecting, storing, and exploiting information for risk assessment and decision-making?

This question sought an understanding of police work and how police officers and staff engage with ICTs in the context of their policing duties. Answering the question involved gaining an understanding of the role of information including the impact of information and communication systems on policing activities, processes, and behaviours in the context of their risk predictions and decision making. It was anticipated that this question would also provide insight into problematic situations with regard to the use of technologies. In view of this, taking a multi-method (pluralistic) analytical approach enabled the analysis of problems using Checkland’s soft systems methodology.

1.1.2 Sub-strands

The sub questions in this research stemmed from the need to gather views from active police officers regarding their meaning making when using information and communicating about risk. This included gathering views related to exploitation and the future of information using various means including advanced technologies. An additional opportunistic sub question
was included to capture and characterise the impact of the COVID-19 pandemic on use of information and ICTs.

1.1.2.1 Sub Question a

**What are police officers’ views on the implications of information and communication in the context of risk assessment and decision-making?**

It is well established that there are strong and polarised views around police discretionary action (Pike et al., 2018), practices (Mitchell and Lewis, 2017) and cultures (Cordner, 2017; Cockcroft, 2020b). There is also increased scrutiny and pressure to embed and engage innovative information (sometimes referred to as intelligence) use and communication including ICTs on the job (HMICFRS, 2018; HMICFRS, 2022). This question focuses on illustrating and contextually explaining practices and processes related to police information and communication flows in the context of risk predictions and risk decision-making.

1.1.2.2 Sub Question b

1. How do police officers feel about the exploitation of information using technologies and algorithmic tools for risk prediction and decision-making?

Use of modern technologies in policing raises a few concerns. Contextually, ICT innovations such as machine learning, algorithms and artificial intelligence and their use in policing have been under much criticism (Bennett Moses and Chan, 2016; Bozdag, 2013; Babuta, 2018; Law Society of England and Wales, 2019). This question sought views from police officers regarding their use of technologies including innovative tools. Additionally, this question sought an understanding of police processes and practices with regard to exploitation/use of information using advanced metrics, algorithms computational probabilities and artificial

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4 See Glossary & Abbreviations – Note, police intelligence / ‘intel’ is mentioned in the context of information considered to be of value to policing activities and common way of referring to information of relevance to policing
intelligence tools based on machine learning for risk and harm predictions and risk decision making.

1.1.2.3 Sub Question c

2. What are the concerns about the future of data use for identifying, assessing, or detecting risk and making decisions from the perspectives of police officers, and how will this affect their practices?

This question focussed on understanding and characterising practices around communication, the use of information and information systems for risk predictions and decision making building on discussions by Ratcliffe (2016c) and Worden et al. (2014). It involved acquiring perspectives from police leaders and police officers, gaining an understanding of how they feel about the future of data use and the responsibilities associated with information acquisition and exploitation including management of information for policing purposes. By gaining an understanding of these, and insight into current contexts of information use, it was possible to contextualise and conceptualise relevant views and concerns regarding data use in and for policing.

1.1.2.4 Sub Question d

What impact did the global COVID-19 pandemic have on the use of information and information systems for risk predictions and decision making at the police forces?

Conducting the research during the pandemic opened up an opportunity to consider the changes to risk, harm and threats arising as a result of the pandemic as highlighted by Farrow (2020); HMICFRS (2021); NSPCC (2020). To answer this question, expressed and observed understandings of the effect of the COVID-19 pandemic on policing practices were recorded and analysed. Enquiries focussed on the impact the pandemic had on practices around
information use, communication, and ICTs in the context of risk prediction and decision-making.

1.2 Research Goals

Overall, the research project sought to achieve goals that stemmed from gaps in the existing research endeavours in relation to the participant police forces. It was also driven by the interest in producing knowledge that would be of benefit to the participant police forces.

The goals were structured around broadening contextual knowledge relevant to the research questions. The last two goals were incorporated to explore the traction of historical challenges with information use, including implications for the future. This included evaluating the implications of policy led adoption and implementation of new information and communication technologies in policing contexts.

These broad interrelated research goals outlined below were met by using two analytical methods aligned to the research paradigm, extending the scope of the research output, promoting reflexivity and enabling deeper understanding of participants views (Chamberlain et al., 2011). They include:

3. Characterising work conditions and dynamics of the policing environment where risk assessments and decision-making occur.
4. Gaining perspectives around the lived experiences of police officers and staff who do the work of frontline risk prediction/assessment and decision-making using information and communication technologies (ICTs)
5. Characterisation of behaviours, cultures and contexts in which information is collected in policing.
6. Characterisation of processes and procedures related to the use of information, communication, information systems and associated technologies in the process of risk assessments and decision-making.
7. Characterising information and knowledge cycles in the context of risk assessments and making decisions.
8. Acquiring perceptions and views about using information exploitation including the use of algorithmic tools.
9. Identification of common and shared problems related to the use of information and information systems and determination of solutions from police officers’ perspectives.
10. Eliciting collective views and perspectives to encourage co-ownership of commonly shared problems and co-creation of solutions from police officers’ perspectives.

1.3 Thesis structure

This thesis is organised into fifteen chapters. The first is this introduction to the research, research goals and research questions, including contributions to knowledge.

Chapter 2 is a review of the extant literature, noting that the research corpus relevant to police information systems and ICTs use in England and Wales is limited. In order to acknowledge broader research relevant to the goals and context of this research, a curated overview of interdisciplinary literature relevant to the topical area is also included. This includes literature that explores information, computing, and communications knowledge, and information systems in policing. Additionally, this review includes research that acknowledges and explores knowledge working, working cultures and technological innovation in the context of risk assessments and decision making in policing.

Chapter 3 introduces the research strategy and approach, including the theoretical approach taken in the research. The chapter includes a discussion of the epistemological and ontological stance and rationale for the inductive process adopted for the research.

Chapter 4 highlights the research and analysis methods, it explains the use of ethnography, detailing the pluralistic analytical approach taken with a discussion of the thematic analysis process and Checkland’s soft systems methodologies. It also includes an outline of axiological and ethical considerations and the approach taken for data collection.

Chapter 5 presents an outline of researcher praxis and reflections on fieldwork, the research, and experiential insights into the practice of researching in police organisations.
Chapters 6 presents an overview of the research settings describing the participant police forces and highlighting the links between them.

Chapters 7 through 12 present the ethnographic research insights through narratives and vignettes organised into themes and subthemes.

Chapter 13 is a presentation of the findings, following analysis using Checkland’s soft systems methodology.

Chapter 14 discusses the research insights and conceptual elicitations through reflective and critical discourse, recursively revisiting the research goals and questions.

Chapter 15 is a concluding summary of the research delivering the key knowledge contributions of the work and answers to the research questions. It also highlights the study's strengths and weaknesses, and presents considerations for future research.

The thesis concludes with a list of references.
Chapter 2: Literature review

“it is very strange, I say, that Acts of Parliament should exist prohibiting, under the severest penalties, the circulation of knowledge, and the spread of that education which they seemed to have so much at heart, Tis very strange, I repeat” Mr William Corbett in 1833 – At the commons sitting on taxes on knowledge

2.1 Introduction

This chapter includes reviews of the existing research and literature spanning the topical areas at the core of this research into policing and ICTs. It was noted that there is limited research into information and communication systems and informatics in policing, therefore, attention was given to highlighting the value of the previous research endeavours in the field of policing in England covering topical areas relevant to the context of this research. This includes literature related to information and knowledge in policing spanning computing, communications, contextually relevant research in policing organisations. It concludes with a summary of the existing literature.

2.2 Policing in England and Wales

As the most visible face of government power and a critical provider of emergency services, the police are held responsible for the reduction and management of risks and harms from crime in a variety of contexts. In the latter half of the twentieth century, Banton (1964) described policing work as broad highlighting the police organisation and its diverse functions and Punch and Naylor (1973) discussed the diversification of police work inclining toward a social service role. Others such as Shapland and Vagg (1988) and Skogan (1990) asserted that policing work involves response to non-crime matters and incidents that may give rise to crime while Reiner (1992a) surmised that policing role had evolved from peacekeeping and potential crime management to a more crime oriented role.
These contexts are relevant for understanding the interest in policing and the way policing has evolved in the last two decades given the tensions between communities and police as discussed by Osborn (1980) and Benyon (1984) including the increased demand for scrutiny; Balcioglu and Pala (2015), political influence on policing; Murphy et al., (2017) and diminishing funding (Benyon, 1984; Osborn, 1980; Balcioglu and Pala, 2015; Murphy et al., 2017).

The tensions motivated a demand for more accountability and transparency (Barber, 2022; HMICFRS, 2022) motivating police deferment to technologies and practice led research (Lumsden and Goode, 2018) to bridge political legislative, and social demands (Ariel, 2019). Today, police continue to be faced with challenges due to transformative and global shifts necessitating the need to develop means of managing cultural, social, economic and political pressures including continued improvements to police technologies (Reiner, 1992b; Barber, 2022).

Although existing research endeavours acknowledge the continued diversification of police work in modern work times, those that highlight concerns have limited generalisability. Additionally, few venture into detailed explanations that highlight various police staff and police officer duties and roles in the context of communication, use of information and information and communication technologies (ICTs). This research seeks to contribute to the necessary contextual understanding of who the police are and what they do, building on previous research endeavours to provide knowledge that informs continued research and improving current understanding of today's policing.

2.2.1 Risk management and Decision making in policing

Risk awareness and risk assessment are at the core of policing work according to College of Policing (2016) alongside management and decision-making in policing as discussed by Ericson and Haggerty (1997). Often described as the ‘bread and butter’ of policing, risk
decision making constitutes the basis for resource allocations as discussed by Ratcliffe (2016c), and risk response management (Perez Trujillo and Ross, 2008). Police interactions with citizens are therefore underscored by risk decision making in what is described by Bishop (2015) as the intangible art of ‘getting it right’.

It is known that risk predictions and decision-making processes are carried out in other public service sectors, such as in social care for the assessment of risk related to the welfare of vulnerable citizens (Mitchell and Glendinning, 2008; Broadhurst et al., 2010) and in healthcare and public health to ameliorate and manage risk to health, safety and wellbeing (Doyle and Dolan, 2002; Bennett et al., 2010; MacKenzie Bryners and van Teijlingen, 2010). Risk decision making is also relevant to local councils for assessing potential risks of projects (Kliem and Ludin, 2019), in construction (Akintoye and MacLeod, 1997; Shang et al., 2005), and for evaluation of business opportunities and or activities (Straub and Wieike, 1998; Power, 2004).

In policing work however, risk prediction, risk assessment and decision-making processes and procedures differ from that of other industries, drawing parallels instead with the risk assessment/prediction approaches taken in other areas of emergency response services in England and Wales (HMICFRS, 2016). With the preservation of life, preventing harm to the public and protecting the vulnerable at the core of their purposes/goals, emergency response services take approaches structured around the inherent dynamism of their work (being that no two emergencies are the same). Rather than remaining somewhat impersonal (involving measured and detached intentions) or focussed on arbitrary compliance and or delimitation of loss or liability their work involves the reduction of risk and amelioration of harm in processes that incorporate legislation and approved processes, tactics and practices (JESIP, 2021).
Within the ambulance service, risk prediction and decision-making enable the evaluation of health risks and treatment plans indicated by symptoms (O’Hara et al., 2014; Tollinton et al., 2020). In the fire service, risk prediction and decision-making support the elucidation and prognostication of danger and harm, enabling safe and effective firefighting and rescue activities (Tissington and Flin, 2005; Clarke and Miles, 2012). Collectively, the police, ambulance, fire and rescue emergency services are also tasked with working together in incidents that require all of their specialised services, harnessing their shared goals for joint emergency services planning and implementation (Wankhade and Murphy, 2012).

Police risk predictions and risk decision-making processes are time and task critical (Oswald et al., 2018; Stoneman et al., 2019; Kebbell, 2019). Processes relevant for police risk decision making are also highly dependent on information, communication (Myhill and Kohl, 2016; Oswald et al., 2018; Heaton and Tong, 2022), and the use of information and communication technologies (ICTs) and technological artefacts to facilitate/support the work (Ratcliffe, 2016c).

Police risk predictions and decision-making build on the ten principles of risk assessments (College of Policing, 2016) aligned with policing codes of conduct, (Home Office, 2011a; Worden et al., 2014; College of Policing, 2014). Associated procedures engage with risk models such as the threat, harm, risk model (THRIVE) to guide decisions related to police response (Lyall, 2017). Other tools such as the domestic abuse, stalking and harassment and honour based violence risk assessment model (DASH) are also used in domestic violence incidents (Robinson et al., 2016).

Within this, there is pressure for police to embrace innovation and engage in lean practices (Barton, 2013a; Rodgers et al., 2019), achieve efficiency (accomplishing goals competently with the least waste of effort, time and resources and managing plans and demands for the future) and demonstrate efficaciousness (producing desired results and achieving
effectiveness) (HMIC, 2015; HMICFRS, 2022). This includes improving police legitimacy (Worden and McLean, 2017) including practices around information use and information systems (Barton, 2013a; Rodgers et al., 2019).

Risk prediction and risk assessment for practical and strategic policing therefore depend upon appropriate interpretation and application of the national decision model (NDM) (James, 2013) in tandem with the application of the national intelligence model (NIM) (as embedded practices using structures to manage the use and management of intelligence) (John and Maguire, 2003; John and Maguire, 2004; John and Maguire, 2007). The functional engagement with NDM and NIM work enables intelligence led approaches, typically supported by analytical 3i and 4i frameworks (Poe et al., 2021) supporting the implementation of the intelligence led policing (ILP) model (as a strategic approach) (Ratcliffe, 2010) and associated operational policing approaches in each police force’s business model.

This is not without complexities such as those highlighted by Roycroft (2019) who highlights importance of contextual management of information and the implications of risk aversion given the complex situational, environmental, legal, organisational, and political aspects of human decision making processes in policing. Burcher and Whelan (2019) also assert that successful ILP is impeded by information overload, poor data quality such as incomplete and or incorrect data exacerbated by information sharing limitations between departments internally and other external government agencies who could supplement their local data including limited understanding of how intelligence is produced and what constitutes intelligence from an analytical perspective.

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5 The 3-i model relates to interpretation of crime statistics and intelligence on crime by police data analysts in order to provide critical decision-making support information to influence decision makers in police forces. It refers to the three components of crime intelligence analysis (interpret influence, and impact). Three components that explain the role of the crime intelligence analysts, decision makers and criminal environment

6 The 4-i model (intent, interpret, influence and impact) is helpful in explaining the roles and the relationship between key actors of the concept behind intelligence led policing (ILP). The abbreviation refers to: the criminal environment, the criminal intelligence analyst, and the police decision-maker.
According to John and Maguire (2003) and Maguire and John (2006), intelligence led policing is limited by change resistance and associated working cultures, sustained aloofness to analytical evidence, poor coordination and misalignment of goals and purposes. Other scholars have also highlighted concerns with ILP such as adverse information sharing practices (Sheptycki, 2004; Stainer, 2013) diverse and limited understanding of intelligence analysis in policing Cope (2004), change resistive cultures (Chan, 1997; Belur and Johnson, 2016; Burcher and Whelan, 2019); and leadership limitations (James, 2013; Darroch and Mazerolle, 2013). Maguire and John (2006) also highlight conflicts between local and national priorities, preoccupation with performance indicators, over reliance on police generated information and limited input from partners. They argue that large knowledge gaps exist in policing given the dislike of ILP’s academic structure and language. This they assert is compounded by a lack of understanding and awareness of the nature and purpose of police intelligence models. They further argue that these problems are the result of variations in strategic assessments, lack of standardisation and inherent police cultures that enable working silos leading to police forces developing their ‘own way’ of doing things. Some these concerns have persevered into present times as discussed by Babuta (2017), Burcher and Whelan (2019) and Cockcroft (2020b).

The research endeavours that characterise practices around the use of policing models such as the NDM, NIM and ILP provide limited contextualisation of the use of information in policing. Those that exist have limited generalisability and depth given their focus on limited areas of police work. This research therefore sought to improve the existing research into the context of information use and information systems, seeking to highlight the contextual applicability of these models by highlighting the information and communication interdependencies that inform policing risk prediction and decision making in diverse roles.
2.2.2 Policing organisation, practices, and culture

Organisational studies of policing practices necessitate an understanding and consideration of the presence of ‘working cultures’ stemming from diverse organisational research fields. Given the interconnectedness and uniqueness of individuals in complex human activity systems and the merging of varied cultures, beliefs and value systems that individuals have (Starbuck and Nystrom, 1981), individuals in organisations undergo transitions, adjustments, adaptations and shifts as they adapt to the ‘culture’ of the workplace and assimilate various subcultures (Hofstede, 1998). These adaptations are also subject to power and information imbalances which can predicate variations in opinions and subcultures influencing the negotiation of behaviours and problems in organisations (Brett, 2000).

In defining police culture, Waddington (1999); Waddington (2012) and Cockcroft (2020b) present insightful discussions and acknowledge the inter/multi-disciplinary variations in commentaries the sociological contributions such as that have given rise to understandings of police/cop cultures. Scholars such as Chan (1997) argue that understanding police culture and changing it requires recognition of police agency including the context of their socially constructed practices and the variation between police forces noting the role played by society and political influence. Others have argued that police working culture is a functional necessity (Reiner, 1992a) persistently structured and restructured by the nature of policing work (Skolnick, 2011), representative of the collective agency of police officers as they navigate and engage in sensemaking (Skolnick, 2011) and reflective of police officers seeking to understand and legitimise individual and collective behaviours in their work (Manning, 1989; Reiner, 1992a).

The concept of police occupational culture could then be said to be predicated by the socially constructed world they operate in (Chan, 1997) laden with pressures to make risk led decisions in dangerous environments by using their powers to efficiently maintain law and order (Skolnick, 2011). This culture is a reflection of shared understandings, collegial
construction and reconstruction of practices and knowledge in hierarchical environments (Chan, 1997), reflecting mutual understandings (Reiner, 1992b) that help them cope with the pressures of the job and sustain togetherness and solidarity in the throes of doing police work (Cockcroft, 2005). Furthermore, these pressures while doing police work are expressed in their collective distrust, cynicism and suspicion (Holdaway, 1980) carving out an ideological divide and emphasising cultural differences between police officers and citizens as police express ‘police culture’.

There is evidence to support the historical assertion that police are less concerned with crime detection and more focussed on maintaining social control (Brogden, 1981; Brogden, 1985; Davis, 1989). Given the ‘do something’ culture as a response to societal moral panic from political quarters and various political agendas (Springer and Richardson, 1980), police working cultures could potentially be attributed to ill-defined problems and agenda management policies (Goode and Ben-Yehuda, 1994; Cohen, 2002). This perspective is reinforced by Springer and Richardson (1980) and Cohen (2002) in their discussions regarding competing interests and conflicting goals from external political and societal quarters. They argue that policies invariably influence and impact on the outlook of those who do the work of policing.

In the same vein as Rowe (2007b) and Waddington (1999) they Springer and Richardson (1980) and Cohen (2002) assert that varied approaches to policy making inevitably influence the ways of thinking, doing and coping in policing practice. They further reinforce accounts from Brogden (1991) that those who do the work of policing are victims of the same social order that citizens, in roles that cast them as oppressors with influence and capacity to control citizens while they themselves are oppressed as a result of demands from superiors and political elite. Retroactively, the wider context of police work could then be seen by citizens as an extension of political controls in sociological contexts (Cockcroft, 2005; Cockcroft,
which extends to include the secondary influence of policy making, political exertion on the work, reforms and direction of policing (Becker, 1963; Reiner, 1992a).

Of relevance to the context of police use of information and risk decision making, Chatterton (1989) acknowledges resource drainage as a result of paperwork and discusses the potential for quality control through record keeping. He also highlights the cultural and contradictory regard for paperwork, with officers on the one hand expressing perceptions of micromanagement and control by superiors yet promoting their own ends when attaching value (largely dependent on expression of agency and subcultures) to recording information. Additionally, Stainer (2013) discusses complex information sharing problems in the context of competencies, maladaptive technical infrastructure, legal bureaucracy and organisational sub-cultures in his revision of Sheptyki’s 2004 lexicons of information sharing. These he argues sustain the practices previously highlighted by John and Maguire (2003) and Maguire and John (2006), such as risk aversion practices, working silos and maladaptive responses to conflicting goals.

Pearson and Rowe (2020a) also contribute to the arguments Chatterton and Stainer present regarding information use by explaining the influence of police discretionary use of powers on operational streamlining. Their arguments position working cultures as the explanation for the type of unpredictability police officers trained to work within complex frameworks express when they respond to information and technologies. Additionally, Paoline et al. (2006) assert that working cultures influence and shape police intelligent information processes and reformative or innovative adoptions of innovative technologies.

Given the paucity or research into policing in the field of computing and communications in England and Wales, it was relevant to enquire about collective police practices, reactions to change, reform and continuous improvement regarding information use, communication

7 Noting here that although the ‘police pocketbook’ remains highly relevant for police officers, core policing paperwork has evolved beyond paper forms and filing cabinets, superseded by the use of a range of information systems, computers, and databases to record and store data representative of innovation
practices and innovative interventions involving information and communication technologies.

This research considers the exposition of the reaches of police occupational culture by Cockcroft (2020a) by exploring the relevance and expression of this in operational and strategic policing. In particular, drawing on the historical arguments made by as Punch (1983) regarding the need to gain contextual understand of police processes and Cockcroft’s advocacy for flexibility and objectivity when considering and conceptualising police culture, this research sought a deeper understanding of contexts of cultural orientation of relevance to the research goals.

2.3 Information, communication, and policing

Information is the basis of decision making in policing supporting fundamental decisions Hoey (1998). Manning (1982) describes policing as ‘information dependent’, (where the primary information sources are members of the public). The use of this information is relevant to the success of intelligence led policing models (Custers and Vergouw, 2015; Ratcliffe, 2016b; Ratcliffe, 2010) creating significant opportunities for data use and exploitation (Howson, 2014; Babuta and Oswald, 2019). Gottschalk (2006) and (2009b) further argues that information and information analysis are critical for decision making and police knowledge management. This is resonated by the College of Policing (2016) who highlight the importance of information for anticipating risks, managing threats and making decisions that sustain police integrity and accountability.

Police risk prediction and decision making is also described as a critical aspect of policing, integral to the protection of citizens from harm by Lyall (2017) while Stoneman et al. (2019) highlight the synergy between expertise through practice knowledge and robust organisational knowledge in police decision making. Other scholars have also explored the context and value of information in policing including Hughes and Jackson (2004) who
discuss the police need for timely, up-to-date, and accurate information alongside the political and social issues that influence knowledge management in policing. They assert that police information is unstructured and acquired from tacit sources as a result of contact with citizens. They also argue that investment in skilled workers is critical to overcoming the limited recognition of the expert role of police officers as knowledge creators and agents in the conversion of information to knowledge in policing including realising the benefits of the big data generated as a consequence of their role.

The context of technology implementations in policing is also discussed by Bekkers and Homburg, 2005. They emphasise the socialised and situational aspects of information use and the influence of these on the construction of values and interests. They also highlight the horizontal transformation of meaning in the context of technology implementations and assert that information undergoes transformations during transmission that influence meaning making, human actions and activities. Taking another perspective, Rogers and Scally (2018) and Bellamy and Taylor (1996) refer to information as a material resource capable of creating power dependencies between criminal justice agencies. They assert that the need to achieve operational savings and improved efficiency have driven uptake of ICTs improving information flows and adoption of computer networks fundamental for the creation of information networks and elimination of outdated practices. Hauck, et al., 2002 further argue that this use of data and technology in policing requires humans (and their varied social identities and perceptions including power shifts and adverse working cultures filter into practice (Paoline et al., 2006; Bradford, 2012; Babuta, 2018; Hirschheim et al., 1995).

Beyond this, Manning (1982) discusses the emotive and expressive practices expressed by the police in his exploration of the relationships between the police organisation, information, and technology, drawing attention to temporal and spatial interactions between people. He characterises the communications in policing organisations into three broad
segments, explaining the situatedness of the social reproduction of shared understandings in relation to volume of information, occupational culture, and roles. In his criticism of the symbolic interactionist perspective, he emphasises the importance of accounting for the transactional relations and structures attributable to technological artefacts and conceptualises communication and information flows within a British police force, describing a ‘people processing agency’, where police self reflectively reorder events and meanings around them within the constraints of their location and role while conducting multiple tasks involving complex information flows and decision-making points.

He sets out key concepts for distinguishing types of organisations by the context of their work and use of technologies which are reinforced by Heracleous (2011) who draws on Ashby’s law of requisite variety, to advance four interpretive propositions. The propositions reinforce the view that an organisation is comprised of variable components such as communication and use of information and technologies. Aligning with (Manning, 1982) and Manning (1988), Heracleous discusses situated drama, asserting the importance of integrative communication research to promote interrelated analysis of police information.

Ericson and Haggerty (1997) also contribute to the discourse arguing that enacting knowledge work rules that force compliance with police processes and procedures increase workloads and sustain enclosure and certainty in police actions and thinking. They assert that accountability demands increase bureaucratic burdens, regulating and constraining communication formats in what they describe as ‘scientized’ policing with fixed choice and ‘bootleg’ reporting formats.

Although the literature advances characterisations of police work in the context of information use, there is still limited understanding of the proponents of police information

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8 Although Ericson and Haggerty (1997) refer to ‘bootleg’ forms (in referring to a paper based system) as “forms created by police divisions or units without central authorization” in order to either recognize them officially or eradicate them from the knowledge system,” the use term ‘bootleg’ here is interpreted in the modern (digital) context and seen as the use of ‘work arounds’ or deferment to non-official practices to improve, avoid or compensate for rigidity of fixed response formats in existing information systems.
and communication practices. Furthermore, some of the existing research characterises a mix of paper based and semi-digitised approaches to information use, knowledge management and communication practices. This research built on these explorations, noting the limited currency of existing knowledge and advancing characterisations and explanations for the context of information use, and use of information systems providing insights into information and communication cycles that embed information systems use in 21st century policing.

2.3.1 Information, Information systems and ICTs in policing

Technologies and information and communication technologies have gradually taken a prominent role in enabling the management of police information and communication with bespoke systems evolving over time to meet increasingly complicated needs (Barber, 2022). The possibilities for ICTs in policing have gradually increased in recent years alongside the fast paced demand for innovative solutions that engage with advanced technologies (Custers and Vergouw, 2015). Additionally, the increasing diversification of policing work (Hughes and Jackson, 2004; Bell et al., 2016) has also increased their need for specialised technologies that support legislative and procedural needs and align with procedural requirements (Sandhu and Fussey, 2020; Innes and Graef, 2021; Barber, 2022).

Police use of technologies is widely acknowledged by Hough (1980) who characterises policing work and the impact of ICTs on police resource management alongside problems such as mismatches between the capabilities of technologies and police administration requirements, data quality issues, implementation problems related to working cultures, low prioritisation of resource administration. He argues that technologies that are structured around the administrative model of policing as articulated by Manning (1977) are misaligned with task/goal/role differentiation and the concept of productivity given the existence of multiple objectives within policing.
Subsequent explorations of police adoption of technologies are however described as slow but gradual, by Ackroyd et al. (1992) and complicated by procurement practices and limited by funding according to Custers and Vergouw (2015). Despite these cynical characterisations, Chan (2001a) discusses the positive influence of technology use in policing, such as improved efficacy, improved performance and accountability while others such as Custers and Vergouw (2015), Deflem (2009), Rogers and Scally (2018) and Schellenberg (1997) highlight the benefits of ICTs in policing as a means of managing information to meet increasingly complicated needs.

Scholars such as Ackroyd et al. (1992) emphasise the highly changeable police environment influenced by crime patterns, policies, and people in their discussion about the various ways technologies have been implemented in policing. They further highlight the value of their interpretive enquiries into the socialised process of ICTs adoption and implementation in policing in their discussion of various social factors arising as a result of technology use in policing such as corruption, misconduct, and diminished legitimacy. Of relevance, they propose a framework for ICT development and discuss the factors that affect use and uptake such as variation in tasks given the dynamic nature of police work, limitations to generalisability of value i.e. the one size fits all approach and the implications of social restructuring of technologies (Ackroyd et al., 1992).

Technologies should (in principle) serve the primary function of promoting a structured, auditable, and transparent means of managing information and knowledge with attention to the dynamic and specialist type of risk assessment, risk prediction, and decision-making policing involved (Home Office, 2011b; Babuta, 2017). It is understood that technologies are morally significant, disruptive, and unpredictable with the capacity to reshape human activities, creating new worlds and cultures (Kling, 2000; Kappos et al., 2005; Hassan et al., 2018) and predisposed to challenges attributable to internal and external political, financial, and structural problems (Davies, 2000; Custers and Vergouw, 2015).
Although there are many technological tools in use and or available for use in policing, such as the police national computer (PNC) (Ackroyd et al., 1992) and a range of information systems and databases (Custers and Vergouw, 2015; Allen et al., 2017), the dynamism of policing and the need to seek economical solutions (Jenkins et al., 2011), harness innovative advances (Ariel, 2019) and remain compliant with legislative, ethical and reformative practices (Hildebrandt, 2018; Rovatsos et al., 2019) sustains mutable needs that are subject to bureaucracy (LGA, 2020; CMA, 2020). It is also acknowledged that newer technologies afford policing the option of data warehousing, information storage and computations, data recovery, data access, imaging, and predictive tools (Clowes, 2004; Skogan and Hartnett, 2005a; Hoey and Topping, 2010; NPIA and ACPO, 2010). They also enable and support the management of emergent crime and harm.

In addition to this, the interlacement of responsibilities and the need for appropriate joint coordination of emergency service responses places additional statutory information and knowledge management demands on police forces (Felgueiras et al., 2019; JESIP, 2021) which requires continued investment and improvement of relevant ICTs. (HMICFRS, 2022; Barber, 2022). However, this must be considered alongside discussions by Radovan (2013) who argues that transformation of socialisation, relationships, work and working practices influences the technological features organisations and people choose. He asserts that functional technological unification enables connectedness providing opportunities for person-to-person collaboration, interaction, and communication, but these are influenced power shifts, systems within systems, imbalances in constructive relationships and uneven distribution (Radovan, 2013).

The gaps in the existing literature span two contexts. In the first, organisational information systems research that explores the CSCW contexts of policing are sparse. In the second context, the research that exists is representative of a growing body of organisational research in policing however the literature is limited in currency and heavily focussed on
sociological contexts. It was therefore relevant for this research to explore the computer supported cooperative working contexts at the participant organisations, enabling understanding of the interactions between people and technologies in collaborative and complex work environments and improve their digital capabilities including how these reshape work practices as described by Kumar and Dell (2018b).

### 2.3.2 Police knowledge management

Police officers take on an understated role as knowledge workers, gleaning, using, managing, transferring, and processing information in the process of building community relations and discharging their duty (Gottschalk, 2006; Reicher et al., 2007; Birdi et al., 2011). Scholars such as Nonaka have previously described knowledge management in contexts relevant to policing, acknowledging the complex process of communicating, storing, and transforming tacit and non-tacit/explicit knowledge into organisational knowledge that informs processes.

Additionally, others have highlighted the importance of integrating relevant and useful information and communication technologies into knowledge management processes with a view to enhancing organisational value and business processes such as Bider and Jalali (2014). Furthermore, Scholars such as Schellenberg (1997); Chan (2001b); Cope (2004); Skogan and Hartnett (2005b); Allen et al. (2008); Gottschalk (2009a), have elaborated on the vast amount of information that police officers collect in routine policing from day to day Poe et al. (2021) outline a taxonomic differentiation between intelligence management and knowledge management in policing. They describe knowledge management as the management of “know how”, and intelligence management as technology driven “know what” restricted to the management of structured and unstructured facts and information that is explicit and well defined (Poe et al., 2021).

There are however, some complexities associated with these due to the dynamism of policing work and types of tools available to police officers for this purpose (Skogan and Hartnett,
2005a; Hoey and Topping, 2010) with some scholars highlighting the lack of resources and tools with which to generate insights by interrogating or mining the information quickly, reliably or accurately (Babuta, 2017). These issues have potential to subvert the perceived and actual usefulness of data, knowledge, and information in the long term (Caudle et al., 1991a; Ratcliffe, 2003; Reiner, 2007; Caplan et al., 2018).

Furthermore, Brown and Brudney (2003) note that effective decision making is enhanced when the role of the knowledge worker is harnessed as this promotes goal driven activity and stimulates effectiveness and performance in police officers whilst Oliver and Roos (2005) and Baldini (2010) assert that proactive information sharing in highly dynamic organisations support better collaborations and aid quicker decisions. Thoughtful informal interactions (Hoey and Topping, 2010) are a vital key to supporting better interpersonal skills, creating an environment of supported accountability heterogenous organisations and improving risk assessment and decision making skills (Ackerman et al., 2003). This social interaction between police officers improves information and knowledge exchange supporting formal and informal interaction that promotes knowledge culture and efficiency (Lindsay et al., 2009).

Knowledge management is influenced by the adequacy of interdependencies including relevant control and execution of knowledge worker roles to ensure the sustainability of interpersonal knowledge transfer in policing (Alain 2010; Griffiths et al., 2016). Furthermore, Disterer (2001) highlights some of the difficulties that impede knowledge management and transfer in organisations such as loss of power, low motivation, uncertainty, value attribution to revelations, lack of a common language and conflict avoidance. In the case of policing the value and implications of intertwined cultures, processes and systems in the process of knowledge management and transfer are clearly important (Paoline et al., 2006; LeFebvre and Franke, 2013) despite the potential for adoption of technologies to reduce social interaction as police officers increasingly work in isolation (Chan, 2001a).
While these insights set out understandings of police knowledge management, gaps remain in the research regarding police work, subcultures, realities, motivations perceptions (which this research explored) and enquiries that highlight knowledge management are socio centric. Seeking insights around the information and communication cycles related to construction of police knowledge therefore contributed to contextual understanding of relevant meanings in various police workstreams related to police knowledge and organisational memory enhancing insight into the police organisation.

2.3.3 Organisational knowledge in policing

Police business cases are underpinned by the scope and capacity for the police forces to engage with ICTs to support adequate crime, risk, and threat analysis including relevant decision making (Ratcliffe, 2003). The intelligence led policing approach structured around the national intelligence model (NIM) is at the core of strategic policing and embraced widely by all police forces in England and Wales (Ratcliffe, 2016a). NIM provides a framework for the use of structured analytical processes to maintain an evidence based approach to the management of diverse priorities and business processes in policing (Maguire and John, 2006).

The introduction of intelligence led policing enabled a shift toward structured analysis of crime intelligence supporting deployment of preventative crime fighting tactics, improved community policing and better investigative tools using ICTs to enhance methods of crime management (Ratcliffe and Guidetti, 2008). It was structured to enable deployment of police resources based on data and statistics of crime for that area (Ratcliffe, 2008; Ratcliffe, 2011) directing resources toward prevention and interception of crime based on analysis of crime trends, crime patterns and criminal activities. However, although more likely to be contrived as electronic, as at 2018 significant amounts of police data analysis was still conducted by hand, delaying and limiting the efficacy of the statistics generated (Babuta et al., 2018).
Police ILPs are highly dependent on the scope and capacity for the police force to engage with ICTs to support adequate crime, risk, and threat analysis including relevant decision making (Ratcliffe, 2003; James, 2013). The use and exploitation of data and knowledge for human decision making including relevant information systems are therefore relevant to risk predictions and risk decision making in policing as highlighted by scholars such as Caudle et al. (1991b); Hoey (1998); Chan (2001b); Manning (2003); Clowes (2004); Skogan and Hartnett (2005a); Cordella and Iannacci (2010) and Allen et al. (2014).

There are inherent problems with the incorporation of the national intelligence model and the intelligence led policing approach by police forces as indicated by Belur and Johnson (2016) and James (2013). They highlight the difficulties that exist between the use of analytics, the work that analysts do and the expectations and understanding of analytics by the police including limited resources and funding. Policing continues to transition from paper to digital systems (Babuta, 2017) and this remains subject to political, social, cultural and economic influences (Custers and Vergouw, 2015) with limited understanding of reasons for this expressed within the existing literature.

As an information dependent public service, most of the information that is used in policing comes from citizens and or is acquired through community policing activities. Understanding how police forces acquire, record, store, process and use information is a vital part of understanding their policing activities and decisions. Furthermore, contextual understanding of internal and external influences on uptake and use of information and information systems is central to understanding the enactment of knowledge, and organisational memory, including the influence this has on intelligence led approaches. It was then relevant to explore and understand these contexts to promote understanding, enhance the existing knowledge about information and information systems use in the context of risk decision making predicated on intelligence led approaches in policing.
2.4 Risk Decision making & Technological Innovation in Policing

From the late 18th century through to the mid-19th century criminal record keeping underwent significant intensification (Shoemaker and Ward, 2016). The dedicated acquisition and emergence of data exploitation in this period marked what Higgs (2004) described as the emergence of the ‘information state’ while Giddens (1995) described it as elite motivated governance and control. Although scholars such as (Eastwood, 1989) assert that this drift toward datafication was a result of the functional need to understand criminals and enforce criminal justice, while others such as Slack (2004) and Donnelly (1998) argue that the inclination toward datafication was the result of ‘political arithmetic’ and ‘moral statistics’ due to the emergence of a culture of dependence on empirical data and positivistic facts (Poovey, 1998). Additionally, other scholars such as Garland (1997) and O'Malley (2010) argue that this emergence of datafication created a means of exercising disciplinary power with potential to stigmatise in the context of the governmentality theory by Foucault (1979).

By the turn of the 21st century, it became evident that the use of large amounts of data and technology in policing is not an exact or singular use entity; it requires humans to make it work (Hauck, et al., 2002). Additionally, the use of information systems and technologies in policing is not without its problems Stainer (2013); Birchard (2004) because police decision making relies on information collected from humans with varied social identities, perceptions and discretion levels and this occurs within a workforce where elements of their working culture and belief systems filter into practice (Paoline et al., 2006; Bradford, 2012; Babuta, 2018).

In their extensive discourse regarding police street powers Pearson and Rowe (2020a) highlight the role of cultures that shape risk decision making in operational contexts. They highlight arguments by Jefferson and Grimshaw (1984) that the effectiveness of operational policies are limited by discretionary freedoms which take precedence over the source (organisational, legislative or political) of the powers police have. Juxtaposed against
insights from scholars such as Dencik et al. (2016) who assert that the current pervasion of technologies in criminal justice incline toward surveillance capitalism and Feenberg (2004) who argues rigorously for recognition of the same as hegemonically designed technology that requires democratic rationalisation, it became evident that there is a need to understand the way algorithms are used in policing in England.

The widespread use of data exploitation tools in global contexts Bachner (2013), Perry et al. (2013) and calls for the same in England Kearns and Muir (2019) was of particular importance to this research, because police information, data, intelligence and knowledge is shaped by the prevailing practices, cultures and the individual and collective discretionary practices discussed by Pearson and Rowe (2020a) and Meijer et al. (2021). Of note, algorithmic tools rely on the veracity and validity of decisions expressed in data and intelligence recorded in large volumes over time to support identification, prediction and risk decision making related to people, places, and artefacts (things) (Travaini et al., 2022). This includes using frequency of offending to predict predisposition to recidivism and frequency of specific location response to predict recurrence and risk of incidences of crime or harm as outlined by Perry et al. (2013) and Hälterlein (2021). But what do those who do the work think of this?

The tools used for decision making and decision support systems in policing at Bedfordshire, Hertfordshire and Cambridgeshire are not characterised in the existing literature. Although the existing literature outlines a range of applications of organisational knowledge extending to various characterisations of the role of people and technologies, they express limited specificity. Current research efforts are also limited in their conceptualisations and contextual characterisations of police practices with respect to the use of information, communication, and data-information-knowledge cycles. Furthermore, there is paucity of research into socially constructed perspectives of those who do the work and limited understanding of how the situate algorithmic data exploitation in the context of their work.
This research was therefore focussed on increasing understanding of police processes from an information systems perspective. It explores the context of organisational knowledge and the ways in which information and knowledge is acquired, communicated, and transformed contributing to the understanding of the links between police officers meaning making and practices with respect to information use and exploitation including knowledge management.

2.4.1 Datafication in policing

In the face of diminished funding the drift to technologies as a means of achieving savings by public services has risen. Contemporary lifestyles have also promoted a surge in the volume of data shared out of necessity or voluntarily contributed to digital portals and open social networks (Woetzel et al., 2018). This driven a move to extensive digitisation of citizen data, technological self-servicing facilities and exploitation of data by public services (Cordella and Iannacci, 2010; De Guzman and Jones, 2012; Davis, 2015). As discussed previously, although the datafication age is indicative of progress and advancement, relevant concerns have been raised such as imbalances in power-state-citizen relations (Johnson, 2014) and increased level of security risks. Other issues related to data justice including bias, discrimination and data mismanagement have also been discussed by other scholars (Cinnamon, 2017; Eubanks, 2018; Dencik et al., 2018).

Given these concerns and the limited exploration of police views of datafication and data exploitation, it was considered relevant to enquire about police views regarding datafication and data exploitation.

2.4.2 Big data and policing

The data collected and stored on a day-to-day basis in policing activity presents police forces with what could be considered a significant resource. Agencies such as the Home Office and National Crime Agency (2019) and HMICFRS (2020a) assert that the exploitation of data is
important for policing as they strive to increase their efficacy and efficiency to realise savings targets and do more with less. However the exploitation of police big data comes with a measure of responsibility and risk (Babuta, 2018). When decision making relies on information collected from humans with varied social identities and perceptions and on human judgement within a workforce trained to work within a set of frameworks there is an element of unpredictability. Invariably, despite using intelligent information processes and systems, elements of working culture and belief systems may filter into practice (Paoline et al., 2006; Bradford, 2012; Babuta, 2018).

Additionally, according to Cherry and List (2002), Ioimo et al. (2009) and Brantingham et al. (2018) historical practices, data errors, biases and the evolution of legislation and crime pathways complicate the reliability of decisions predicated on algorithmic computations in policing. Decision makers who harness automation/algorithms may therefore be faced with difficulties in challenging algorithmically generated outcomes or solutions and in high-risk situations, they could find themselves disempowered and fearful given the blame culture synonymous with criticisms of policing (Meijer and Wessels, 2019; Heaton and Tong, 2022).

Beyond this, there are concerns regarding suitability such as the discussion by (Oatley et al., 2006) who report on data mining of home burglaries noting that the applicability of data mining and artificial intelligence in other policing areas may be difficult to model. Overall, the existing literature highlights the possible implications of using flawed data for machine learning and artificial intelligence, in particular, it is evident that exploitation of data that exemplifies prejudice supports a continuation of prejudicial strands and cultures within law enforcement (Caplan et al., 2018; NASEM, 2018). Given these insights, it was of value to enquire and gather police views about the current data exploitation practices and their views on the future of data exploitation in their work.
2.4.3 Predictive policing methods

It has become evident that the exploitation of data using technology is central and critical to policing goals as they strive to increase their efficacy and efficiency to realise savings targets and do more with less (Maguire, 2014; Barber, 2022). However the use of information proprietary or peripheral, within legal parameters comes with a measure of responsibility and risk (Babuta, 2018). Given these concerns, the development of information management policies and tools for policing may require more consideration of work practices, heterogeneity of roles, coordination, rules, and procedures (Innes and Sheptycki, 2004; Koper et al., 2014)

2.4.3.1 Predpol

In recent times, reports surrounding the use of facial recognition tools have received attention and criticism due to concerns about privacy, data justice, efficacy and fairness (Kitchin, 2016; Gal, 2017). While use of Predpol has been lauded and engaged actively and widely in the USA (Wang, 2007; Bachner, 2013) it was adopted then abandoned by in Surrey police after high levels of expenditure due to its impractical demands on resources Kent Police (2013).

The dominant predictive policing tool (Predpol) used in the USA was developed using an epidemic type aftershock model (ETAS) Mohler et al. (2011); Mohler (2015) based on a reaction diffusion model Mohler et al. (2015). It simulates an algorithmic crime triangle response to crime based on place-based policing approaches. Crime hotspots are modelled using equations that mimic those used to model chemical reactions that give rise to earthquake occurrences (Wong, 2022) Other algorithmic tools have also become ingrained in policing across borders and for profiling (Ferguson, 2012; Bennett Moses and Chan, 2016; Babuta, 2018; Rhue, 2018).

The Predpol hardware and software component flow illustrated in the figure below, is based on an algorithmic reaction diffusion model that deploys resources in response to predictions
from discrete or continuous data mining models. It substitutes likelihood of the presence of chemical reactions and a disaster occurring based on the ETAS model with motivated offenders, victims, crime information graphs, geolocation, and the likelihood of crime. Police presence (hotspot policing) is viewed as the inhibitor to activation of a motivated offender in environments defined by boundary conditions.

![Image of exemplary hardware and software components used in the Predpol system (Mohler, 2015)](image)

**Figure 1**: Image of exemplary hardware and software components used in the Predpol system (Mohler, 2015)

The algorithmic predictions estimate long and short-term hotspots on the basis of a continuous time, discrete space epidemic type aftershock sequence point process. Point processes are determined by evaluating the relative contribution initial/core and dynamics features of a shock(crime) including subsequent aftershocks (ripple effect), then computing risk using an expectation maximisation algorithm. This approach prescriptively recommends placement of police officers in defined box locations where they might intervene or interrupt an “aftershock”.

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The discrete model evaluates geolocations for feasibility (from the viewpoint of a motivated offender) on the basis of risk of victimisation (information offenders have about the victim and location-based vulnerability) and attractiveness to offenders (based on environmental cues). The risk of victimisation is calculated as a dynamic variable depending on whether the location or person/s at the location victims has before (indicating increased risk of revictimization and frequency of crime) and mining extant location and victim crime history to evaluate/compute the “broken windows” effect (risk of attack or re/victimisation spreading to near neighbours).

Using a biased random probability mining approach, a simulation of how often an offender/criminal agent might attempt to commit crime in a given location over time is computed based on the equations for these variables. Then the mined historical data is used to model and predict locations with strong likelihood indicators for presence of a “criminal agent” prepared to commit a crime or present but likely to move to a neighbouring location to commit a crime.

The second, continuous model utilises a similar approach as the discrete model however unlike the discrete model, the simulation includes differential calculations that include calculations for density of criminal agents based on mined data and the variable likelihood they will migrate from one hotspot location where intervention is present to another location where they anticipate lack of guardianship (police presence). The simulation is then used to predict the likelihood that criminal agents will be found at a specified location either because they are seeking alternative (different) opportunities and or because the density of offenders in one location is such that there is a high likelihood they will migrate and populate another location in the absence of opportunities/face of limited opportunities.

Beyond this, the account by Ferguson (2012) touches on the various aspects of predictive policing including the concerns about algorithms failing to recognise that if one area becomes noted as being overpoliced, criminals can and will simply move to a new territory
and operate unhindered, additionally he highlights the short lifespan of predictions of crime, asserting that they cannot be on an “unthinking basis” for valid predictions. This highlights other salient problems which are associated with predictive tools such as validity, veracity, applicability, and value of predictions.

2.4.3.2 Evidence based investigation tool (EBIT)

The evidence based investigative tool EBIT tool developed by Cambridge university’s criminology faculty supports selective investigation of crimes using evidence-based crime statistics to predict likelihood of obtaining positive outcomes is being used in Kent and with increasing use by other police forces (Grace, 2019). It is used to support decision making from certain types of crimes under Sections 4 and 4a of the Public Order Act 1986. Section 5 of the Public Order Act 1986; Section 39 Criminal Justice Act 1988 (common assault); and section 47 Offences against the Person Act 1861 (assault occasioning actual bodily harm) excluding crimes with vulnerable victims, hate crimes and domestic abuse. The tool is not utilised by police for evaluation of crimes with vulnerable victims, hate crimes and domestic abuse. Kent police force have adopted this tool as a means of managing public order and assaults offences efficiently and to improve the quality of investigations and improve positive outcomes in other areas of policing (Kent PCC, 2018).

2.4.3.3 Harm assessment risk tool (HART)

In 2016, the harm assessment risk tool HART was implemented in Durham constabulary to help police make risk-based decisions about custodial detentions (Oswald et al., 2018). The Durham HART tool is linked to a program carried out by University of Cambridge and West Midlands police focussed on implementing out of court disposals to limit the flow of vulnerable individuals such as women into the traditional courts and justice system (Law Society of England and Wales, 2019; Coutts, 2018). The tool was created using 104, 000 historical crime records of arrests in a five-year period to create an algorithmic tool using a
random forest method that combines variables to forecast whether a person is likely to present risk to public or commit further crime if they are bailed Oswald et al. (2018)

2.4.3.4 Violent Crime Linkage System (ViCLAS)

There are a number of crime linkage analytical systems in use in policing in England such as ViCLAS, the violent crime linkage system which enables the identification of offenders who have committed multiple crimes, supporting investigation efficacy and effectiveness. The ViCLAS system was developed by the royal Canadian mounted police and is related in part to the victim apprehension program ViCAP which was developed by the federal bureau of investigation (FBI) in the United states of America (Grubin et al., 2001).

It engages a five-step process, where details from investigations about a violent crime are entered into a specified booklet, then forwarded to a quality control centre for review. Following review of the entries, the information from the booklet is entered unto a database of previously solved and unsolved crimes. This data is then analysed against the ViCLAS database, mining it to search for potentially relevant links. Once this search is complete, the investigating police officers are then informed about relevant links enabling them to attempt to confirm or eliminate the linkage by conducting further investigations.

ViCLAS also provides a means of storing data useful for enabling and managing research into serious criminal behaviours, criminal profiling and child sexual exploitation offenders with a view to understanding how crime occurs including patterns and indicators and as a basis for evidencing connectivity and factual accounting in testimonies prepared for the prosecution of criminals found culpable in criminal offences (Snook et al., 2012). There are, however, underlying concerns about the reliability and methods used for computations using ViCLAS as noted in Her Majesty’s Advocate v Young. 2013 (Grubin et al., 2001; Woodhams et al., 2018)
2.4.3.5 Gangs violence matrix

The Gangs violence Matrix uses a predictive model that exploits online, open-source intelligence (OSINT) (Grace, 2019) on the basis of (sometimes suspected) connections, links, relationships, behaviours between individuals with respect to risk of involvement and threat of harm to others as a result of drug or gang related crime, organised criminal group type delinquency and serious youth violence using what is likely to be a computation based on social network analysis using network and graph theoretical approaches (Cavallaro et al., 2021; Burcher, 2018). The exact computational methods used in the gangs matrix are not public, however the Metropolitan police force claim that the model is subjected to periodic empirical validation and deletions (MOPAC, 2018) to ensure the predictions and rankings of individuals within the matrix are proportionate and accurate.

Over time, concerns have been raised about the disproportionality their expresses given the number of young men and youths of colour retained on the database in what Grace (2019) describes as punishment management and calibration tool for people of colour. Additionally, (CDEI, 2020) describes it as a tool that functions without evidence raising concerns about bias.

The tool came under scrutiny by various agencies leading to an overhaul in 2020 (MOPAC, 2018; MOPAC, 2018.). It was also the subject of data protection concerns as a result of its reliance on historical data in the context of crime prevention. (ICO, 2018). Although there is no known use by police forces outside the metropolitan police force area, it continues to be used by the Metropolitan police force to date

2.4.3.6 Emergent Analytics tools

Over the last five years, policing has had more funding to support them in engaging technologies through the ongoing National Data Analytics Solution program. One of the programs benefiting from this is in ‘trial’ by West midlands police force where they are
using test data from West Midlands police records regarding serious violence by using modern slavery records to assess risks of co-offending as a result of relationships with persons of criminal influence.

In addition to this, they are working to use machine learning and AI to gain insights into areas of policing across seven categories, threat risk and harm management, demand management, intervention management, vulnerability identification, crime identification, organisation improvement and advanced visualisation of early intervention by generating insights for location identification, organisational health and corporate asset management, emerging crime, staff welfare and staffing, effective policing interventions, crime and precrime identification, offender identification, threat, risk and harm identification, geomapping of crime, demand management and effective resourcing, including victim and previctim identification (West Midlands Police, 2017).

Beyond this, at Avon and Somerset police, algorithmic tools are used to inform intelligence profile building. Their Qliq sense tool enables risk assessment of individuals using algorithmic modelling to produce intelligence profiles and individualised risk assessment profiles that are reviewed for relevance and accuracy periodically. Predictive modelling to produce individual risk-assessment and intelligence profiles, to assist the force in triaging offenders according to their perceived level of risk (CDEI, 2020).

The data collected and stored on a day-to-day basis in policing activity presents police forces with what could be considered a significant resource in countries where artificial intelligence has become embedded in policing and by extension the judicial system. It is evident that the benefits are far less positive than anticipated particularly because information systems that are fed with or populated with information that is fuelled by inherent biases within systems, processes, behaviours, attitudes and working cultures, translate into data that lacks intrinsic veracity (HMIC, 2014).
When potentially flawed data and inexplicable computations are used for predictive crime control, it promotes a cycle of flawed risk assessment, risk management and decision-making sustaining prejudice and deepening community alienation from police services (Caplan et al., 2018; NASEM, 2018). Further questions then arise when big data (often largely historical) is used for analytical or predictive purposes, by being mined for specific features, statistically represented, being used to model scenarios, or used as a basis for machine learning, and or artificial intelligence in policing and they are relevant questions, particularly so, in the context of risk assessments and decision making. As such, it was important to enquire about the use of data for operational predictive policing purposes.

Tools used for decision making and decision support systems in policing at Bedfordshire, Hertfordshire and Cambridgeshire are not characterised in the existing literature. Current research efforts are also limited in their conceptualisations and contextual characterisations of police practices around data, formation and knowledge exploitation including what innovative information-based systems and technologies are used for risk at the participant police forces. This research therefore sought to improve existing research in this domain by exploring information and data exploitation practices, perceptions around machine learning and algorithmic tools and concerns about the future of data use.

In conclusion, the efforts and funding being put into using harnessing existing police records to map means and ways to prevent, contain and manage future crime in England are significant. There are several concerns about the use of machine learning and algorithms in policing spanning privacy, general data protection regulations, ethical and social problems. Furthermore, little is known or reported in the literature regarding predictive tool use in England and Wales or at the participant police forces. This research therefore explored the perceptions that police officers have regarding the use of artificial intelligence enquiring
about a broad scope of layperson concepts related to or considered to be AI\textsuperscript{9}, how and if AI is in use at the participant forces from the perspectives of police officers and policing staff.

2.5 Literature review summary

Although the existing literature and scrutiny documents highlight the police organisation and associated cultures providing a basis for understanding the varied history of problems and concerns with policing, there are limited explorations of the practices and cultures related to use of information and ICTs and very few at the participant police forces. In particular, few research endeavours highlight the views and role/s of police officers with regard to exploitation of information and use of ICTs in the context of risk predictions and decision making.

The bulk of reviewed ethnographic explorations in policing have centred on the sociological, dwelling on organisational culture, performance, and legitimacy. They provide insight into a range of interventions and reformative policies related to improvement of risk prediction and decision making in policing, however there are limitations to this given the dynamic nature of policing concerns. In particular, much of the police research reviewed are products of small studies which present with the challenges of generalisability, whilst others are limited by their currency and location specificity.

Given the traction of innovation and its implications for the policing landscape and despite the assertions in existing literature regarding the need for deeper understanding of the social and technical in order to contextualise the sociological, overall, it was evident there is a paucity of research into the participant police forces. There was also limited exploration and characterisation of the use of information, information systems and related ICTs in risk assessments and decision making in policing work at the participant police forces.

\textsuperscript{9} In exploring this, enquiries included asking for views regarding intelligence exploitation, big data, computation systems, advanced metrics, machine learning, algorithms, automated decision making.
It was also evident from these that there is difficulty when negotiating ‘outsider’ ethnographic research in policing for many reasons spanning security, trust and the bureaucracy surrounding access to police forces. Some of the research endeavours reviewed inclined toward the positivistic approach given the costs, rigors, and scope to engage in persistent immersion for organisational research. The research reviewed indicated there were limited studies that take an interpretive practice approach to ethnographic inquiries into police information systems and information practices in England and Wales. Therefore, there was an evident limitation within the existing research regarding amplification of the voices of those who do the work based on persistent immersion in police forces.

Existing research efforts provided varied, sometimes conflicting characterisations and conceptualisations of the police roles regarding knowledge management, organisational memory, and practices in the context use of information and ICTs for risk predictions and decision making, albeit such efforts in England and Wales were very limited. This motivated the development of research questions that sought understanding from an organisational and cultural perspective.

In order to address limitations and contextual gaps in the existing literature and research, regarding practices and perceptions about the use of information and information systems for facilitation of risk predictions and decision-making processes. This research was deployed as a multi-sited study, seeking perspectives around the lived experiences of police officers and staff who do the work of frontline risk prediction/assessment and decision-making.

The core and ancillary questions focussed on gathering insights that characterise processes, procedures, behaviours, cultures, and contexts including work conditions and dynamics related to use of information, information systems and ICTs. This research also explored and elicited cycles of information, communication, and knowledge relevant and critical for contributing to the limited studies in this area and informing future research into various
aspects of policing and innovations involving ICTs with attention to understanding the implications of neo-liberal approaches to police policy making and the socio-technological and socio-criminological implications in the context of risk prediction and decision making.

Furthermore, this research centred on bridging gaps in existing research into cultural and organisational practices in policing by telling the stories of police officers in their day-to-day activities and sharing their views as they negotiate the flux and flow of information use, communication including engaging information systems and associated technologies in multiple contexts and roles.

By taking a pluralistic analytical approach to the inductive research process, the scope of this research was extended by gathering insights and eliciting problems, then facilitating problem solving in tandem. This approach supported identification of common and shared problems and facilitating co-ownership of commonly shared problems and co-creation of solutions related to the use of information and information systems in the process of risk assessments and decision-making from police officers’ perspectives.

This approach provided a means of on existing research into information, communication, knowledge, and ICTs related problems in policing. It also supported elicitation and creation of knowledge.

This research addresses these gaps by characterising police communication practices and information and communication flows within the police organisations. It also seeks to enhance understanding of police risk prediction and decision-making practices, improving existing research contributions in the area of police information systems, providing a basis for continued improvement of policing and policing policies.
Chapter 3: Research strategy and approach

Science must not be solipsistic. It must be valid for every experiencing subject. We would be in a nasty position indeed if empirical science were the only kind of science possible - *Husserl's inaugural lecture at Freiburg im Breisgau (1917)*

3.1 Introduction

The development of a philosophical approach is a critical guide to the selection of methods used for research. As outlined by Hassan et al. (2018) philosophical grounding is an important means of justifying approaches to research and expressing understanding of the information systems field. This process of defining a thread connecting the phenomenon being researched, the meaning and value of knowing, the ethics and feasibility and the means of delivering insights is critical for information systems research (Holden and Lynch, 2004; Wilson, 2003).

In this stead, scholars such as Hathaway (1995) have asserted that the assumptions made about reality, beliefs and knowledge influence methodology and predicate methods adopted in research reflecting the researchers’ epistemological views. Furthermore, Ponterotto (2005) discusses paradigms and frameworks for research drawing attention to the importance of locating research enquiries within identifiable paradigmatic values, practices and assumptions and Galliers (1991) discuss the importance of differentiation between methodology/approach and methods and careful selection of appropriate empirical approaches.

The structuring of the research strategy for this research included exploring and questioning different approaches, seeking to anchor the logical foundations of the research strategy. The rationality of the frame/s of enquiry and questioning was evaluated, i.e., the work of risk prediction and decision making with attention to the context of information use, communication and ICTs, people and the organisation including cogitation of ethical aspects.
of the research and research participants. This gave rise to consideration of various strategies to identify one suitable for achieving the research goals thus, providing a feasible means of answering research questions.

The philosophical approach taken in this research also considered what is ethical and of value (axiology), identifying and expressing the way truth and reality are defined., (ontology), identifying and incorporating the way truth and reality is determined , (epistemology) and establishing a methodology based on these, i.e., the process engaged to achieve this from the researcher’s perspective and incorporation of these to sustain research rigor and quality.

As indicated in chapter 1, this thesis reports on research into a multidisciplinary area of work, characterised by dynamism, complexity, and uniqueness, given the social, societal, and public nature of the policing organisation in England and Wales. This chapter therefore explains the conceptual framing, paradigm, ontological and epistemological approaches taken when doing the research. It includes a rationale of the research methodology including the theoretical perspective/lens adopted and axiology.

### 3.1.1 Research approach

In social science research, philosophical and or theoretical approaches often serve as orientation tools supporting understanding of multiple perspectives when studying complex groups, transformatively shaping the way questions are asked, informing how data is collected and analysed and providing a means to call for change or action (Wilson, 2003; Bagozzi, 2011). In information system research, this encompasses an understanding of the nature of causality, setting out a way to view what exists in the social and technological including the nature of information and the relationships between them (Sims et al., 2005; Wilson, 2003).
Philosophical perspectives are also vital when explaining data, particularly when articulating the reasoning behind the qualitative use of cultural frames of analysis to understand and incorporate attitudes and behaviours (Averweg and Kooeze, 2010). They may also be an endpoint in qualitative studies following an inductive process from data to eliciting broad themes to analysis ending with concepts and themes that constitute generalisations about the research and in some cases lead to theory development. (Hammersley and Atkinson, 2007; Atkinson, 2011).

3.1.2 Paradigm, Epistemology & Ontology

In my research work, I took an interpretivist approach, viewing reality as a social constructed phenomenon, this aligned to my goals in seeking individual and varied perspectives of social reality expressed in actions and meaning making. Rather than assign meanings to variables based research requirements then transition on to model relationships along a linear path from theory to operationalisation to results and interpretation (Babones, 2015), I took a relativist view of reality, considering it to be subjectively constructed and reconstructed through human interactions and socialisation processes. I also took a subjectivist epistemological view to what is known, considering the people are inextricably linked to what they know.

The interest I had in this area of research influenced my axiological views. This was encouraged by the support of gatekeepers and the development of agreeable working relationships over time. It included my own experience of and interest in research in information systems alongside my interest in and affinity for policing. I also drew on previous insight into the complex world of policing and the experience of research in police settings (Kazeem, 2018).

At the onset, the design stemmed from the identification of the phenomenon of interest i.e., the policing organisation and the relationship between the organisation, the people working
in the organisation and ICTs. This was followed by philosophical questioning and exploring research value which included the appropriateness of my intended approach to enquiring and my interest in developing an understanding of the unexplored, holding these against frames of enquiry that could add value to the research community by considering what existing knowledge there was and what was missing.

The process also involved acknowledgement of factors are not often acknowledged explicitly by researchers such as the close relationship between researcher, research methods and research questions (Yanow et al., 2012). By acknowledging my own lived experiences and recognising how my way of knowing and seeing influences my way of seeking and enquiring inclines me toward learning by speech, visualisation, and practice, I was able to approach the research design efficaciously. Beyond this, by making a conscious choice to put preconceptions aside, focus on the goal, and consider my enquiries to be a journey of knowing nothing and being opened to learning everything; I was able to proceed with designing this research.

Then followed an exploration and rationalisation of the principles that guide information systems research: the nature of causality, the way the social world and artefacts are viewed and the properties/attributes of the phenomena (Holden and Lynch, 2004). Additionally, I considered the nature of information and knowledge, relationships between the social and technological and how translation and meaning are constructed (Sims et al., 2005). Consideration was also given to what validates knowledge and what constitutes truth and rationality with attention to paradigmatic differentiation and adequacy of methodology in producing credible knowledge (Horlick-Jones and Rosenhead, 2007; Mkansi and Acheampong, 2012). Theoretical approaches and theories were also explored for relevancy and appropriateness including decisions around suitability and aesthetics (Orlikowski and Baroudi, 2011; Scotland, 2012)
Given that the core research purpose was to enquire about the social, cultural, and institutional context of information and data use, interaction with information systems and the socially constructed meanings police officers subjectively develop around these in the process of risk assessments and decision making at the participant police forces; the resultant design acknowledged the interpretive turn in organisational research, focussing on gaining deeper understanding of what the social realities that were involved with the understanding that the phenomena being explored was intersubjectively constructed between the research participants and researcher (Yanow et al., 2012).

3.1.3 Axiology

Creswell and Miller (2003) highlight the importance of delivering research that is reflective of sustaining integrity by seeing truth. Axiology is closely related to reflexivity as discussed by Gasson (2003). In the case of this research, the subjective meanings derived from the research relied on my own subjective application of understanding and meanings from the participants perspectives (Creswell and Miller, 2000; Gasson, 2003). I considered situated knowledge elicited through interactions over time to be of value and relevant for informing the research goals. Furthermore, taking a practice lens to the interpretive work, understanding of the social process involving people, information, communication, and information systems was prioritised. The practice lens also encouraged self-reflection, acknowledging the research context during data analysis.

It was possible to add more value by seeking avenues to prioritise participant views, enquiring about the meanings behind their actions and views, confirming understandings using member checking throughout the research process. Finally, the thematic analysis and soft systems methodology were guided by holistic application of interpretivism encouraging and enabling interpretations that were plausible and reflective of deep reflection and connection with the data.
3.2 **Information systems research and interpretivism**

Information systems research is often argued to date back to the 1950s gaining traction following the first use of computers in organisations (Hirschheim and Klein, 2012). Described as a collection of data, people, processes, models, technologies, and semi-formalised language cohesively structured to fulfil organisational functions and purposes, information systems provide a means for recording, storing, and managing linguistic expressions. With humans capabilities at their core, information systems depend on and support socially defined control, justifications and sense making and exchange of meanings between humans (Hirschheim et al., 1995). As a result, the study of systems and tools used in the development, operation and deployment of communications and information in organisations, information systems research involves enquiring about the activities that surround and support the management of human activity systems that use information and information systems (Checkland and Holwell, 1999; Kuutti, 1996).

The movement toward interpretive subjective research in this field was the result of a drift away from positivism building on the work of scholars such as Bacon who idealised posteriori approaches in the 16th century motivating inductive approaches to knowledge, to 18th century scholars such as Kant who advocated for enquires to include the influence of history, prejudice and culture on knowledge (Sims et al., 2005). By the late 18th to 19th century, Hegel proposed rationalisation as a means of understanding and Nietzsche and Schopenhauer advocated for interpretation to understand the influence of power on human actions (Husserl, 1970).

Propositions followed from scholars straddling the late 19th and early 20th century such as Horkheimer and Habermas' conceptualisations of critical realism, emancipation and the dependency of ideals on individual interests rather than objective truths (Habermas, 2012), Lyotard's deconstructionist approaches for explaining production and consumption and
Foucault’s postmodern explanations of the effects of power on individual sense and meaning making (Alvesson, 1996; Foucault, 2012).

Other scholars such as Heidegger and Husserl presented phenomenological approaches from the late 19th century onwards (Lopez and Willis, 2004) drawing attention to the interplay between phenomenon and researchers, and arguing for descriptive or interpretive approaches to the process of enquiry (Burrell and Morgan, 1979) and Gadamer reinforced these arguments advocating hermeneutics and the need for understanding through shared meanings in the early 20th century (Walsham, 1993).

As a result, research in this field has developed over time inclining toward exploration of formal and informal practices related to the technical storage and transformation of data and invariances such as cultures, feelings, signals and the creation and sharing of meanings through interpretation of data and interaction with (Hirschheim et al., 1995). IS research therefore involves promoting knowledge and understanding of goal directed behaviours as well as insight into dynamic organisational practices and processes involving power, prejudices, cultures, varied goals, and agendas (Davis, 2000; Alavi and Leidner, 2001; Yamin and Sinkovics, 2010). Additionally, IS research involves seeking understanding of rationales and practices around data capture, storage and processing activities and the technologies and people that are involved the communication of knowledge, information, and data (Davis, 2000; Hirschheim and Klein, 2012).

3.2.1 Inductive interpretivism

Interpretivism is an ideographic paradigmatic approach, focussed on situation specific meanings that are representative of lived realities constructed by the social actors within that setting as they develop their meaning through complex and persistent social interactions that involve activities, history and language (Schwandt, 1994). This builds on previous interpretivist perspectives that view the world as an emergent social process comprised of
ongoing intersubjective social realities created by the people in it (Burrell and Morgan, 1979).

Fashioned around 19th century German hermeneutics, interpretivism aims to derive common sense intersubjective meanings of daily life through Verstehen (a deep understanding) (Goldkuhl, 2017). Verstehen is inclined toward descriptive work centred around unique individual case histories, distinguishing itself from positivist approaches inclined toward Erklärung (explanation) as articulated by Dilthey (Harrington, 2000; Hovorka and Lee, 2010). It promotes discovery and understanding as a purpose of the research, focussing on moving beyond determination of rules and laws to understanding contexts and situations (Willis, 2007). It also encourages and enables a close researcher participant approach associated with in depth access, participation and observation (Walsham, 1995).

It proposes an ‘emic’ viewpoint, by looking at things from the worldview of participants or through the eyes of the members of the culture being studied, devoid of criterion developed outside the culture (Bernstein, 1978). Rather than take an ‘etic’ viewpoint, seeking to be objective and regarding things from outside of the worldviews of participants (Schwandt, 1994) it inclines toward gathering perspectives through analysis, accounts and descriptives in a similar way to the interpretive research in this thesis. It also promotes the identification and expression of conceptual outlines and categorisations that are meaningful to and considered appropriate by the members of the culture under study (Garcia and Quek, 1997).

Interpretivism also builds on hermeneutics’ main strands/variations, inclining toward the philosophical or the critical (considering and unpacking/unfolding historical conditions constituting the substratum of oppression through critical theory) or validation/objective (considering hermeneutics as scientific approach to discovering truth based on post positivism) (Heywood and Stronach, 2005). It borrows from modern hermeneutics
emphasising frames of understanding and the recognition of the importance of language as an enabler or limiter of that which is communicated (Hammersley and Atkinson, 2007).

Although the research reported is not focussed on the practice and theory of interpreting ancient texts and scripts with a view to understanding (the original purpose of hermeneutics), or the socio-political contexts of writings by translating and understanding the meaning of terms, and phrases (Heywood and Stronach, 2005; Ross, 2006), it nevertheless considers the scope of hermeneutics as a means of using historical context to frame understanding of the context of human behaviours, ideas and actions.

Interpretivism was a means of gaining in depth understanding of crime related matters (Treadwell, 2019; Bacon et al., 2020) enabling the reconstruction of subjective experiences through the ethnographic interviews and observation (Geertz, 1973). Additionally, it enabled the capture and articulation of the complex and dynamic work of policing including incidental events that enable an understanding of the people, culture and their perceptions (Westmarland, 2001). It accentuated the representation of individuals with a focus on ways of working and interaction patterns, giving voices to participants. This enabled the highlighting of routines, artefacts, the environment, and representation of individuals and their lived experiences in the context of the research (Eisenhardt et al., 2016). Furthermore, it fostered anti-positivist and nominalist views, providing for an understanding of the research participants on their own terms with the benefit of extrapolating meanings and understanding attached to human behaviour (Boswell and Corbett, 2015).

Figure 2: The inductive process for qualitative research—Adapted from (Creswell, 2016)
As shown in figure 2, this inductive approach supported the exploration of the complex and evolving social and technical interactions in the policing environment, promoting elicitation of thick descriptions and abstraction of themes and constructs. It enabled the comparison of emergent theory and data with literature in order to refine the constructs and identify theoretical connections between constructs (Eisenhardt et al., 2016). It also acknowledged the philosophical underpinnings of research in the field, inclining toward prioritisation of cultural frames of analysis and subjective understanding.

Emphasis was placed on generating value by learning and understanding work practices, exploring identity and sensemaking of the participants. This approach supported understanding of the phenomenon of interest and allowed elicitation of facts through ethnographic immersion, seeking ampliative emergence of theories from data and expanding knowledge by relying on validated premisses. The generation of understanding involved gaining insight, learning, and developing a clearer picture about how and why the people in the organisation do what they do, when they do, as they do. This enabled understanding of the evolving social and technical interactions before drawing conclusions which was important and useful given the complex nature of the policing organisations.

Often used quantitatively for the explanation and prediction of relationships between variables, the positivist approach advanced by Comte in the late 18\textsuperscript{th} century differs from interpretive qualitative research, where the connections between insights are categorised (Cecez-Kecmanovic et al., 2020). Instead of assigning meanings and modelling relationships between variables, the research reported in this thesis focussed on understanding phenomena and knowledge (Lincoln et al., 1985). This inductive approach involved observation of phenomena at different points in time in different settings (Gioia and Corley, 2012). Data was gathered by engaging directly and persistently with participants then subjected to evaluation, seeking interpretation and meanings that promoted the
elicitation of themes which were held against various concepts and theories (Klein and Myers, 1999; Babones, 2015; Walsham, 2017).

Rather than follow a linear path from theory to operationalisation to results and interpretation this research adopted an inductive process, seeking and understanding socially constructed meanings and theoretical constructs (Babones, 2015). Interrelated insights were categorised and grouped into themes providing broad understanding the context of socially enacted practices (Wolcott, 2008) which could serve as foundations for emergent theory (Ratcliff, 2008). This research involved direct and persistent engagement with the participants, forging relationships that facilitated exploration and interpretation of functions and meanings of human actions using explanations and descriptions that gave rise to themed conclusions that enhance understanding (Klein and Myers, 1999; Babones, 2015; Walsham, 2017).

The resultant inductive interpretive paradigmatic approach was aligned to the goals of my research and it allowed me to apply a practice based lens when gathering insight and gaining broad insight into the situation, environment and topic (Killam, 2013). Given the interest in understanding individual meanings and understanding real life interactions and engagements with technological artefacts this approach supported the enquiry into the use of technologies and the emergent structures revealed from individual perspectives (Akoumianakis, 2011).

3.3 The interpretive practice lens and information systems research

Kumar and Dell (2018) highlight the value of computer supported cooperative work (CSCW) research in organisations, arguing that it promotes research into practice and supports the understanding of interactions between people and technologies in collaborative and complex work environments including how these reshape work cultures and practices. They further argue that organisational research in these fields support the improvement of technology design and use (Kumar and Dell, 2018b).
This inclination toward practice in information systems research has been driven by the growing interest in understanding, characterising and accounting for the evolving interactions and actions of multiple individuals as they conduct socially driven actions/work while interacting with technologies (Kuutti and Bannon, 2014). Invariably, a meaningful connection must exist between the research process and procedure and the approaches taken to analysis and presentation of outcomes (Killam, 2013).

Posturing knowledge as that which is socially constructed and reconstructed, this research opposed the foundationalist perspective. Instead, it inclined toward the critical and objective perspective, toward understanding socially constructed cognition. It took the view that if there is no fixed certainty or permanency that can be constructed around knowledge; knowledge will be what we believe we know until we encounter new knowledge that changes our minds. One could liken this to the hermeneutic circle, going back and forth from topic of study, to researcher understanding, to the context of the knowledge in the process of developing understanding or meaning (Prasad, 2002) embracing understanding through an interpretivist epistemology acknowledging the uncertainty of knowledge and the necessity to have a starting point such as previous knowledge (Burman and MacLure, 2005).

This quasi-phenomenological approach is acknowledged as a foundation for practice theory (Kuutti and Bannon, 2014), striving to understand the perspectives of those being studied (Willis, 2007). Phenomenology lends an intellectual depth to research, interesting itself with the local context instead of seeking universals and laws for human behaviour. In this way, it supports the exploration and characterisation of individual meanings with an understanding of individual behaviours. It also advances a basis for the justification of information systems research (Wilson, 2003; Willis, 2007).

From the HCI and CSCW perspective, phenomenological interpretivist approaches support the visualisation of underlying concerns, encouraging a natural approach to problems that
explore the contexts of personal experiences, human agency, engagement and embodiment (Dourish, 2001). Inclining toward Husserl’s cartesian view, anchors meaning in the totality of cultural objects and social activities inculcated in human activity, embracing intersubjectivity when seeking an understanding of how meaning is constructed. Alternatively, it inclines toward Heidegger’s anti-cartesian view, considering human experience in itself as an experience of something that consists of the external world from which we derive our impetuses (Wilson, 2003). Furthermore, it provides a means for evaluating technologies constructed around awareness of the real life world when articulating the effectiveness of context based computing (Dourish, 2001; Wilson, 2003).

The practice approach also involves drawing on hermeneutics, looking at the world as seen through the eyes of the participants, analysing their perspectives, and gaining their first-hand accounts of what is meaningful to them in the process of engaging with technologies while conducting their work (consisting of predicting and assessing risk and making decisions).

The drift toward the practice context dates back to the 80’s predicated on application of Giddens structurisation theory (Lincoln et al., 1985; Denscombe, 2014) in organisational information systems (Morse et al., 2002; Howell, 2012; Hassan et al., 2018). Furthermore, as elaborated by Kuutti and Bannon (2014) there are two coexisting and relevant approaches to HCI and CSCW research; the dominant ‘interaction’ paradigm and the emerging ‘practice’ paradigm.

The former is aligned to ahistorical, HCI scenarios, usually focussed on the human machine dyadic relationship; a snapshot of a specific time, space, and interaction at a point in time through short term research with participants taking part in predetermined experimental activities/short term laboratory type research. The practice approach on the other hand focusses on decentralising the use of interaction to explore changes to human actions as a result of technology use. Instead, it inclines toward methods such as those employed by
Bentley et al. (1992) for CSCW explorations. The phenomenon under study is observed for extended periods of time (as with the inductive interpretivism in this research) to explore human activities in the wider context of changeable factors such as historical performances and processes while seeking understanding of the practices in the setting where use/innovation/adopter of technology takes place.

Rather than explain behaviours as a collective thing, it seeks to characterise individual behaviours by charting their course through time, considering all situational factors including the use of technologies as relevant at each point in time. Longer term persistent actions are studied across their temporal path, dependent on interwoven features of the surroundings and the cultural environment, involving artefacts, people, organisational routines, and daily practices engaged in explicit or implicit cooperation and or coordination with others.

This less adopted approach to information systems research inclines toward the ‘socio-materiality’ advocated by Orlikowski and Scott (2008) conceptualising the dynamic intertwining of work, organisations and technologies situating research in performative and relational contexts gives equal weighting to observed phenomena recognising how they influence and affect one another including what this could mean (Kuutti, 2013; Kuutti and Bannon, 2014).

This practice-based qualitative approach to exploring, learning, and gathering insights from the participant police work groups and subgroups qualitatively then enabled an understanding of police work. Instead of framing understanding of the expressed views and behaviours as the result, context, or background to the interactions between participants and technologies, i.e. interactionist; (Campbell, 1996) understanding was framed around looking at each element/factor i.e. the interaction between participants and technologies as constantly evolving; and the behaviours including expressed perceptions and practices being
equally important and changeable (Feldman and Orlikowski, 2011; Kuutti, 2013; Irvine-Smith, 2017).

It supported understanding the perceptions police officers have of the world and enquiries into how the police do what they do, why they do what they do, when they do what they do, what technologies they use when they do as they do include the influence, impact and outcomes of their cooperative work, their interactions, and their engagement with technology in their work. It draws on the theoretically informed (Howell, 2012) development, source and nature of the knowledge underpinning of the paradigmatic research tradition as a researcher views it when setting out to acquire and create such knowledge.

On the one hand, it was enticing to take the approach of clustering micro-level observations with a view to concluding they are reflective of macro level structural factors such as influence, power, and organisational culture in the context of use of technology. In the case of this research, such an approach could account for the hierarchical structure of the policing organisation and the stratified chains of command and activity. However, this would have led to inadequate explanations for dichotomies or given rise to flawed categorisations given police officers are capable of expressing agency and the scope for varied socially constructed meanings and perspectives in different workstreams. It might also have flawed the articulation of conceptual foundations around and about the way in which technologies are used.

In this respect, the practice approach acknowledged the individual and considers influence, power and organisational culture as aspects that can influence the individual behaviours and perceptions over time, it considers that the individual perceptions of this and each of the reflected practices are not simply because of the interaction with technologies. It enabled a social analysis of the interactions and relationships between people, the organisation, and their technologies, particularly providing an intermediate unit for analysis and discussion of
the relationships between technological artefacts, individuals, and institutions suggested by Orlikowski and Scott (2008). It also supported observation of the world of policing, enabling significant insight into practices, processes, and procedures observed to be a result of historical developments influenced by various forces (Corradi et al., 2010; Kumar and Dell, 2018a).

Furthermore, the practice approach enabled holistic evaluation of the technologies and the interactions and behaviours related to their use (Kumar and Dell, 2018a). It also supported the characterisation, understanding and articulation of an understanding of the sociotechnical world in the participant police forces. This included enabling the rationalisation of and explanation of the cultural, political, and power led aspects with respect to the use of and engagement with technologies.

3.4 Conclusion to this chapter

Ordinarily, research philosophy is concerned with questioning, interpretation and rigorous argumentation including expatiation of the success of conceptualisations or knowledge declarations. In the case of this research, the research approach and research topic including the participants and my inclinations toward the research were precariously suspended between and influenced by the likelihood of access to do the research, the need to conduct research with the least intrusion and disruption to policing work.

While research philosophy adopted for information systems research could be said to appertain to understanding the principles and widely accepted representative rules of conducting research into and about the properties of a phenomena (Mkansi and Acheampong, 2012), it was also important to acknowledge the links between researcher, research and research questions combined with an exploration and understanding of what differentiates paradigmatic views (Gasson, 2003; Scotland, 2012).
By doing this it was possible to delineate a rationale and decide upon what methodologies produce credible knowledge and what constitutes rationality (Horlick-Jones and Rosenhead, 2007). The development of the research approach in this way enabled the evaluation of which theories are appropriate and relevant, how science should be conducted (Orlikowski and Baroudi, 2011), and the axiological contexts of the research including what could validate the knowledge produced (Ahmad et al., 2015), what should be valued and what was a valuable and agreeable approach to the research (Carter and Little, 2007).

As outlined in this chapter, information systems (IS) research inclines toward adaptation of behaviourism, focussing on studying observable behaviour of individuals within social systems to motivate explanations and predictions (Ulrich, 2006). As a result, research in the IS field overlaps sociological enquiry, extending to development of an understanding of the use of technologies, organisations and through emergent approaches that encourage exploration of organisational practices and socio-technical phenomenon (Orlikowski and Scott, 2008; Kuutti and Bannon, 2014).

The practice approach to interpretivism enabled the elicitation of embodied perspectives and insights along their temporal path, acknowledging the continuous situatedness of human actions and the mediation between humans and artefacts (Irvine-Smith, 2017). In turn, this then enabled consideration of important issues such as that of agency and power, change, development, and organisational vs. people dynamics.

The multi-sited inductive interpretive qualitative research approach including the pluralistic analytical process chosen for this research was aligned to the epistemological and ontological views I adopted, and it was a means of learning about, gaining insight into and eliciting understanding of policing with the least intrusion to police work. This was important given that the field immersion was conducted with police officers as they conducted their policing duties.
For the purposes of this research, the practice approach was a holistic means of learning then understanding, enabling the gathering of in-depth insights spanning various issues. This approach provided a basis for conducting this research that aligned with seeking contextual understanding instead of applying analytical laws, enabling the expression of insights through descriptives expressed in terms of categorisations that could potentially be considered appropriate and meaningful by the members of the culture under study (Walsham, 1995; Wilson, 2003; Willis, 2007; Walsham, 2017).

It also provided a means of deriving categorisations while acknowledging dichotomies and relevant internal and external forces. The research reported in this thesis was juxtaposed between the technological and the social, exploring the nature of policing work, the nature of information and how and when and where it exists (Sims et al., 2005), it was therefore relevant to adopt the practice approach outlined in this chapter to support the inductive interpretive enquiry into the nature of knowledge, the principles of how that knowledge is gained and how meaning is constructed by people using information systems (Holden and Lynch, 2004). Overall, this enabled the articulation of concerns and prevented sweeping generalisations when presenting analysed insights.
Chapter 4: Research Methods

“The study of common-sense knowledge and common-sense activities consists of treating as problematic phenomena the actual methods whereby members of a society, doing sociology, lay or professional, make the social structures of everyday activities observable.” (Garfinkel, 1967, p75)

4.1 Introduction

Research methods in information system research are guided by the philosophical strategy, methodology adopted and the nature of the enquiry (Galliers, 1991). Having evaluated the literature and identified knowledge gaps which gave rise to the research questions and identified the exploratory nature of the research and overall research purpose/s. Methods aligned to the chosen theoretical approach and researcher axiology were considered.

Given the primary goal of this research was to develop contextual understanding and gain deep insight, the research focussed on methods that would enable participants to share their thoughts and respond to enquiries in their own words. Although quantitative approaches support explaining or prediction of the relationships between the variables in research as outlined by Creswell (2014), Kasim (2015) highlights its inability to provide an understanding of the subjective social and cultural causes and inclinations that lead to the observed phenomena (Creswell, 2014; Neuman, 2014; Kasim, 2015).

In opposition to this approach, the research goals were oriented toward qualitative, making sense of the cultural environment where the participants display their skills, knowledge, and competence. This qualitative approach also shaped the way questions were asked and how data collection proceeded, supporting validation and revelation of phenomena and knowledge (Randall and Rouncefield, 2010). Additionally, it informed the inductive enquiry and pluralistic data analysis process.
Consequently, this chapter introduces the ethnographic approach and discusses the multi-sited nature of this ethnographic approach taken (in this case ethnographic observations and interviews characterised by persistent and extended field immersion at two police organisations which involved six sites) outlining the relevance and value this approach had when conducting the inductive interpretive work and engaging a practice lens.

This chapter also includes a discussion of the temporary digital ethnographic methods used followed by an explanation of the pluralistic analytical approach taken. Finally, an explanation of the thematic analytical process and Checkland’s soft systems methodology is discussed including an explanation of ethical considerations and an outline of the units of analysis and observation for this research.

4.1.1 Ethnography in policing

Ethnography originates from anthropological research practices concerned with the process of sensemaking of the beliefs, values, rules, and norms that inform human social behaviours and constitute a part of the social world of participants. It is an informant centred methodology, predicated on trust, permissions and inobtrusive immersion in the social world of the participants (Madden, 2010; Hoey, 2014). In the case of this research, it provided a means of making sense of the organisation and cultural environment in which police officers at Bedfordshire and Hertfordshire police forces displayed their actions, competence, knowledge, trust, awareness and skill unobtrusively, iteratively and progressively (Greenhalgh and Swinglehurst, 2011).

exemplify the assertions made by Loftus (2009), that ethnographic research is appropriate when seeking in-depth understanding of the meaning making expressed by police officers, they also reinforce arguments by Manning (2014) regarding the affordance of observations in the wild such as detailed and rich documentation of the values and norms that guide their routine decision making.

Police ethnographies are not without intricacies some of which have been discussed by scholars such as Westmarland (2001) exploring whistleblowing, Rowe (2007c) on the ethical complexities, Loftus (2009) on the methodological issues of trust and access and Bacon et al. (2020) on the variation in positions regarding what could be considered true ethnographic work, funding and time constraints, positivistic criticisms of potential ambiguity when summarising subjective interpretations of meaning, idiosyncratic data sensemaking and neutrality in the context of blurring observer-participant lines. Despite this, police ethnographic research endeavours continue to yield insightful understanding as demonstrated scholars whose work is discussed in Chapter’s 1 and 2 and 14 of this thesis.

Research studies in policing environments are also noted in the existing literature as involving a number of barriers relating to access for independent external researchers in public service settings and the matter of gatekeepers is even more complicated in policing (Hammersley and Atkinson, 2007; Beighton, 2018). Furthermore, the fluidity of the persistent work environment in policing raises concerns regarding intrusion in highly sensitive matters and or obstruction of critical and time sensitive duties (Westmarland, 2001; Bacon et al., 2020).

Ethnography was considered suitable for this research because it considers information derived though observation as readable (Sonenshein et al., 2014), viewing it through analysis of ‘enculturated’ understanding of social actions in the workplace context. It was also considered a means of eliciting modes of meaning making through observation as
outlined by Hammersley and Atkinson (2007). Drawing on the traditions discussed by Orlikowski (1989); Orlikowski and Baroudi (1990); Orlikowski (2000) the ethnographic work conducted focussed, understanding, and interpreting inductively. Applying the interpretive practice lens to the ethnographic data as practiced by Orlikowski (1990) and discussed by Waquant (2002) gave the participants a dominant voice in the findings and enabled deeper interpretation of the research data.

This practice led iterative data collection method supported articulation of interpretive insights. The approach was also convenient, minimising disruption to police officers when observing their activities and eliciting views. Through persistent immersion, it was possible to understand the behaviours expressed in the police workplace in relation to the research focus and derive meaningful, detailed and contextual patterns (Orlikowski and Baroudi, 1990; Waquant, 2002). Additionally, because observation type research involves close and repeated contact, the researcher-observer/observer-researcher co participation role was managed by applying reflexivity throughout the process (Carspecken and Carspecken, 1996; McCall, 2000; Hammersley and Atkinson, 2007).

In contrast to positivist approaches such as quantitative surveys, ethnographic research is often criticised for lacking reproducibility, however, in keeping with the tradition for emergent research outlined by Kuutti and Bannon (2014), the inductive field immersion spanned three years of persistent access to the policing workplace. This enabled observations over time and supported movement toward the development of valid understanding. The maintenance of a field diary, field notes and use of activity diagrams further served as a means of maintaining records of repeated observations of phenomena including descriptions and models of the observed actions during risk assessments and decision making.

The insights elicited provided understanding of work processes and procedures at the participant police forces, embedded adaptations, and adjustments in their constantly
changing environment and the dichotomies of human agency including clarity on the locations of power and influence within the organisation.

In this way, the ethnographic approach supported elicitation of comprehensive insights from worldviews of policing staff and officers enabling understanding of their information use, communication practices and use of information systems for the management of risk assessments and decision making. This thesis therefore asserts that whilst the elicited insights cannot be completely reproduced given subjective researcher interpretations or generalised across all police forces in England given it was carried out in a specific context and space, it is likely that the patterns observed would be similar in other police forces who operate in similar contexts.

4.1.2 Multi-sited Ethnography

This research observed and enquired about the connection and relationships between the people who conduct policing continuously at the two contiguous police forces. Rather than view the two organisations as monolithic entities, they were researched as organisations operating in parallel in a spatially dispersed area. Marcus (1995) treats the topic of multisided ethnography arguing that its core goal is the exploration of social practices that cannot be investigated by centring attention on one single site (Marcus, 1995).

The approach taken in this research was also aligned with Falzon (2009) who asserts that multi-site ethnography creates a time space compression. This characteristic spatial displacement involves expression of repetitive spatial routines leading to elicitation of knowledge which is true to the ethnographic paradigm (Marcus, 1995; Falzon, 2009).

The value of multi-sited ethnographic immersion is further explored by Nadai et al., (2005) who build on the assertions made by Marcus (1995), arguing that investigation of socially derived phenomena is motivated by theoretical questions and knowledge framed around the social world(s) being explored. They contend that the ‘field’ in social research is fuzzy,
lacking clear boundaries supporting enquiries involving multiple participants across multiple locations (Marcus, 1995; Nadai et al., 2005).

In the context of this research, it was noted that the concept of the ‘police force’ is often assumed to be representative of a nationalised police force where every police force is the same. The world system under study in this research, however, was comprised of Bedfordshire and Hertfordshire police forces in the East of England and the local practice(s) explored spread across both police forces offices/sites in different locations within the same locales.

Of note, in the case of this research, ethnographic observations and enquiries including interviews were conducted as police officers carried out their duties at various offices at multiple police sites, in public, in vehicles, and at times in private homes at various hours. The immersion was never in a fixed place as this was not possible or practical given that it was an operational workplace study. Rather, immersion revolved around persistent spatial displacement/movement, involving many participants over time because the operational policing workplace is not fixed, and the work is conducted every day without holidays or breaks.

The trajectory of this research resonates the assertions made by Nadai et al., (2005); in their discourse highlighting Clarke’s (1981) assertions that the social world consists of a set of actors who focus on common interests and act together on the basis of a minimal working consensus and Strauss’ (1984) arguments that the field is a social world consisting of sets of common concerns or joint activities linked by communication networks. They conclude that multi-site research studies enable a juxtaposition of phenomena that are multiply situated, fragmented and often viewed separately and the context for processes, ideas, actions, and their protagonists constitute the social world under study (Strauss, 1984; Marcus, 1995; Nadai et al., 2005).
This approach is not without its limitations. Eisenhardt et al., (2016) draw attention to the difficulties associated with eliciting knowledge that cannot be measured such as views, perspectives, paradoxes, and identity because these concepts indicate how people structure their actions and express their understanding of their situation. They argue in support of the approach taken in this research involving identification and measurement of perceptions by developing rapport through sustained inductive immersion in field and contextual understanding as outlined by Rogers et al., (2016) and Sonenshein et al., (2014). This enabled the elicitation of new insights and knowledge of phenomenon before final data analysis (Sonenshein et al., 2014; Rogers et al., 2016; Eisenhardt et al., 2016).

Furthermore, although factors such as researcher-participant dynamism, maintenance of reflexivity determining data saturation and managing other concerns arising when researching policing (Westmarland, 2001; Rowe, 2007c) challenged the process, the practice approach and spatial variations reinforced the determination to stay true to field immersion and achieve the research goals.

4.1.3 Digital Ethnography

As noted in the introductory chapter, there was some uniqueness to this research which began some weeks before the first outbreak of the pandemic was announced in December of 2019. Notably the first suspected cases of COVID-19 reached the immersion site while immersed in field leading to the subsequent adoption of digital ethnographic methods for a brief period.

Murthy (2008) and Abidin and de Seta (2020) discuss the emergence of ethnographic story telling asserting that digital ethnography enables demarginalization of participant voices, however in the case of this research, the use of digital tools were found to be unsuitable for observations in frontline policing and limited in their use overall. There was also marked concern that departing from the true tradition of inductive interpretive ethnographic work
would alter the paradigmatic standing of the work and or affect or influence asserting its ontological and epistemological meaning.

The digital ethnographic interviews were helpful when engaging with police leaders and specialist staff in strategic and tactical roles for a brief period until access to field was possible. The use of video interviews reduced the informality of the ethnographic discussions and given the nature of policing; conversations were not as free flowing as when discussions were held in person. It was more difficult to read body language and expressions, including voice inflections which are useful for subjective interpretation. This was aligned with the discussions by Pink et al. (2016) who acknowledge the diverse nature of digital ethnographic practice and its potential to alter modes of contact. Despite this, the data collected was useful, contributing to this thesis and adding value to the research process.

4.1.4 Analytical Pluralism

As discussed in previous and subsequent chapters including this one, although research in policing has long been noted to be difficult to access for outsiders due to factors related permission and access (Rowe, 2007c), gaining trust (Beighton, 2018), navigating bureaucracy (Rowe, 2007c) and achieving meaningful cooperation from police officers. As a result, the opportunity to conduct inductive interpretive ethnographic research was maximised to explore and explore the world of policing in a similar way to Bacon et al. (2020) to support the in-depth understanding described by Westmarland (2015) requiring focussed research with a range of enquiries relevant to the central goals of the research.

It was known at the outset that thematic analysis of ethnographic work would promote detailed, insightful, and meaningful answers to the research questions supporting realisation of the research goals while providing insight into the organisations and their day to day concerns, however, ethnographic research is limited with regard to complex problem elicitation and solving. Although there was some scope to adopt an ethnomethodological
research method instead of ethnography given its alignment to practical reasoning and collective accomplishment of actions as outlined by Garfinkel (1967) it was accepted that this approach was misaligned with the interpretive practice lens discussed in chapter 3.

Furthermore, although ethnomethodological insight could be useful, it would be inadequate for evaluating the human centred perspectives in the human activity systems under study. In this regard, engaging ethnomethodology would not have supported realisation of the research goals including identification of problems and solutions that could inform practical actions Rawls (2008).

In order to meet research goals, consideration was therefore given to taking a pluralistic approach to the research process. Barnes et al. (2014) and Clarke et al. (2015) define qualitative analytical pluralism as an appropriate alternative and adaptive approach to evaluating a complex plural world where experiences are multidimensional using two or more methods for analysis of the same dataset. In contrast to Coyle (2010) and Kincheloe (2005) who argue that pluralistic approaches are representative of tampering which could introduce epistemological tensions when choosing interpretive frameworks, Barnes et al. (2014) argue that pluralism counterpoises the limitations of other methods, enhancing transparency, understanding and impact of a project while illuminating the scope of using different analytical methods. Furthermore, as discussed by Frost et al. (2010); Frost and Nolas (2011) analytical pluralism enhanced the differential visualisation of different aspects of the phenomenon observed, increasing the scope to produce knowledge in different forms.

4.1.4.1 The pluralistic turn

The pluralistic approach in this research involved loose coupling by engaging an additional analytical method as described by Mingers (2001). The key requirement was to identify an approach with paradigmic alignment and scope for ‘in tandem’ use alongside inductive ethnographic data collection and analysis. The other requirement was to engage a method
that could enable collective problem structuring, facilitating co-ownership that would engage hierarchical groups within the organisation and enable the production of solutions.

Beyond this, it was important to select an approach that could enable identification and engagement of persons with influence to implement agreed changes following the facilitation of co-created solutions. Given (Owens et al., 2022) assertion regarding engagement of systems thinking approaches enable evaluation of complex phenomenon in distributed networked communities where people are often in different locations. Checkland’s soft systems methodology was considered a feasible and action oriented way to understand the interplay and interdependencies between subgroups and subsystems in the complex service delivery settings observed at the police forces.

Hirschheim and Klein (2012) describes Checkland’s soft systems methodology (SSM) as a means for conceptualising socio-technical processes defining objectives contextually in complex organisations. The SSM approach is a hybrid methodology for problem solving based on Husserl’s perspectives of cultural objects and social activities intertwined with human activity and Webbers depiction of ‘wicked problems’ (Checkland, 2011). It promotes problem solving structured around core systems concepts according to (Checkland, 2012) using an action oriented approach that supports and mitigates change resistance by modelling purposeful human activities within systems Owens et al. (2022).

Although, limited in use, non-specific observational research has been used in to inform SSM by Kotiadis et al. (2014) and Holm et al. (2017). Other scholars have previously used ethnography and SSM such as (Horlick-Jones et al., 2001) who combine both as pluralistic analytical methods to enable solutions that fostered organisation centric health and safety cultures in the UK post office. Horlick-Jones et al. (2001) also engaged the same approach to coordinate safety planning in complex situations involving a diverse group of stakeholders for the Notting hill Carnival. Additionally, SSM has also been used in tandem
with ethnography by Lamé et al. (2019) for characterisation of human resources for discrete event simulation. These pluralistic approaches combining ethnography for observing operational practice in real world contexts and informing deployment of SSM and focus on problems in what Kotiadis et al. (2014) describes as an intertwined approach.

Consequently, SSM and Ethnography in tandem was considered appropriate for this research because both methods align with the interpretive approach. Furthermore, because ethnography enables exploration of contextual factors in complex interventions Leslie et al. (2014) it was considered a suitable means of enabling visualisation and exploration of situational dynamics including key relationships and their implications (Huby et al., 2007).

Ethnography was also considered highly compatible with SSM because the former informs elicitation of collective stakeholder worldviews promoting in depth cultural analysis of purposeful human activity systems while the latter supports cultural analysis for problem structuring and resolution (Baskerville and Wood-Harper, 1998; Lamé et al., 2019). Additionally, Kuutti (1996) and Orlikowski (1992) have previously highlighted the usefulness of action oriented interpretive work, providing scope for pluralistic approaches such as the one engaged in this research. The ethnographic immersion therefore provided ample means to gain consensus on the soft systems conceptualisations of problems and solutions to support desired systemic change (Horlick-Jones and Rosenhead, 2007).

Overall, the pluralistic approach taken served a number of purposes including: increasing the rigor of data collection, enabling concurrent complementarity and validation of data in the iterative analytical process (Coyle, 2010; Barnes et al., 2014; Clarke et al., 2015), supporting the process of concurrent and collective problem structuring Horlick-Jones and Rosenhead (2007); Mingers and Taylor (1992), providing a bridge for communication across hierarchies to enable a consensus on solutions Mingers and Taylor (1992) supporting the translation of research insights for improvement of processes.
As demonstrated in this thesis this approach supported the derivation multiple constructions of meaning making and facilitation of the extraction of as much meaning as possible from data to produce richer and more complex understanding of the topic of investigation (Frost and Nolas, 2011). Engaging in ethnographic immersion and conducting iterative thematic analysis of the ethnographic insights while conducting SSM (an interpretive problem structuring approach following non-prescriptive steps) in tandem therefore created additional knowledge to meet related goals as presented in Chapter 13 of this thesis.

4.1.5 Thematic analysis of ethnography

This research utilised thematic analysis approaches described by Braun and Clarke (2006) as a ‘theoretically flexible’ six stage process of eliciting patterns and themes. Terry et al. (2017) further describe it as an inductive approach to coding and developing themes dependent on researcher subjectivity. Other analysis methods were considered such as thematic content analysis described by Anderson (2007) as a foundational objectivist distillation of data to derive descriptive interpretation representative of the entire dataset or discourse analysis described by Averweg and Kooeze (2010) where data is treated as a continuous and open process of creating knowledge with no final and authoritative interpretation of the data.

Alternatives such as the grounded theory approach as outlined by the likes of Glaser and Strauss (1967) and Bryant and Charmaz (2007), seeking to discover rather than understand phenomenon with persistent reformulation and review of lines of enquiry as a means of constructing theory were considered misaligned with the purpose of this research which sought understanding rather than theory development (Glaser and Strauss, 1967; Bryant and Charmaz, 2007). Additionally phenomenological analysis exploring socially and dialectical collaboratively constituted worldviews as discussed by using reflection, descriptive analysis and lifeworld claims, Lakew and Lindblad-Gidlund (2015) to determine the meanings people ascribe to phenomenon were also discounted as this did not align with the research design.
Braun and Clarke (2019) argue that thematic analysis involves reflexive analysis and development of data domains representative of shared meanings related to central organising concepts. They further argue that the resultant themes are reflective of data collection questions, capturing diversity of meanings related to an area of focus in what Campbell et al. (2021) describe as a reflexive interpretive analytical process. The inductive analytical process then, was data driven, involving familiarisation as outlined by Braun and Clarke (2006), recursively revisiting the research questions and goals, and reflecting on the knowledge situated in the field notes, field diary and activity diagrams created during immersion. In contrast to the codebook approach Roberts et al. (2019) outline, the process of coding was carried out manually. It involved reading and working through the data systematically, reviewing and iteratively engaging with the entire dataset without prioritising or dismissing any aspect then revisiting the questions and goals of the research marking and noting points where knowledge of interest or the basis of repeated patterns was identified. This approach ensured the codes developed organically from subjective understanding of the data (Braun and Clarke, 2006).

This research not being concerned with the practice of positivistic approaches such as modelling and measuring, triangulation as discussed by Babones (2015) were not engaged nor was transformation as discussed by Ratcliff (2008) in his arguments for inductive approaches to grounded theory, rather the analysis involved reflecting on the epistemological indications that could be drawn from the themes by holding them against the entire dataset and the research questions and goals (Ratcliff, 2008; Babones, 2015).

Because data realised in the course of this research spilled into many different topical areas, spanning multiple fields and potential topics of research as described in chapter 1 of this thesis, a creative approach was taken to the paradigmatic and conceptual orientation. This creative approach avoided seeking and finding knowledge, relying on my knowledge and experience of the discipline and use of my research skills as described by (Terry et al., 2017).
It involved paying close attention to the goals of the research, interpreting the data and creating knowledge through thoughtful and meaningful storytelling, exploiting the resource value of researcher subjectivity as argued by Braun and Clarke (2019). It also enabled determination of codes derived from patterns and derivation of shared meaning and domain summaries as described by Terry et al. (2017).

Of note because the ethnographic data had been subjected to member checking as described by the likes of Creswell and Miller (2000), Angen (2000) and Birt et al. (2016). The validation of the insights gathered enhanced contextual understanding of actions, speech, and processes while the thematic analytical process offered freedom from epistemological and ontological assumptions placing emphasis on understanding and knowing. Furthermore, because the field immersion process was iterative, involving continuous analysis and review to ensure alignment to goals; the coding and subsequent analysis was aligned to the research paradigmatic interpretive stance conforming to the prescriptive descriptions of subjective application of knowledge and understanding of the research domain and participants described by Braun and Clarke (2019) Braun and Clark (2019).

The themes elaborated upon in the research insights in chapters 7 to 12 were the result of recursively working on coding and interpreting the data. This involved refocussing by sorting the codes into themes that related to central concepts. The codes and associated data were sorted into potential themes by collating the data extracts related to each one. The outputs of this stage served two purposes, firstly supporting the reporting of insights, and secondly proving useful when the ethnographic data was repurposed for soft systems methodology analysis.

As asserted by Braun and Clarke (2007) it was vital at this stage to recognise that weakness of strength of themes was not indicative of being right or wrong and or to look at this process as one leading to an emergence of themes and patterns (Braun and Clarke, 2006). Instead,
the themes were seen as a reflection of researcher practice, as described by Terry et al., (2017) and Braun and Clarke (2019). This involved applying and linking subjective understanding to the recognition of the socially constructed meanings within the data. It also included active identification of the knowledge acquired through the field immersion process and observing patterns within this by engaging with the data acquired (Terry et al., 2017; Braun and Clarke, 2019).

Engaging with the data in this way coupled with the knowledge of the topic under study and the field(s) of research enabled a systematic review and selection of themes that were relevant to the research goals. The review process that followed involved looking at these themes and thinking about whether they were meaningful, then considering whether the data grouped under each theme expressed a coherent pattern. Some themes were blended because they related to each other, some themes were discarded because the data supporting them was not replicated adequately or limited. Some themes were retained even when the data was not as substantive as others by using domain knowledge to evaluate their importance.

In this respect the theoretical flexibility described by Braun and Clarke (2019) was helpful. For this research, it involved practicing interpretivism, knowing that the research was interested in understanding how the participants experience their world through their intersubjective actions and shared historical perspectives as argued by Angen (2000) (Angen, 2000; Braun and Clarke, 2019). This meant applying the understanding that the data was inextricably linked to the context of the research and invariably influenced by cultural and temporal locations during the process of intimation.

Themes were reviewed by applying my subjective understanding of the context, unique spatial characteristics, and value of the data in order to decide which to retain and which to discard ensuring thorough reflection on the data recursively. Other themes were split, separating them into two or more themes to ensure there was an identifiable and clear
distinction between all of the themes (Braun and Clarke, 2006). The data was revisited again, following the review of themes to evaluate the meanings that were evident in the data and consider whether the themes within the current map were representative and accurate depiction of dataset. During this process, it was possible to code data that had been missed out previously.

In the case of this research, this stage was critical to the inclusion process because the data collection in this research led to capture of various insights within and outside the scope of the research. As a result, while this process allowed the review of the areas that complemented the research goals, as described by Braun and Clarke (2017), it also gave contextual interpretive meaning to the narratives and enabling a deeper, better understanding of the researched organisations. In this way, the this final review involved the careful selection of complementary and relevant themes, taking a subjective and decisive approach to inclusion and revisiting the previous stage to ensure rigor in the decision process as described by Terry et al. (2017).

The data review process then served another purpose, proving helpful when the ethnographic reviewing insights and feedback that was used to inform the soft systems methodology reported in this thesis. As argued by Kvale (1996), the validity of knowledge is supported by interpretations of negotiation of action possibilities and conflicting interpretations by community members. In the case of this research, when the problematic situations were treated, the context and spatial characteristics of the validated themed views and perspectives supported a better understanding of the worldviews expressed in the rich pictures.

Following this, this research included a step which is not explicitly indicated by Braun and Clarke in their guidance and reflection, but acknowledged by their assertions about applying and practicing the epistemological and paradigmatic assumptions the research makes about knowledge (Braun and Clarke, 2006; Braun and Clarke, 2019). In order to maintain
meaningful connections with the data and practice reflexivity and subjectivity, the plausibility of the themes was considered by setting the data and themes aside for a respite period following first final analysis, then revisited again some weeks later to repeat the process. This review involved revisiting the data and goals one final time, considering the nature of the period in which the data was collected and performing a reality check of sorts. This was followed by reviewing the underlying criterion for inclusion and analysis as outlined in earlier paragraphs.

Once this stage of analysis was concluded, the final step outlined by Braun and Clarke (2007) and Terry et al., (2017) began. The outputs of the final stage which included refining and focusing on tying the data analysis to the goals with storytelling. Vignettes, quotes, and narratives are used in three ways, to aid understanding and support expression that brings the participants voices to the fore, analytically, to explain and articulate claims and specific aspects of the insights and illustratively to evidence and illustrate key parts of stories. The insights resulting from his thematic analysis are presented in chapters 7 – 12 and a discussion with consideration for the existing research is presented in chapter 14.
4.1.6 Checkland’s Soft systems methodology (SSM)

Checkland’s soft systems methodology is predicated on systems dynamics (Checkland and Poulter, 2010). According to Checkland (1985) SSM considers individuals as having differing worldviews and interpretations, (all equally valid) and problems are defined by individual worldviews requiring attention to the situation and not the problem. Described by Gasson (1994) as facilitative, SSM involves researchers (taking a practitioner role) to motivate exploration of problematic situations highlighted by actors within the organisation and enable creation of a model of the purposeful human activities related to these situations in the organisational system and or sub-systems in the system (Gasson, 1994).

According to Checkland (2012) systems thinking is an interpretive approach that resists reductionist arguments and recognises emergent properties structured around holistic thinking, embodying four core concepts. That a system is

11. Any entity that contains functional subsystems in which may be a functional/layered part of a wider (hierarchical) system.
12. One where monitorable communication processes exist between the system and its environment to support adaptations,
13. One where control processes exist to prevent shocks from environmental and internal failures during change and
14. One where the characteristics of the system to be changed are definable.

Engaging the people in varied roles (with varied perspectives) in the system, the SSM process enables improvements that they co-create (and reach consensus upon). This is achieved by eliciting shared perspectives, motivating debate, and supporting the articulation of the problematic situation/s and conceptual applicability of the solutions through by therapeutic and interactive facilitation (by the researcher).

The role of the ‘client’ i.e. problematic situation source, ‘problem solver’ i.e. individual/s who desire a change/resolution and problem owner(s) are considered while perspectives of
the customers, actors, transformative process, worldview, owner, and environmental constraints are evaluated alongside the feasibility and sustainability of the transformation by evaluating and ensuring efficacy, efficiency and effectiveness of the solution/recommendations (Checkland, 1985; Checkland and Holwell, 1993).

Figure 3: A flow chart showing the 7 stages of the Checkland's soft systems methodology

SSM is widely acknowledged as an interpretive research approach that promotes organisational learning Walsham (1995) and intervention based on ‘underlying themes’ by van de Water et al. (2017). The SSM process implies a phenomenological model of social reality that recognises different individuals and their differing interpretations of the world by eliciting and supporting visualisation of perceptions, thoughts, and opinions regarding complex problematic situations from the worldviews of the individuals in the organisation (Walsham, 1995)

Engaging with Checkland’s approach to complex problematic situations enabled comparison of contextual ideas to real life situations proving useful for analysing ‘real world’ views and perspectives of the police officers involved in purposeful activities in the complex sociotechnical police organisational system.

As outlined by Ramage and Shipp (2009); Checkland’s Soft Systems methodology provided an opportunity for police officers to learn more about their purposeful activities and interdependencies with other departments. Differing perspectives and views were reconciled
using conceptual and rich images to promote the identification of a common agreement on problematic situations and mediate actionable organised actions. SSM therefore extended the ethnographic work, promoting elicitation of inherent problems and the adaptive methods (if any) currently used to manage them following the principles discussed by Checkland and Holwell (1999).

The seven-step process illustrated in figure 3 involved stimulating discussions that facilitated an agreed consensus (although not absolute) on problematic areas and potential solutions from police officers. In this stead, soft systems methodology performs an effective learning for action purpose, promoting understanding of complex situations suited to the dynamic world of policing. As a result, SSM motivated empowerment of participants, enabling them to take ownership of problematic situations and improvements through action learning (Ramage and Shipp, 2009) and supported coordinated structuring and solving of real world problems Checkland (1985). This approach supported the mediation of improvements and change through interventions (Checkland, 1985).

In the context of this research, while the ethnographic field immersion enabled operational staff capability to express problematic situations, ethnographic data collection alone was not suited to problem solving; it supported and enabled elicitation of themed insights that informed the soft systems analyses in this research. The inductive ethnographic immersion enabled elicitation of meaning making and sensemaking in the context of the prevailing cultures and this provided contextual understanding across multiple points of view (Agar, 2006).

Persistent access to the field enabled learning and understanding including the necessary access to elicit views from the people conducting tasks and activities in various roles and locations within the organisations. The situatedness of the research enabled member checking in situ to confirm and clarify terms, processes, practices, and power positionings
of relevance to the research goals. It also enabled access to individuals in different positions of influence in the organisation.

As data collection yielded insights, they were repurposed using a hybrid approach for visualisation of “real-world” situations. The thematic inductive ethnographic insights were also helpful for characterising and guiding further consultations regarding problems. The activity diagrams that were used to record ethnographic data in tandem with field notes and field diaries in the field were useful for validating insights. They also provided an in depth understanding of the situated social processes and derivation of the initial rich pictures in the first phase of soft systems methodology. This was particularly important as the rich pictures and subsequent steps not only motivated consensus on shared problems, but they also challenged the workforce to contribute meaningfully and co-create solutions by considering their various fixes in a real-world setting.

As a result, the rich images were confirmed by police officers in multiple roles, different contexts, and various settings prior to beginning the analysis providing valuable understanding and characterisation of the activities, the people, and their interactions with artefacts (tools, equipment, and technologies) in varied and multiple activity systems and processes in the police forces. In this way the ethnographic immersion and insights data provided understanding and authoritative clarity (subject to the limitations of the environment and reflexivity) and the interpretive systems thinking approach was particularly helpful for understanding, analysing, and supporting the continued improvement of systems in the organisation in ‘real life’ terms. Overall, the pluralistic approach was beneficial, allowing efficient characterisation of the real world situations and subsequent problem solving (Horlick-Jones and Rosenhead, 2007)
4.2 Ethical considerations, Sampling Data management & Units of analysis

Fieldwork involved immersion at various police sites over a period of almost 3 years despite initial plans to spend no more than 9 months immersed in field. This project was initially reviewed and given a favourable approval by the Open university human research ethic committee on 19th November 2019 with reference number HREC/3348/Kazeem. The risk landscape changed during field immersion requiring further approval to accommodate this research in the context of the COVID 19 pandemic. This approval was favourably approved by the same committee on 15th October 2020.

This research adopted the British Society for Criminology statement of ethics for researchers was adopted and the research was conducted in compliance with the General Data Protection regulation (GDPR 2016), Data Protection Act (DPA 2018) and Official Secrets Act of 1989.

4.2.1 Risks and Control measures

For this research which involved extensive interpretive inquiry due consideration was given to the context of ethical considerations as discussed by Mapedshahama and Dune (2017) with respect to approaches such as ethnography and Tsouvalis and Checkland (1996) with respect to soft systems methodology (Tsouvalis and Checkland, 1996; Mapedzahama and Dune, 2017).

Risks to researcher and police officers were considered followed by privacy and security of data and other incidental concerns that might impact on participants and their organisations. Figure 4 shows a brief outline of the risks and control measures considered in the management of ethical issues during shadowing and interviewing. Figure 5 shows a brief outline of the risks and control measures considered during ethnographic immersion and the soft systems methodology process.
The ethical approach also embedded axiological considerations. Participants were treated as valued and respected contributors to this research. Because observing and interviewing involve open discussions, informed consent was prioritised, explaining the purpose of the research, reassuring participants of their anonymity and right to withdraw. Effort was made to safeguard identities to maintain trust and respect for participants. The research involved...
physical contact, and an investment of time and effort by the participants. As a result, sustaining good and respectful relationships was important, considering the generous effort gatekeepers made to facilitate essential access.

4.2.2 Sampling

As asserted by Rowe (2012), the core difficulties with investigating and researching police lie in the rigors of gatekeeping, which predetermines sampling and access to participants. There are some concerns with gatekeeping and securing access to police sites and working police officers as outlined by Lumsden and Goode (2018) who describe the bureaucratic protocols involved and building trust as discussed by Beighton (2018). Sampling and conducting therefore research were dependent on securing the permission of the chief constables at each of the police forces to engage in research. This in turn required support from police leaders acting in the policing capacity of ‘sponsor’ and security checks, risk evaluations and contingent agreements relevant to disclosure of sensitive information.

The sampling approach for this research was adopted because it was the easiest and least complex means of reaching participants. A non-probabilistic and purposive approach was used as it was considered relevant to recruit participants who were police officers and police staff with knowledge of policing willing to participate in the research on an informed consent led basis. This approach is often criticised in relation to representativeness and subsequent generalisation of outcomes. To ameliorate these concerns, interviews were conducted flexibly to accommodate sudden changes and include senior staff, immersion was sustained by spending entire shifts (7-12 hours at a time) distributed over varied times (over 24 hours to include day and night shift workers), field presence was persistent to enable exposure to as many participants as possible and distributed to include as many streams of work and departments as possible. In the case of this research, my access to the police forces was

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10 Used in policing to denote a senior police officer who supports and facilitates access for a researcher including easing the path for permissions by declaring their support and endorsing the researcher.
facilitated by multiple sponsors who provided support at different stages of the field work. Despite all efforts, one police force later declined to participate. Access to all participants was shaped and influenced by senior police officers with whom I had developed previous professional relationships representative of a quasi-snowball network as an early-stage researcher some years prior. Further characterisation of participant police forces is included in chapter 5.

The participants were a mix of those assigned (due to their availability, role/specialism, and expertise). It also included those who voluntarily agreed to enter into discussions and or enable observations of their activities while on duty in various locations in the community and at police sites. Approximately 323 police officers were observed directly or interviewed in shift durations lasting between 8 to 12 hours at a time. Incidental discussions were possible with about 100 other officers and staff who simply happened to be passing or interested in the research, or inevitably constituted part of the units of observation. At the time of curtailment, 688 hours had been spent in the wild and this thesis is a goal centred account of this time spread across almost 3 years.

4.3 Data collection and management

Data management involved the use of secure cloud and secure storage of handwritten research data. All data material including analysed excerpts and or material and thesis completion was carried out on an encrypted laptop with an erase on loss or surrender capacity. Security updates and firewalls were maintained on the encrypted laptop. A virtual private network was activated on all networked devices used during field immersion and subsequent data storage to protect privacy and prevent data loss and corruption. Phones and tablets containing sensitive contact details and or used to record any research information were secured using encrypted device management services provided by the Open University. Data content was separated according to security needs and encrypted where necessary.
Access to research data was controlled and secure networks were utilised for local digital data stores. Prior to the onset of field immersion, non-disclosure agreements for confidential data were put in place.

4.3.1 Units of observation and analysis

Field work was carried out at the two participating police forces with immersion conducted across 7 police sites. Most of the observations were in frontline policing settings including specialist work streams in different departments. Around 680 hours were spent immersed in field conducting observations of which 61 hours were spent conducting interviews by way of semi structured informal discussions with around 430 sworn police officers and designated police staff in various roles.

The unit of analysis for this research was the subjectively analysed views and records of observations of participants in their work environment as they conducted their duties. This enabled identification of their subjective reasoning, perspectives and feelings expressed though views and meanings ascribed to information, knowledge, and information systems in the process of risk management and decision making in various situations.

The units of observation in this research were the informal discussions with police officers and observation of police officers and police staff in different workstreams in public, police vehicles, police stations, police report rooms and offices, police briefing rooms, police custody suites, police command and control centres, specialist investigation units, inside citizen homes, in public and leisure facilities, during public order activities, during planned police operations and during video and telephone interviews.

Data was gathered from

- Police Information about incidents shared verbally and by phone and radio interactions
- Police information shared in briefings
• Interactions between police officers and various information and communication technologies including technological artefacts relevant and used in the job of policing.
• Interactions between the police and members of the public/members of communities
• Interactions between police officers in the same and different roles
• Interactions between police officers and workers providing other emergency services such as fire and medical emergency services
• Interactions between police officers and police staff by phone, radio, and face to face
• Interactions between police staff and members of the public by telephone, webchat, face to face
• Interactions between police officers and third sector workers located in their offices supporting police work.

Other units of observation for this research included

• IS/IT artefacts— laptops, radios, phones, information systems, databases, body worn cameras.
• Smart devices and mobile applications such as the Good Sam App
• Static artefacts— signage, posters, whiteboards, documents such as memorandums and instructional guides

4.4 Conclusion to the chapter

Research studies in policing environments are noted in the existing literature as involving a number of barriers and considerations including complexities relating to access to independent external researchers in public service settings and the matter of gatekeepers is even more complicated in policing (Hammersley and Atkinson, 2007; Beighton, 2018). Furthermore, the fluidity of the persistent work environment in policing raised concerns regarding intrusion in highly sensitive matters and or obstruction of critical and time sensitive duties (Westmarland, 2001; Bacon et al., 2020).

The ethnographic approach taken was suited to minimal disruption and relevant for eliciting contextual explanations. Although a small adaptation was incorporated into the research plan to enable continuity by conducting online video interviews when the risks of continued face
to face research escalated, the bulk of the research reported here is the result of persistent field immersion in person with various safety measures in place.

The thematic analytical approach was a means of reaching out and inwards using the benefit of subjectivity and reflexivity to situate and create knowledge from within what is arguably a complex and diverse data corpus (Braun and Clarke, 2019). The methods used provided the opportunity to derive value from field immersion and elicit and express broad insights through thick descriptions, themes, vignettes, and narratives. Using the ethnographic insights to inform soft systems methodology instances as practiced by Gasson (1994) and Horlick-Jones et al., (2001) supported the elicitation of real world situations, identification of shared and common problems and identification of transformative solutions (Gasson, 1994; Horlick-Jones et al., 2001).

Collectively the thematic analytical process and soft systems methodology also provided an opportunity to express categorisations about and around the research and engage in learning instances that enabled expression of ideas, problems, concerns, and their solutions.
Chapter 5: Researcher praxis

“I take culture to be those webs, and the analysis of it to be therefore not an experimental science in search of law but an interpretive one in search of meaning.” (Geertz 1973 p.5)

This chapter provides a summary account of the research journey. It includes insights from my perspective as researcher, reflections about access to the field, a summary of the police reception of my research and myself. It contains a reflection including my feelings and lived experience of the research process alongside a self-reflection on my work and the journey from a researcher standpoint. A part of these reflections was previously presented in two conference submissions at the Coping with Messiness in Ethnography Workshop; during the 18th European Conference on see Computer-Supported Cooperative Work (ECSCW-18) in 2020 and the Coping with Messiness in Ethnography workshop during the ACM Chi Conference on Human factors in computing systems in 2021. The insights presented here build on those shared at these conferences, differing from them in part, but also building on the previously shared insights.

5.1 Access and Gatekeeping

The negotiation of access to conduct my research was facilitated through previous contacts I had at the police forces. Following invitation to take up my scholarship, required to confirm I had secured access independently as a condition before beginning my studentship. I was privileged in this sense. I had recently completed my master’s research in Sweden, and I had navigated access and difficulties associated with it previously. It had involved persistence, assertion, and perseverance. In the end after going door to door albeit digitally, I was provided the support needed by a police leader at Bedfordshire police. In the months that elapsed, in him I found a firm but fair mentor whose calm and efficacious countenance and speed for getting things going became familiar quickly. He was able to enable all the checks necessary very quickly and he arranged to meet me each time he conducted any checks to
discuss the next steps. I found and later decided that the only way to conduct research at a police force was to be fair and to recognise that whoever stood in as a sponsor to enable access was taking a risk and placing a measure of trust in my abilities. Beyond that I also developed an understanding of why police forces might be cautious, considering the level of opprobrium that arises when police failures or misdeeds are cast into the open. My research of course was more concerned with learning and understanding the police way of life in a specific context and although I had no intentions of abusing trust, it was also important to have clear understanding of what to do if things go wrong, or if I see something wrong. At the same time, it was also important to give something back by amplifying the voices of participants in my reporting.

By the time I started my doctoral scholarship, I now not only had one contact, but several, and when I approached my mentor to announce my scholarship, I was thrown by the news that retirement was imminent, then elated when he suggested a number of other supporters who I had already met. As a result, access for my doctorate was eased by the goodwill stored up previously. Given the nature of access I required, I proposed a working agreement that would include looking into any areas of operational concern related to my field of work and providing as robust an overview of these as I could. I also agreed to provide working feedback to police leaders on any areas of improvement or excellence I noted on a rolling basis.

One helpful aspect of access was the ability to send emails and phone key contacts. In many cases, I was given the email addresses and secure phone numbers for superintendents, inspectors and or sergeants. This was an important way for me to let them know which day I was coming over. Although I tended to send short SMS messages instead of phone calls, it worked quite well in the busy policing environment.
Given the agile nature of policing work, often the reception staff would get busy dialling a range of extension numbers, sometimes giving me apologetic looks. Having mobile numbers meant I could simply go to a corner, send an SMS, or make a call and someone would be at the desk quickly to pick me up. I almost always had to wait, but lots of things happen in a police station reception area. It was always interesting to sit and wait in the lobby and watch the comings and goings.

There were also some days when I would go to the agreed sites and access would be impossible or impractical, depending on whether there is/was a tactical operation ongoing, or whether the staff were feeling up to having a fly on the wall, or sometimes, whether everyone who should have been informed was informed and or whether whoever was informed remembered they were informed. And so it was that I could drive miles to a location, only to have to turn back and go home.

On those days, I would feel like my progress had been impeded or that I would not achieve my goals for the research, and on other days, I would be secretly elated because persistent field immersion is interesting and enlightening, but it also involves a lot of work and exertion. On some days, I was already tired from repeated days and nights of work and being sent home was not such a bad thing even if it did feel like wasted time.

I reflected on the nature of accessing observations and conversations such as balancing the concern that one is inserted rather than freely choosing because the police force had the ultimate control over which department I would and could go to and to some degree, there was some control over who I spoke to. That said, when observing in operational settings, the dynamism of each shift meant that I was arbitrarily paired with more than one person throughout a 10- or 12-hour shift and I often immersed in timelines that overlapped two operational teams, so it was always possible to meet and discuss with other officers.
The other concern I had was expressing control over participants and the problem of power. The hierarchical police environment put me in a position where those asking officers and staff if I could be paired with them were also in positions where the officers were expected to comply with their requests. In this respect, I identified only two instances where it was apparent from body language and communication that the police officers were not completely happy with having an observer. In surmised that it was linked to their concern about being judged, impeded, or having their performance evaluated. Invariably, if and when this happened, I could ask if I could go out with someone else and when the prospect of taking me along was thrown open, I usually had more takers than I needed.

These reflections enabled me to seek to balance my approach to the research and regard for participants. Overall, my willingness to do as they did, endure the same conditions as they did, served as a means of joining their policing community, learning, and developing an in-depth understanding that gradually bridged the observer-insider-outsider chasm.

5.2 The rigors of fieldwork

Access for this inductive research began after discussions with police leaders in November 2018 following ethical approval delays. This was followed by security and identity checks, signing up to the Official Secrets Act of 1989 and an agreement in principle to embargo the resultant dissertation giving each participant force time to read it and comment on any content. Additionally, discussions were had around any dissertation content they might consider a risk to the facilitation of policing or any information requiring redaction. Arrival at each police station often involved some form of ceremony. Each site had its own specific way of welcoming a visiting researcher and in some cases, depending on the hour, the different protocols would change or evolve.

Often, staff were curious and interested in learning about my research and at times, they would give their views in general. That was often the case and as time wore on, it became
more of the case that folk remembered me, even if they had only met me once and more so, with persistent visits, it became easier, and I became the researcher who arrived and got asked what I wanted to observe or told who was willing to work with me.

Field immersion in frontline policing continued until and including the 16th of March 2020, when the government of the United Kingdom announced a restriction of movement considering the outbreak of COVID-19. Fieldwork stalled until shortly after the relaxation of lockdown conditions enabling the reopening of schools, non-essential shops and ease of social distancing and other social restrictions on the 7th of July 2020 when digital methods provided scope to conduct interviews digitally with police leaders.

This remained the case until the 3rd of September 2020. At this time, some adjustments enabled the resumption of in-person interviewing of police leaders and analysts following completion of risk evaluations. Fieldwork resumed in frontline policing in December 2020 and finally rounded off at the first police force at the end of July 2021, having spent 489 hours immersed in the field at three of their sites. In total, 36 hours were spent conducting interviews with specialists, supervisors and police leaders in child and vulnerable adult abuse, serious and organised crime, tactical policing, community policing, police custody, operational policing, response management, strategic management, and crime analysis. The rest of the field immersion involved observing command and control, frontline police response/intervention to rapid and routine response calls, police custody, and a few specialist departments.

After a brief respite and field note analysis, fieldwork resumed at the second police force in August 2021. Immersion in frontline policing spanned four sites at the second police force over 179 hours spent observing specialist policing operations across safeguarding vulnerable persons, intimate personal violence, police custody, police rapid and routine response, domestic violence, and public order policing. This was interspaced with 25 hours of
interviews with supervisory and senior police officers across some specialist departments, including police custody, police response, vulnerable adults, safeguarding and domestic abuse investigation and safeguarding.

At the time of curtailment in January of 2022, 688 hours had been spent in field immersion, involving interaction with 423 individuals. After a period of data analysis and review, thematic analysis was recessed in February 2022 to enable a period of respite and self-debriefing. I needed to step away before revisiting and reviewing field notes reflexively to finalise my thematic analysis. My review and thematic analysis subsequently resumed in March of 2022 alongside writing up.

5.3 The practice of researching – experiential reflection

Ethnography is intrinsically messy and in the case of this research, it involved charting the journeys of police officers as they respond to disruptive and dynamic events. That journey was unpredictable, exploring the connectedness cultures and role of human nature and power shifts in relation to functional technologies, communication, and practices in policing. The most important aspect of this work beyond learning to listen, observe and ask questions all at the same time, was knowing when to do which as part of my practice development.

I chose to capture everything although that was not always possible. I also opted not to use recording devices because I was mostly in an operational policing environment and spending lots of time with frontline police officers in contact with an array of third parties. My observation of their work always led to incidental contact with persons who were not participating in the research or involved in incidents, at times in confidential circumstances. I also felt the presence of a recording device would alter the participants’ behaviours and responses and therefore it would be inappropriate to record these interactions.

Whenever it was not easy to write, I would sketch activity diagrams and processes as I saw them unfold, then ask questions after. Taking this approach was important, beneficial and in
a way disadvantageous. The activity diagrams were beneficial for validating the data collected and visualising human activity streams, useful and important for the pluralistic analysis engaged and the disadvantage was that it was not possible to figure out what would be relevant or important when observing and I did not often have the luxury of time or space in field to sit and assess each phenomenon and decide which would be relevant or irrelevant. This resulted in a huge sheaf of activity diagrams and field notes at the end as illustrated in figure 6. Having this amount of data was beneficial, affording me the luxury of selectivity when reporting and the opportunity to record insights on broad phenomenon beyond the scope of this research, but also disadvantageous given the rigors of analysing the large amount of data generated.

Figure 6: Image of some field notes during sorting for analysis and inclusion

Sometimes, I would use clear sheets, at other times notebooks, and a few times, I wrote on my hands. Following each instance of field immersion, I found it helpful and therapeutic to write down my reflections, noting my feelings, perceptions, and experiences. At other times, my field diary would become my fieldnote log and vice versa depending on where I was, what I was doing and how easy it was to write anything at all. What was vital was to label, date, and number my notes reviewing them persistently to ensure I was remaining aligned to
my goals. I achieved the latter by noting patterns, and characteristics of phenomenon then returning to my research goals and questions to consider what I needed to know versus what I had discovered.

Beyond grappling with a large volume of fieldnotes, I was also able to reflect on the realisation that I was on five parallel journeys, the first, that of an ethnographer trailing a path of access to the inner echelons of police forces, with the privilege of meeting those who do the work. This was coupled with the task of active listening, observing while seeing it as they see it and learning what they see through their eyes. Additionally, it involved multitasking, switching between observation tasks to enquire and question with the advantage of knowing that they are at ease and open about their challenges and experiences, knowing I am not there to judge.

The second journey was that of the information systems social scientist in a world where social exchanges are occurring, and my interest in the interactions between humans, police officers and artefacts surrounded by the buzzing sense of urgency. This was compounded by the constant activity and the awareness of various exchange processes and reams of data and knowledge passing from person to person.

The third is the socially scientific, law enforcement and criminological inquirer’s journey juxtaposing myself between people, policing, legal matters, and the complicated, complex policing organisation. This with the inexplicable feeling and awareness of being on the “‘other side” of the fence looking in at delinquency, criminality, and criminological issues (some of which change one, some affect one and others that have one locking windows and doors obsessively in between regretfully wishing people came with labels).

This journey was a changing one. The constant awareness that policing spans a broad range of unpredictable events, some changing before my eyes. It changed how I think and see things and frankly changed my perceptions of risk, challenging me in some circumstances.
The fourth was the feeling that one is an accidental unskilled therapist who is seeing the effects of fear, problems, trauma, worry and crime on the emotions of people who are often at the lowest point in their lives when they meet police. At other times it was observing the management of disorder and crime while dealing with people who are swinging between bewildering, angry, erratic, manic presentations, and expressions of vulnerability due to intoxication or unknown factors.

This task of seeing, listening, and being inherently thrust into the various difficulties police officers must grapple with and watching them use multiple artefacts. Observing the work, and the tasks, including encountering first-hand the sometimes emotionally fraught and worrying levels of risk and work conditions as experienced with them as they lived through it. The awareness and understanding emerges as one observes police officers battling with the urge to succumb to indifference or stoicism as they return and repeat and repeat and return to similar but inherently dynamic incidents and watch them strive not to become conflicted changed the way I see the world.

It is a feeling that continues and remains even after departing from the field, coupled with the arresting feeling of being enveloped with reams of information, knowledge, views, and voices, sounds and activities all running riot like a technology-empowered steam train on adrenaline. Part of this could be exposure to the deep end; apart from learning what to do in an emergency or accident and agreeing not to be disruptive, there was little room for cocooning.

Finally, the insider-outsider vs outsider insider battle is not unlike that of others who have trodden the same paths I have. The participants I observed on duty were quite protective and often made the first provision to shield me from harm before anything else. Despite the fierce protectiveness I encountered from all frontline police officers, I was also able to impress upon them that no special accommodations needed to be made for me. Given the extended
field exposure and repeated visits to the field, it was all too often the case that it would take more than one visit for the police officers to stop noticing or accept my presence and relax.

Having realised that I have been on a six-year journey of learning by immersing in police forces, conducting research for my master’s degree at Bedfordshire which began in the fall of 2015 and ended in Spring of 2018, then beginning my doctorate research in the fall of 2018 and remaining involved in field work with the police forces until 2022. It is relevant to acknowledge the experiences and feelings that came with it.

Even with my hopes of turning out a worthy contribution to knowledge, there was always something. In my case, all too often, I am reminded that at the end of this spectrum somewhere, there always is someone who blatantly looks me in the eye and says, “You are one of them,” not that I know who ‘them’ is; and when I ask, they usually do not know either.

5.3.1 Pavements and the night life dance – Research practice vignette

One of such experiences occurred in field during public order response. One of a group of revellers had been temporarily arrested to be de-arrested at a station following dramatic events. One of the members of the party then accused the two officers I was with of seizing their belongings in the earlier melee despite my having seen the same individual collect the items and go out of sight. On seeing me standing by passively, they decided to turn their attention to me.

“You, yes you, you’re a sell-out, you’re with them, you agree with what they do to us, is it fair to put the citizen in the van.”

To which I replied:
“I’m sorry I am just an observer, please do as the officers say and meet your friend at the station,” which seemed to infuriate the citizen more.

“You’re one of them, no way you’re an observer, you are just like them, you think we have no rights to go out, you’re here to make sure they carry out orders and now you told them to take our bags.”

At which point I was forced to tell the citizen I had clearly observed them collecting the belongings from everyone else because my role there was to observe, and I observed. At the end of the encounter, I was reminded me of the various views and perceptions I had been confronted with as a consequence of spending extended periods of time immersed in police forces for field work.

One of the things I had become aware of for the last seven years I have spent conducting immersive research at police forces was that I was often the only person of colour in the room or building however this never hindered me and if it did, I did not notice.

I was also reminded of the reactions and side comments from acquaintances when I started my research. Admittedly, given the nature of my work, I have not been given to regaling others with my experiences nor am I usually inclined that way. But overall, carrying out this research reinforced the stereotypical perspectives and opinions communities have concerning women and people of colour (and by extension police officers) Most of my negative experiences were from people who saw me going in and out of police sites at strange hours or out in the back of police cars often.

I considered during this research if my presence as a person of a certain race, gender and religious background influenced participants or if my experiences reflected attitudes or views of the same but found that most people, I encountered were more inclined to drift into the kitchen if I got a chance to eat to entice a recipe out of me or ask what smelled so good.
People of colour often complain of the hair experience which is a marker of sorts and for me only once did someone comment on my hair being interesting. Perhaps as I am often told, I was far gone enough in immersion by then because “leave the fro alone, I have enough problems with broken combs” worked just once.

The participants in this research expressed genuine interest in what I knew and what I could give insight into through my research. Repeated immersion had the benefit of providing for a better understanding of their world and enabled frank discussions with them. Given that I spent 700 hours equivalent to almost two years of full-time work and encountered almost 400 police officers and staff, there was little indication of inculcated racial bias at both police forces and little room for that many people in so many different places to consistently pretend.

My discussions about diversity were often marked with police leaders asking me what I thought might attract women and people of colour to the police forces. And my response remains the same driven by observation and knowledge. Firstly, work of policing has marked differences from what the public imagine it is about, it is hard work, with long hours for little pay and nominal remuneration at end of service. Response policing is also far removed from ideations based on watching policing documentaries and dramas that sensationalise policing and promulgate the focus on catching criminals. This has implications for attracting the younger generation who might struggle with this given the emergent opportunities to earn more and work less in more innovative industries.

Societal gendering continues to discourage women and societal conditioning continues to discourage people from ethnic minorities from considering policing as a career. Although I cannot directly challenge discoveries of bias and gendering in the police profession or deny it given evidence from other scholars who researched elsewhere, I am inclined to the view that the biggest problems are outside policing because those who promulgate discrimination
inside any organisation start their learning and socialisation of views outside policing and they go home to maintain their perceptions every day after their shift. Furthermore, when all is considered individuals who are attracted to policing as a career will face the same challenges even, I faced as a researcher. The level of scrutiny, accountability and public expectations are high, so much so that choosing the profession becomes more of a choice between being ‘normal’ or being “one of them”.

My own experiences of policing and insights from others that I know were precursors to my seeking to know, but I was thankfully guided by my first mentoring professor who had many years of ethnographic experience. On this when I set to it, I asked, “when I get there, what do I do” and he said, “just listen and observe and for goodness sake if they start to run away from something, run” and then once I began it was guided by my determination. I went into the police organisations with goals, those goals were aligned with taking what access I could get, learning what I could and informing the academic community about and around the work of policing focussing on the use of information, communication, and technologies in the process of risk predictions and decision making. I was primarily focussed on getting that as right and correct as possible above all else.

Given all this my final experience of others’ during my research was the condescending, and sometimes vocal treatment from strangers and at-times acquaintances; stereotypical no less, with those who assumed and sometimes expressed their views that I must be a lady of the night, or a persistent and unrepentant criminal given my frequent visits to police stations and sites along with regular rides in the back of police cars. Beyond that at the far end of the spectrum, there is the less facetious situation where someone honestly does not understand why at all one has chosen to explore policing, and then again what it all means who asks … “So… What’s your essay going to be about?”
Chapter 6: Research setting

6.1 Introduction

This chapter begins with a brief historical overview of each of the police forces researched for this thesis extending to include information from official documents and some research insights. This research sought an understanding of the unique relationship between Bedfordshire police force, Cambridgeshire Constabulary and Hertfordshire Constabulary (often referred to as the ‘Triforce’/BCH alliance) and its influence on their communications, technologies, and information systems. An outline of their leadership, policing strategy, workforce numbers, and organisational work distribution is presented to enable visualisation of the participants’ settings. It concludes with an explanation of the collaborative relationships between the three police forces; the Bedfordshire, Cambridgeshire, and Hertfordshire alliance (BCH/Triforce alliance) mentioned in this thesis and a brief research motivation summary.

6.2 Bedfordshire police force

Policing in Bedfordshire dates to 1836 with the establishment of Bedford borough police under the police clauses of the Municipal Corporation Act of 1835. Before this, the county had relied upon parish constables and unpaid officials appointed by the manor court to keep the peace (Emsley, 1982). Subsequently, Bedfordshire Constabulary was established in 1840 under the County Police Act of 1839, followed by the formation of Dunstable borough police soon after it became an incorporated borough in 1865. Luton borough police was later established in 1876 when Luton became an incorporated borough.

Bedfordshire Constabulary absorbed Dunstable borough police in 1888 following the abolition of independent police forces in small towns under the Local Government Act of 1888. Luton Borough police and Bedford Borough police were absorbed by Bedfordshire Constabulary in 1947 under the Police Act of 1946. Finally, in 1974, Bedfordshire
Constabulary was renamed Bedfordshire police force (Bedfordshire Archives Service, 2016).

Early records show that each of the earlier police constabularies and borough police forces were involved in attending to petty crimes ranging from thefts to domestic incidents, public disorder, affray, welfare, shootings, deaths, missing persons, livestock theft and such like. The most notable incidents in the area occurred in 1831 during the agricultural unrest and later in 1835 following revolts against the poor law. Specially enrolled constables and the metropolitan police force were summoned to intervene and quell the riots at the time, potentially motivating the establishment of the first formal police force in the region in 1836 (Bedfordshire Archives Service, 2016).

Bedfordshire police force is headquartered in Kempston near Bedford. It has been led by a single chief constable since 2019, alongside one assistant chief constable, one deputy chief constable and an assistant chief officer. They are all collectively accountable to the politically appointed police and crime commissioner for Bedfordshire County, who replaced the Bedfordshire police authority in 2012 following the enactment of the Police Reform and Social Responsibility Act 2011.

The police force currently employs 1379 sworn police officers and 1106 staff and designated officers\(^{11}\), supported by 127 special constables and 48 police community support officers (PCSO) (Home Office, 2022). They police an area of 477 square miles with a diverse population of around 682,000 citizens distributed across three district and borough local councils.

The Bedfordshire police strategy is based on an intelligence-led lean business model. Assessments for effective response to emerging threats at the police force engage the UK

\(^{11}\) A member of police staff designated with specific powers and duties ordinarily held by a police constable under S38 of the Policing and Crime Act 2017 by the chief officer of police of any police force.
government’s MoRiLE\(^{12}\) (Management of Risk in Law Enforcement) scoring. This enables a structured decision-making approach around policing goals and crime problems. It also promotes continuous management and assessment of risks using crime data and technologies as strategic planning tools (Ratcliffe, 2016c; OSCE, 2017). Its lean approach encourages resource management through continuous improvement of work processes with an emphasis on managing limited resources, eliminating inefficiencies, and enhancing skills and tactics (Barton, 2013b; Rodgers et al., 2019). In addition, it has implemented a quality management program (QIP) to reduce demand for and improve the efficiency of work processes. The QIP supports the derivation of savings by improving their performance against control strategy priorities, eliminating redundant processes and actively seeking areas for collaboration with other police forces and external agencies (OCC Bedfordshire, 2016).

These strategic approaches enable the reinforcement of community relationships and partnerships and support the engagement and use of technologies to exploit local police intelligence and continuously improve their data quality and operation. Their most recent public strategy outline also includes awareness of the need to promote inclusivity and diversity within their workforce.

Operational policing in Bedfordshire is split into three districts covering the Bedford, Luton, and Central Bedfordshire local authority areas. The police force currently has four active police stations, two located in Kempston near the centre of Bedford, one in Dunstable and one in Luton. Of the four, Luton police station and one of the stations at Kempston are customer-facing between 9 am and 5 pm daily with limited hours at weekends.

\(^{12}\) A 2-strand strategic risk management approach for law enforcement business intelligence risk prioritisation modelling that embeds cyclic risk monitoring and scoring processes. MoRiLE engages a tactical tool for day to day tactical and operational processes and a thematic tool to support understanding of strategic risk and assessment processes. Both tools are used by police forces to ensure understanding of the impact of defined risks and financial, physical, and psychological harms including capacity and capability to respond to these risks and harms in the contexts of meeting public expectations, sustaining service delivery, organisational improvement and engagement with decision making partners.
The force control room charged with handling, processing, and tasking emergency and non-emergency calls is collocated within the police force headquarters and police station at Kempston. The control room is supervised by a control room inspector (addressed as Oscar I\(^\text{\textsuperscript{13}}\)). Oscar I is supported by a control room supervisor (Oscar II) alongside call handlers who are trained police staff.

Two custody suites open 24 hours a day are located at Luton and Kempston. Both are equipped with audio-visual booking in counters, and they provide biometric identification services, access to scientific tools for assessing levels of intoxication with alcohol including managed monitored temporary remand cells and interviewing rooms. Custody inspectors supervise the custody suites, and custody sergeants\(^\text{14}\) carry out day-to-day custody bookings alongside custody officers (designated officers\(^\text{11}\)).

As the current regional lead police force for England’s eastern region special operations unit [ERSOU] and the eastern region counter-terrorism investigation unit [ERCTIU], the leadership team at Bedfordshire police force is supported by three detective chief superintendents, two detective superintendents and four superintendents who lead crime and public protection, local policing, serious and organised crime including various intelligence units and complex crime units.

Each of the three local council areas is supervised by a chief inspector responsible for community policing and safety partnerships. A duty inspector supports the response teams\(^\text{15}\) who typically takes on the role of custody suite PACE Inspector\(^\text{16}\) during twilight shifts. The

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\(^{13}\) a term used to clarify who leads in rank and authority in the control room who often doubles as a Bronze officer in an often-temporary command structure designation that specifies the hierarchy of command for calls that require a major operations command structure. Also applicable during spontaneous or planned strategic, tactical and or operational incidents

\(^{14}\) A level 2 police officer in a supervisory role ranking above the rank of police constable.

\(^{15}\) An inspector is a sworn police officer in a level 3 manager/expert, one rank above a Sergeant (who is a level 2 team/technical lead supervisor) and one below chief inspector who is also in a level 3 manager/expert role (outranking an inspector by virtue of knowledge and experience and or length of services)

\(^{16}\) so named to denote an officer responsible for compliance with the Police and Criminal Evidence Act of 1984 in the police force custody suite
inspector is supported by two to three sergeants per rotation shift who support and supervise police constables working on shifts in rotation round the clock.

Police constables/response officers are responsible for attending non-emergency and emergency police callouts to provide intervention and response services, including general patrol duties. In addition, police officers are located at two hubs within the county alongside police community safety officers tasked with providing safer neighbourhood services, including local interventions, maintenance of local knowledge and awareness of local policing issues within electoral wards in the county.

The police force also has specialist units to manage children and vulnerable adult abuse, safeguarding, domestic violence, serious and organised crime, tactical operations, serious and complex crimes, public protection, and centralised intelligence services.

The research reported in this thesis includes data collected through field immersion involving observations and interviews with police officers in varied roles and ranks, designated officers at Luton and Kempston police stations, staff at the force control room and police analysts. This included officers of varying ranks in the specialist areas of community crime, force command and control, child and vulnerable adult abuse, public protection, serious and organised crime, and domestic violence including.

6.3 Cambridgeshire Constabulary

Dating back to 1835, policing in today’s Cambridgeshire was distributed between multiple police forces. With varying municipal boundaries at the time, Cambridgeshire borough police was created in 1836, covering the historic city of Cambridge under the police clauses of the Municipal Corporation Act of 1835. Wisbech borough police was also created in 1836, enacted and followed by the Isle of Ely Constabulary (covering the districts of Chatteris, Ely and March) in 1841 under the County Police Act of 1839.
In 1851 Cambridgeshire police was created to cover other geographic areas near Cambridge city. By 1856, the enactment of the County and Borough Police Act 1856 led to the creation of the Huntingdon police force and Liberty of Peterborough police force in 1857. Finally, Peterborough city police was created in 1874, covering a different geographic area from the Liberty of Peterborough police force. Wisbech Borough Police force was subsequently absorbed and merged with Isle of Ely Constabulary in 1889 due to changes in municipal jurisdiction and boundaries.

The police forces all continued independent operations in the region known as Cambridgeshire today until 1947 when Liberty of Peterborough police force and Peterborough city police merged to become the soke of Peterborough combined police force. Subsequently, in 1951 Cambridge borough police changed its name to Cambridge city police force. Finally, following the enactment of the Police Act 1964, Cambridgeshire city police force, Isle of Ely Constabulary, Cambridgeshire police force, Huntingdon police force, and The Soke of Peterborough combined police force amalgamated to create Mid Anglia police force headquartered in Brampton, Huntingdon in 1965. Mid Anglia police force later became known as Cambridgeshire Constabulary in 1974 following municipal and county boundary alterations under the Local Government Act 1972 (Badgers Lair, 2013).

The Constabulary is headquartered in Hinchingbrooke, Huntingdon, and it has been led by a single chief constable since 2018, alongside one deputy chief constable, one assistant chief constable, a chief finance officer, one detective chief superintendent, and one chief superintendent. The director for ICT and Director for human resources for Bedfordshire police force, Cambridgeshire Constabulary and Hertfordshire Constabulary are located at Cambridgeshire police force. In similar stead to the leadership teams at other police forces/constabularies, they are accountable to the politically elected police and crime commissioner for Cambridgeshire County under the Police Reform and Social Responsibility Act 2011.
Cambridgeshire Constabulary currently employs 1683 sworn police officers and 895 staff and designated officers, supported by 139 special constables and 35 police community support officers (PCSO) (Home Office, 2022), policing an area of 1311 square miles and a population of 856,000 residents across five district areas. These include Cambridge City Council, South Cambridgeshire, East Cambridgeshire, Huntingdonshire, and Fenland.

According to official documents, Cambridgeshire police strategy is centred around staff retention and wellbeing, recognising the need to improve diversity, equality, inclusion, and ethics. They also include improving partnerships with police alliances, the criminal justice partners, and the College of policing. The Constabulary is focused on improving investigatory standards and data quality, meeting national policing requirements, identifying opportunities for overall improvements, and recovering from the impact of the pandemic to deliver value for money and develop better ICT and digital policing approaches (OPCC Cambridgeshire, 2021).

The Constabulary currently has 12 police stations in Huntingdon, Cambourne, Parkside, Cambridge, Ely, Histon, March, Thorpe Wood, Peterborough, Sawston, St Ives, St Neots and Wisbech. Of these, only two, Parkside and Thorpe wood, are customer-facing between 8 am and 8 pm, with the remainder operating an appointment system for public enquiries (Curtis, 2021).

Field immersion, interviews and observations conducted for this research did not extend to the Cambridgeshire Constabulary, given that they declined to participate. The information included in this thesis regarding this police force was sourced from official documents and literature.

6.4 Hertfordshire Constabulary

Policing in the Hertfordshire area dates back to 1836 with the formation of Hertford borough police and St Alban Borough police under the police clauses of the Municipal Corporation
Act of 1835. Hertfordshire Constabulary was later founded in 1841 under the County Police Act Of 1839. The Constabulary covered Hertfordshire except for Bushey, Cheshunt, Radlett, Potters Bar, and Borehamwood districts which fell under Metropolitan police jurisdiction.

Hertfordshire Constabulary subsequently merged with Hertford borough police in 1889 and St Albans borough police in 1947 (Herts Past Policing, 2013). It eventually acquired Bushey, Cheshunt, Radlett, Potters Bar, and Borehamwood districts in 2000.

Early records dating back to 1900 from Bishops Stortford in East Hertfordshire indicate that police officers on duty would record their daily incidents and duties in a duty register in a somewhat meticulous fashion (Herts Past Policing, 2013). The records indicate that most police work involved dealing with day-to-day peacekeeping and binding over, vehicle defects, public order, licensing, and reporting. Their work included dealing with thefts, assaults, lost and found, animal licensing, livestock welfare and thefts, welfare (including shootings, deaths, domestic incidents and child abuse), missing persons, assaults, drunkenness and road offences, including alien reporting during WW2 (including eastern European and German visitors, migrants and those fleeing Nazi persecutions) (Herts Past Policing, 2012)

The Constabulary is headquartered in Welwyn Garden city near Hatfield, and it has been led by a single chief constable since 2016, supported by two assistant chief constables and a deputy chief constable. They are accountable to the politically elected police and crime commissioner for Hertfordshire County under the Police Reform and Social Responsibility Act 2011.

The police constabulary currently employs 2288 sworn police officers and 1566 staff and designated officers, supported by 187 special constables and 207 police community support officers (PCSO) (Home Office, 2022), policing an area of 634 miles and a population of 1,200,000 residents across ten local council areas.
Having recently adopted a prevention first operational strategy to policing the county, Hertfordshire Constabulary is focused on maintaining their intelligence-led policing business model at a standard that enables the sharing of information and promotes maximised benefit from their information and communications resources. Their current strategy is aligned with the MoRiLE\(^{17}\) approach to strategic risk management including localised action to improve the quality of their services, maximise resources, reduce custodial sentences and remand alongside promoting a community-centred approach to managing harms and crimes.

Policing of the county is split into ten local policing areas representative of the local council areas across Watford, Welwyn and Hatfield, St Albans, Stevenage, Dacorum, Three Rivers, Hertsmere, Broxbourne, East Herts, and North Herts local council areas. The police force has 13 police stations across the county in St Albans, Hatfield, Harpenden, Hemel Hempstead, Welwyn Garden City, Hitchin, Letchworth, Stevenage, Watford, Abbots Langley, Oxhey, Rickmansworth and Borehamwood. Four of these, Hatfield, Stevenage, Watford, and Rickmansworth, are customer-facing, operating a range of hours between 8 am and 8 pm at the latest.

Calls for police assistance are received, logged, and distributed to workstreams around the clock via the force control room co-located with the Constabulary headquarters at Welwyn Garden City. The force control room is supervised by a force control room inspector (a sworn police officer addressed as Oscar 1\(^{11}\)) and a control room supervisor (Oscar 2) alongside call handlers who are ordinarily trained police staff.

The Constabulary also has two custody suites equipped with audio-visual booking in services and monitored temporary remand cells complete with interviewing rooms located at Hatfield and Stevenage, each supported by Custody Inspectors responsible for supervision.

\(^{17}\) See Footnote 10 in Section 6.2
and PACE inspections and Custody Sergeants (ordinarily sworn police officers) who manage teams of custody officers (usually civilian staff).

Two superintendents oversee the ten policing districts in the Constabulary, while each of the districts is led by a chief inspector and an Inspector. They manage district work teams across response and intervention, custody, and safer neighbourhoods/community policing units. Each district is served by at least five response and intervention teams working in rotation round the clock, and each team of response and intervention officers is led by a supervising sergeant reporting to a district inspector covering two to three districts per shift rotation.

The police officers are responsible for emergency and non-emergency police service response and intervention, including general patrol duties. In addition, there are 75 safer neighbourhood teams comprised of police officers and police community support officers distributed across electoral wards within each district to maintain awareness and knowledge of quality of life and local policing issues. Hertfordshire police force also staffs specialist units including vulnerable adults, child abuse, safeguarding, domestic violence, serious and organised crimes, public order and protection, complex crimes, and force intelligence.

The research reported in this thesis involved observations and interviews with police officers in varied roles and ranks, including police staff at Welwyn Garden City, Hatfield, Stevenage, Watford, and Rickmansworth police stations. Staff at Hatfield and Stevenage custody suites and police officers in the specialist areas of vulnerable adults, safeguarding of children, domestic violence, public order and protection and complex crimes also participated in the research.

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A team of 3-10 police officers and police community support officers dedicated to policing specific areas of the community, working with police partner agencies and local communities to identify and tackle issues of concern, quality-of-life issues, and disorder.
6.5 The Bedfordshire, Cambridgeshire, Hertfordshire Triforce alliance

The inception of the close working relationship among the three police forces/constabularies dates back to 2007 (BPA, 2009). At the onset, Bedfordshire police force and Hertfordshire Constabulary entered into an agreement to share resources and collocate their major crime unit/s pursuant to meeting national strategic policing requirements and encouraging savings while increasing technical standards and capacity and procurements. Initially staffed by around 145 police staff and officers from both organisations, the joint arrangement enabled sharing of information and resources. It also motivated efficacious management of crime across their borders, extending the scope of intelligence about and around serious crime and their capacity to seek and apprehend criminals (HMICFRS, 2008).

A year later, following consultations regarding further collaborations (HMICFRS, 2008), both police forces established a joint civil contingency and operational planning unit and extended their collaboration to include shared/joint scientific services, dogs services, counter-terrorism/domestic extremism, firearms and professional standards enabling estimated joint savings of £2,000,000 (BPA, 2009). By mid-2010, this had further extended to include joint pension administration and a joint information and communications technology department (BPA and HPA, 2010).

In late 2010, the joint alliance extended to include the Cambridgeshire Constabulary. The three police forces initially explored options to merge or forge close working relations and or shared resource agreements due to severe cuts to police funding (HPA, 2010). Instead of a merger, the three organisations entered an extended collaboration across crucial service delivery areas incorporating a savings program dubbed the Triforce alliance.

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19 Crime concerns that the government has a duty to monitor and support police forces with, so they have sufficient capabilities to respond to serious crimes and cross boundary threats under s37A Police Act (1996) as amended by s77 Police Reform and Social Responsibility Act 2011.
The alliance between the three organisations (often referred to as the Triforce/BCH alliance) involves sharing resources and joint planning in interrelated critical service areas, including firearms and explosives licensing, road policing, major crimes, scientific services and police support units and ICT resources with the latter focusing on use and sharing of data and information and communications technology sourcing. Others include armed policing collocated at Luton airport and Cambridgeshire Constabulary headquarters (HMICFRS, 2008).

Of note in the context of this research, the ICT strategic alliance between the three police forces/constabularies focussed on enabling quick service delivery for public and staff engagement, augmented business solutions and core infrastructure necessary for continuity of service delivery at a standard adequate for policing. To achieve this, the plan set out by the BCH alliance includes an assertion that they structure their strategy around a lean agile model of service that promotes efficient sharing of information and police intelligence. According to their ICT strategy document, the model is designed to actively prevent duplications, errors and omissions, enable good data quality and promote service access and delivery via single points, among other benefits (Bell and Black, 2017).

Since the inception of the BCH agreement, other relevant collaborative efforts in the East of England have taken place. In 2015 seven police forces, including Bedfordshire, Hertfordshire and Cambridgeshire, joined alliances to create the second largest collaborative procurement collective in England (HMICFRS, 2020b). The joint procurement team (called The Seven Force Strategic Alliance/7F) represents the seven police forces/constabularies in the East of England, including Bedfordshire, Cambridgeshire, Essex, Hertfordshire, Kent, Norfolk and Suffolk (HMICFRS, 2020b).

According to official documents, the goal of the collaboration between the police forces is to improve their commercial approach to the standardisation of police services. They set out
a rationale for achieving operational efficiency and interoperability to meet national directives and discharging police functions through advantageous joint working, collaboration and enhancement of capabilities improving efficiency and efficacy (OPCC, 2016).

The collaborative effort which previously existed between Bedfordshire, Cambridgeshire Constabulary and Hertfordshire Constabulary has now enabled the institution of one single procurement department for all constabularies and police forces in the Eastern region (HMICFRS, 2020b). Procurements requisitions and contracts are now group sourced to meet various operational and support needs, including police transformation fund bids, serious and organised crime capabilities, digital asset management and enterprise resourcing.

One of the aims of the 7-force alliance is to implement an ICT infrastructure that supports collaborative working all seven police forces including the eastern region special operations unit (ERSOU). Their long term collaboration goal is to consolidate force control room command and control software (STORM) , Athena case management and crime investigation software service, the proposed emergency services network (to replace airwave networks) and criminal justice and mobile policing services (Donald et al., 2017). In line with this, the seven police forces/constabularies have now forged a shared strategy and vision around the infrastructure and planning of their ICT resources. The organisations have all adopted the same information and crime management software suite which provides local record management, crime management, case preparation and custody management capabilities. (Kent PCC, 2021).

Led by a team of ICT directors distributed across the seven organisations, they also collaborate and share their IT infrastructure and planning, mobile policing provisions and management of their criminal justice links (Donald et al., 2017). They share funding for personnel services and jointly procure for their ICT needs across their emergency services
network needs, airwave services, crime management services, enterprise resource management provisions, crime investigation and case management software.

Additionally, they currently operate joint resourcing to meet collective needs with respect to criminal justice, armed policing, joint software benefit realisation (by using the same crime management software), ICT needs, specialist operations training, vetting and business support services (7F Programme, 2020). Additionally, West Mercia and Warwickshire police forces adopted the same software suite in 2015 without joining the collaboration collective, creating a more extensive information/record-sharing network between the nine police forces (Kent PCC, 2021)

6.6 Conclusion to the chapter

Gathering insights from each force supported understanding and clarity about and around working practices, cultures, and perspectives, and working conditions in policing organisations in the East of England. By conducting the research at these police forces, despite one Constabulary declining to participate, it was possible to see how data, knowledge, and intelligence sharing, including shared resources, influence cooperative working. It was also possible to observe human-computer interactions (HCI) and gain perspectives around and about practices related to the use of technologies, including data use and management.

It was enlightening to learn about the impact and perceptions around sharing of resources. It was also beneficial to learn and observe the impact of variations (including the reasons behind them) in resource levels, approaches to technologies, processes, and procedures on policing, including the impact of the global pandemic. Finally, by engaging multiple police forces across multiple sites, each with different layouts, staffing and dynamics, the reporting in this thesis highlights political, policy, funding and resourcing considerations and raises
awareness about the true impact of scrutiny, diminishing funding and limited resources for the majority of non-metropolitan police forces.
**Research Insights Overview**

“For without observations and experiments, our natural philosophy would only be a science of ‘terms and an unintelligible jargon’”—John Theophile Desaguliers (1745) Course of Experimental Philosophy

**Introduction**

Following analysis of the data gathered during three years of field immersion at Bedfordshire and Hertfordshire police forces the research insights are presented in the next seven chapters. Some of the insights contained within this thesis were previously presented at the 2020 European conference on computer supported cooperative work (ECSCW) doctoral colloquium and at the 2021 British society for criminology (BSC) annual themed conference on challenges of social and global justice in the context of crime and harm.

The extended insights presented here are organised into two parts across seven chapters. The first part includes ethnographic insights and the second analytical findings of soft systems methodology.

Part 1 begins with police praxis, presenting insights into the way of life at the police forces studied, characterising social interactions, contextual relationships, and communications in the line of duty. The second chapter contains categorised insights related to the **typification of the police information and communication cycle** which includes themed insights into the meaning making around information, data, and knowledge (and intelligence) in the police force as understood from expressed lived experiences and observed in activities, practices, behaviours, and process led procedures.

The third chapter contains insights related to the **structuring of police knowledge** in the context of organisational knowledge and police knowledge as an expression of working knowledge of policing. The fourth chapter, **construction and reconstruction of police**
information systems presents insights into the meaning making, views and perceptions around the adoption and use of information systems.

The fifth chapter, collaborative and cooperative traditions in policing delivers insights into the interactions, collaborative working, practices, and procedures involving communications, information and knowledge exchange and use of information systems and technologies in cooperative situations, such as the work with external agencies and joint working scenarios which involve other emergency services.

The sixth is self-actualisation in times of change, crisis and upheaval outlines providing insight into the lived experiences about the impact of the pandemic on use of information, engagement with technologies and working practices around risk predictions and decision making. The seventh chapter is the soft systems methodology – analytical findings includes summaries and recommendations concerning selected problems that emerge from the application of soft systems methodology. The seven chapters articulate perspectives, views, processes, and practices of police officers, improving on and enhancing previous characterisations of police work. They provide insight into police practices as seen through the eyes of those who do the work contributing to epistemologies of policing with respect to use of information, communication, and use of information systems for risk predictions and decision making.
Chapter 7: Police praxis

Practices form the chief context of social orders by molding action and meaning—that is, by helping to shape the practical intelligibility that governs activity and by carrying that, in accordance with which the meanings of arranged entities are instituted. (Schatzki, 2001 p56)

The practice of policing as observed at participant police forces involves many activities, people, events, and technological artefacts. These activities, people and events were in a revolving process, interacting with technologies and other artefacts, leading to a constant structuring, and restructuring of purposeful human activities related to management of risk and risk decision making. The activities involved interactions and communication between police officers. It also includes their interactions with citizens, with external agency and designated police staff and technological and non-technological artefacts in the line of duty.

Police praxis is organised into six thematic categories related to operational police work.

1. Insights into activities and practices related to preparing for policing duties gathered during observations of police officers and police staff in various areas of operational policing.
2. Insights into day-to-day routines involving receipt and use of information and communication within the police force in the context of risk management and decision making.
3. Insights related to the management of calls for police assistance outlining understandings elicited from observation and interviews in the police force control room.
4. Insights into police response and intervention in response to calls for assistance as observed and learned from the observation of police response and intervention officers.
5. Insights into the police custody practices as seen and told from perspectives of response and custody officers.
6. Insights into the practices and work of specialist departments through interviews and observations of staff in multiple specialist operational policing departments.
7.1 Preparing for work – being in the know

The insights presented in this section highlight communication and information sharing practices when preparing for work. The interactions observed were noted to be socially constructed by the individuals who do the work. The practices observed emerged as they set about interacting with one another using a range of communication tools and technologies, recording, and sharing information with one another as illustrated in Figure 7.

The force threat level is probably the first thing a visitor to a police site sees if they are observant enough and for me, it was a non-descript rectangular slider sign that I would see as soon as I entered the police premises and went beyond the security doors bounding the staff only area. The signage changed daily, and it reflects a communication practice and an indicator of resourcing levels that informs staff and police officers in their roles. The police force threat level sign is a prominent means through which police leaders can communicate throughout the ranks and assert their awareness about the pressures they anticipate the force might face. Apart from informing officers and staff, police leaders indicated that it should bridge the distance between senior police officers and junior police officers by communicating their awareness of the pressures of the job.
Figure 7: A digitised field note excerpt of internal daily communication practices
Although perceptions and views gathered from police constables indicated that they recognised the importance of communication they considered the use of a force threat level sign an inadequate means of informing officers of what business leaders were doing to improve or ameliorate high demand conditions. Many constables explained that being aware of anticipated demand has negligible effect on the complex and dynamic nature of their work, suggesting in several instances that it is difficult, and perhaps precarious to rely on this as an indicator of workload.

For sergeants in level 2 team-leading roles, the concept of communicating and sharing of information related to resource levels was more meaningful than the force threat level and a way to make informed decisions and plan ahead. They also shared the view that the force threat level was a meaningful indication of business leaders’ awareness of the current work conditions and workload. Many of those interviewed said it did not really have that much influence on their perceptions. Additionally, knowing the force threat level on its own did not translate into being kept informed or being aware of what their workload might be.

Many sergeants expressed appreciation of the interest the senior/leadership teams had in their summaries of notable events; however most alluded to this being indicative of leaders seeking the information they need to make decisions that inevitably affect the lower ranks by tasking them with administrative duties rather than coming into the operational work environment to do and experience the work conditions themselves. The majority also asserted that they habitually accept that workload is not fixed and can change on the basis that incidents often unplanned and unpredictable.

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20 A police constable is a level 1 sworn operational service delivery officer tasked in the main with local patrols, responding to reports of crime, threats of harm or risk of injury or danger to persons and property including intervening as required and permitted by law.

21 A police sergeant is a level 2 team/technical lead supervisor who ranks above a police constable and below the rank of police inspector.
Inspectors and chief inspectors differed in their opinions. From observations, this was due to the more administrative and supervisory nature of their roles. They expressed the view that sharing notable events of the day and the daily early briefings before their shift made them feel included and considered in force wide decisions overseen by superintendents and chief superintendents.

Several indicated that sharing information using a computerised database could improve the tracking and review of historical summaries and support back-casting and analysis. They also felt that the shared daily summaries and briefings provided them insight into situations in other departments, enabling them to act on those that are linked to or related to the work in their own department. Overall, they preferred the togetherness and opportunity to discuss, considering this a means of sharing expertise and knowledge and an accepted way of doing things.

For superintendents in level 5 force-leading roles, the daily briefings and meetings were considered an opportunity to learn and review the operational challenges of the previous day and act or respond to any risks arisings which might affect resourcing and legitimacy within the communities they serve. Some superintendents noted that the shared daily updates gave them a sense of persistent problems and concerns and afforded them the opportunity to consider and plan ways in which they could address those problems innovatively in the long term.

"What we are working toward is to harness the benefit of having shared systems and to build this into our control room and response capability. If we are able to introduce a single

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22 An inspector is a sworn police officer in a level 3 manager/expert, one rank above a Sergeant (who is a level 2 team/technical lead supervisor) and one below chief inspector who is also in a level 3 manager/expert role (outranking an inspector by virtue of knowledge and experience and or length of services)

23 below chief inspector who is also in a level 3 manager/expert role (outranking an inspector by virtue of knowledge and experience and or length of services)

24 A superintendent is a level 4 service function leader with more knowledge, experience, and time in service, ranking above chief inspectors, inspectors, sergeants, and constables

25 Chief superintendent is a level 4 service function leading police officer with more experience than a superintendent ranking above superintendents, chief inspectors, inspectors, sergeants, and constables.
system that can link all of the data coming through the departments, support self-service. Something that hooks into all information systems, Athena, Storm, and so on so all data can be queried, and we can login and check into the system to get up to speed with everything. But you can’t take away from the day-to-day discussions, those remain important because nothing is absolute or fixed.” – Superintendent – Bedfordshire

For some superintendents, the opportunity to spend time with the lower ranks and perform their duties was anathema, something seen as an earned right, having advanced beyond taking on duties that were only for those below rank. At the same time, several others they felt that they were adequately informed about work conditions by reviewing work logs and the briefings.

For superintendents in level 5 force leading roles, the daily briefings and decision maker meetings were considered an opportunity to learn and review the operational challenges of the previous day and act or respond to any risks arisings which might affect resourcing and legitimacy within the communities they serve. Some superintendents noted that the shared daily updates gave them a sense of persistent problems and concerns and afforded them the opportunity to consider and plan ways in which they could innovatively address those problems in the long term.

For some superintendents, the opportunity to spend time with the lower ranks and perform their duties was anathema, something seen as taking on work that was not aligned with their rank and an earned right given, they attained their role by doing the work done by the lower ranks to begin with, only progressing as a result of accruing experience and passing gruelling physical, written, and oral exams. Many felt that they were adequately informed about work conditions by reviewing work logs and the briefings and indicated they would enjoy the opportunity to work ‘hands-on’ with the lower ranks. In the same stead, they explained that they recognised that their presence could be disruptive or unproductive, given the
hierarchical nature of the organisation, and such actions might be perceived as micromanagement by the lower ranks.

7.2 Day to day – communicating about risk and decision making

Such is the nature of policing that any event whether it be a local emergency or public order incidents such as a riot, football match, a manhunt or a stabbing or even a vulnerable missing person or a county wide incident such as multiple instances of the same or different criminal activities or a planned tactical operation or a national emergency or crises, such as terrorism, or a pandemic could change the policing duties of the day.

During the observations at Bedfordshire and Hertfordshire, each incident that required a police action or response was accompanied by risk concerns. The police officers observed organised their response around the information they had to hand about any risk of harm or danger to in the context of the location, the suspected offender, and the victim.

The location of an incident was treated as an entity on its own whose characteristics were critical to the risk decision making process. Information about who lived there, what incidents had taken place there and how often police had attended the location provided knowledge that was used to inform decisions about the threat of harm or risk to the police officers and risks to the victim.

When observing the operational work by the force control room and the police intervention/response officers their purposeful activities focussed on determination, planning, and containing the known and unfolding risks associated with the police response. Police officers had different workloads and goals but similar practices to control room staff

Workers in both departments expressed collective views that they regard information as a valuable tool and resource. They were observed discussing, analysing, and making decisions on the response to each incident by determining risks of harm, danger, ongoing threat to life
and or property that the victim may be experiencing. They observed certain protocols when storing information, using short focussed descriptive statements to record answers to questions.

They were also observed collecting and weighting information from various sources, sifting and retaining information to gain an understanding of incidents. This served the purpose of informing, aiding, and supporting decisions. It also enabled them to complete other processes such as case building and or submitting referrals or reports.

While conducting observations in the control room, call handlers were seen using information systems to search for details across multiple databases. They would look up particulars of the location and the people the incident related to. A summary of what they find would be recorded with the details of the incident to ensure the right help was sent.

They extended the practices for decision making and evaluating risk of harm to all the factors connected to an incident in the same way, assessing risks posed to the victim, members of the public and attending officers.

“We need to know what we are going into, sometimes what does help, is for us to know, to understand what is going on in other departments. Some don’t put the intel on the systems, in quite the same way as we do, sometimes community don’t share everything, so we don’t know exactly what we are going into” – Constable Hertfordshire

When observing the police officers, the awareness of what they might encounter at the incident location provided them with the capacity to prepare ahead, to make accommodations and demonstrate oversight. When observing their coordination of public order work, it was evident that their cooperative information sharing depended on compliance from citizens, business owners and other public services and their ability to communicate and maintain a rapport with members of the public.
Vignette – Responding to Calls about disturbance and Breach of COVID laws

In one such instance, police were sent to an address in response to a noise and COVID regulation breach. Prior to going to the location, the officers were able to check and obtain some information that gave them insight into the incidents related to the residents and incidents linked to the location. The officers also knew the locality presented with hostility toward police from experience.

On arrival, my first observation was that the street was quiet, however this was during the pandemic lockdown period and there were restrictions on socialisation. As soon as we pulled up outside the address, the occupants came outside to shout at the police. They were seemingly prepared for a standoff and made several assertions regarding the unlawfulness of police presence.

As I looked around, I noticed that one by one, many of the doors in the surrounding area opened and as if on cue, one person would emerge from each house, stand on the street and stare at the police in a passive way.

It was evident there was not much the officers could do, we endured the abuse and hostility, then the residents were advised to behave in a considerate fashion, but all in all, the call was about an act of disorder, antisocial at the very most, but not criminal and fortunately for the resident, not in breach of the COVID regulations at the time which prohibited fraternisation except between family members.

Interestingly, after some attempts to speak to the resident who had been reported for breach of the peace, the officers chanced upon another group of individuals attempting to enter an address together.

The resident of the house they made to enter denied knowing the errant guests immediately asked, and in the silence that ensued, they were escorted to the end of the street with the
onlookers increasing a little in number. Those who came outside remained there until we departed. It was quite clear that if they chose to surround the police car, they could have done so easily, and we would have been outnumbered. It also became evident the passivity itself was the worrying thing and as we later discussed, it also worried the police officers.

“We can never get any information out of them, .... Someone has called the police today, but as it so happens, if something was happening here and we try to speak to them, go door knocking see if anyone saw anything, they won’t say a word, yet, here we are, this is what they do, if we come here, they all come out to stare us out, it’s not the place you want to come if you’re not double crewed” - Police constable – Bedfordshire

What was evident in their practice of responding to incidents was that the most important thing, arguably fundamental was to have information. It was clear from expressed views that the value of the information was dependent on experience, context and understanding. How information was used depended on a subjective and practiced capacity to spot what was important and relevant. It was also evident from observations that information was understood to be important for them to prepare and take the relevant approaches when attending an incident.

When I discussed with an Inspector later, the inspector admitted this experience was not uncommon.

“We need information to act on anything, if no one called us, we would never know anything, but then when they do, we need to work out is this information valuable, is there something we should act on, is there a risk, is anyone harmed or about to be harmed...” Inspector Bedfordshire
While enquiring about the importance of communication of risk and knowledge (know how) when contending with closed/anonymous/hostile informants as well as the contextual value of communications between control room staff, response police and the public; Insights highlighted the awareness police had of the dependency they have on information. Furthermore, they depended on a mix of tacit knowledge gained from presence in communities and non-tacit knowledge stored on information systems.

“When there’s those moments where we are not rushing anywhere, driving around, walking around these neighbourhoods, we learn an awful lot, we get to know what the area is about, so when we have to go there on a job, we have an idea what it’s about” – Police constable – Bedfordshire

“Figuring out the risk of harm, the risk to us as officers, is our bread and butter, you have to spot changing situations, changing behaviours and think about the information you have, then you have to think PACE26, do I have grounds to do anything, it’s not enough to want to do something” - Constable Bedfordshire

Police officers and force control room staff indicated that the risks they encounter are evaluated mentally, using physical manifestation of events, documented knowledge held on information systems, acquired knowledge received from informants and situational information determined while on the scene of an incident.

When they assess risk based on what information is shared with police and information known to police through previous contact or awareness and knowledge of the location, victim, or offender, decisions that are made relying on their experience of using the information and knowledge they have and their experience of police practice.

26 Police and Criminal evidence Act of 1984 – an act of parliament that sets out a unified legislative framework clarifying the powers conferred on sworn police officers and the codes of practice related to those powers including powers to enter and or search a premises, stop, and search, arrest, detain, investigate, identify and persons suspected of a crime
“We need to know the risks, we need to know what we are going to, everyone will have their own way of doing that, of carrying out the job, but you must think about things carefully. For example, when planning a tactical operation, we need to know the full details to make sure we reduce the risk to ourselves, other people at that location and so on, we need to plan when we are going to make our move. For instance, say a case is about possession of arms or weapons, and the person of interest has a car, and they live with a family of seven, at this level of work as a DCI, I should know that I should know they drive it and park on a certain road. And then the risk you know, it’s diminished if we arrest the person away from their family home. If I didn’t know that and we go in there at 5 am and there’s a pregnant woman going into labour and the wanted person isn’t there because they’re parking their car and somewhere else, well that’s not good enough.” – Detective Chief Inspector – Bedfordshire

Rather than being constrained to the initial risk evaluations and decisions that were made at the onset risk evaluation as seen in practice, is adjusted on an ongoing basis depending on the information that is provided to the police during the call for assistance, and it is further evaluated should more relevant information become known.

“The risk from the control room, what they tell us to look out for; it’s not fixed, it depends on what they know. By the time we get there, it depends on what we can see going on and what we find out, or more like what we can find out. – Constable – Hertfordshire

“We can get information and we think we are going to get there and find chaos and must arrest someone, but we can’t decide that, not till we get there. It’s not like the control send us to the incident and tell us what to do when we get there, sometimes they do, but it’s not down to them to make those decisions, it’s down to us, it’s on us what decisions we make, so you need to go there and get the information right before you do anything” – Police constable – Bedfordshire
Officers were seen taking an approach of arriving at an incident and enquiring first about what was going on where possible. In some instances, we would arrive to a fracas and gathering further information would be limited. In such cases, they would start with deescalating the fracas before establishing what was happening as told by each person involved. Once they acquired more information, they would then enquire some more to establish where necessary if there are any witnesses, or evidence and ask more questions of the people involved about continued threats or risks.

Following this they would often check details with the force control room and sometimes request checks or conduct checks on their phones. Many explained that the checks were an important way of getting information or checking information that might help them identify individuals or help them to corroborate details. Then they would proceed to inform the parties of their decision.

“Everything is risky, but with the job, you have to think twice about risk, because there are specific ways you are expected to react to it and make decisions about it, you can’t call control to ask what to do, they only know what was happening before you got there, you have to think of your own safety and then think of what is happening, make decisions really quickly” – Constable – Hertfordshire

“The thing with figuring out what risks there are, not everyone ends up happy. Sometimes the risks you can see unfolding and the risks you already know about which sometimes they (citizen or offender) won’t tell you about, but you know because it is on file, then you have to be careful, because what is on file might not be how things are now, but in the end, sometimes it’s the person thought to be the victim who has actually committed offences, it’s hard to explain the risks you evaluated to them, to explain you can only act on what you know, and what you can see” – Sergeant – Hertfordshire
During observations, officers shared how these decisions are usually made following legislative and approved practice guidance such as the national decision model (NDM\textsuperscript{27}) and the national intelligence model. It was evident from signage and posters around the police report room and clear from what the officers explained that putting the national decision model into practice is a cyclic process.

On enquiry several described it as ‘the process of learning about situations, gathering more information to gain clarity and then making decisions’ regarding each matter arising. In observation, the focus for most officers was to discover who (or what) was in danger and if there was any need for police involvement

“yes, people sometimes exaggerate, and sometimes they also downplay the risk of harm, the injury they may have suffered or the danger they are in, but when we get there, there is a limit on what we can do, we still have to get those facts, and we need to make decisions not only on the risk, NDM, it’s about every decision from attending the incident to deciding if there is a police action to take, then you take that action, you have to think what risks will there be because of that decision, the risk to us as officers, the risk to the victim, the risk to the offender, and when you make new decisions on the risks of the previous decision you made about the risks and it goes on and on, it doesn’t stop” – Sergeant – Hertfordshire

With prior knowledge of the national decision model, it was my understanding that the NDM cycle requires engagement with the police code of ethics while gathering information, assessing threat and risk to develop a strategy, and evaluating applicability of police powers and policy. It also requires consideration of applicable and appropriate options and contingencies before taking an action and a review of the action and incident.

\textsuperscript{27} The national decision model A decision making model used in policing to set out and review the rationale behind the actions they take during an incident. The model involves six phases of action requiring engagement with the police code of ethics when evaluating risk and making decisions in relation to incidents see: College of Policing (2014) National decision model.
“The decisions we make are not just based on information from the control room, they’re also based on PACE and the NDM. Okay the control room THRIVE a job before sending us there, but we have to THRIVE it again and despite that we have to evaluate what is happening” – Police constable— Bedfordshire

When attending incidents with police officers, situations were often not simple and straightforward. Often, events would unfold quickly presenting multiple facets to a single incident. There would often be more than one person involved and sometimes there might be more than two police officers present.

“Yes, we are responding based on the intelligence we have, the information we were given, and this is most likely based on implied or suspected risk of harm, so our response is in the first instance to prevent harm or remove a threat or eliminate a risk” – Constable Bedfordshire

“It is not that absolute or fixed, how one person understands information is not the same way another will, so it is to some extent about having a way to get to a scene, assess, get a clear picture, get better... more info out of the situation and make the ‘hopefully’ best decisions.” – Constable – Bedfordshire

On paper, the NDM cycle looked to me to be a process requiring time and input from several sources alongside knowledge and experience, and not something that could be done quickly and expeditiously by police officers as observed. I enquired as to how it could be possible to evaluate things using the written guidance.

“You have to know the risks, you have to think PACE, then remember the codes of practice, then think quickly, it’s not steps to follow, it’s things you must do as a routine, things that need to be done, to make sure everything is done how it should be done, make sure nothing stops you from doing the best for the victim.” – Police constable— Bedfordshire
“Well, they’re not going to turn up there and start ticking boxes and noting things down, it’s not a risk assessment about an office chair, for that, you’ll probably be waiting for H&S for a while and when they turn up, you’ll get a standard chair, it’s what’s on the budget. For incidents, it’s about thinking quickly, being observant, knowing the policy and practice, they learn that in training and for everyone it’s a constant learning thing to make decisions quickly and correctly because you don’t get a second chance” Sergeant – Bedfordshire

Overall, at the two police forces, the staff expressed understanding and regard for the value of the information they needed and acquired, considering it important to their job. Information was described as the key to the work they do and several confided in the importance of learning and discerning as they worked with information.

During observations and enquiries, my questions and observations eventually led me to conclude that the practice of risk prediction and decision making at the police forces could be described as a categorical use of information to identify risk of harm or danger, threat to life, or valuable knowledge and the actions taken to contain the risk and record the information to support crime management.

7.2.2 Practice overview – Communicating about risk

Incidents in the preceding day or those unfolding by the minute or hour could directly impact on any of the police force’s threat levels\(^ {28} \), here where a high threat level would indicate resources are stretched to their maximum capacity, a medium would indicate resources are in persistent demand but not at maximum capacity and a low would indicate what could be described as a quiet day.

“Shh, we don’t use that word here, you already know that it’s busy enough as it is, if it all goes haywire, there’s not enough of us here to do everything, we’ll end up with control

\(^ {28} \) The term Force threat level is used to describe the balance between demand for police services and resource availability
sending us in one direction and when we are halfway there, they’ll redirect us again to a bigger priority,” – Sergeant – Bedfordshire

During each shift in the force control room, the response team sergeants, the police force custody sergeants and specialist department sergeants and respective inspectors, collate information as their shift, information is collated as the shift goes along.

In the force control room (as observed at Bedfordshire police force) information that is collected relates to three key areas, any incidents of note or complexity, incidents related to knives, guns and or weapons in which an individual has been injured or killed, incidents where there has been a death, incidents where there has been discharge of a lethal or non-lethal firearm by a police officer.

The staff record also record any incidents that required joint working operations such as fires, car accidents and incidents that involve complex operations and incidents (requiring a command structure and attendance of a bronze, silver, or gold commander). Additionally, the staff note and record call volumes for emergency, non-emergency and follow up calls and investigations.

This information is collated and summarised within a handover memorandum which is updated throughout the shift. At the end of the shift, the inspector on duty shares the information in handover to the next inspector who takes on the next shift. Copies are also

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29 The force control room is the police force call centre where emergency and non-emergency calls are received. It is often collocated (as in the case at Bedfordshire) with the criminal investigations’ bureau (a team that handles calls to non-emergencies, to gather more details, and book appointments for police attendance. for incidents where there is no need for an immediate response) and the data quality assurance team, who check information system entries on reports, referrals, and case files to ensure that they meet the standards required.

30 An inspector is a sworn police officer in a level 3 manager/expert, one rank above a Sergeant (who is a level 2 team/technical lead supervisor) and one below chief inspector who is also in a level 3 manager/expert role (outranking an inspector by virtue of knowledge and experience and or length of services).

31 A complex police operation or police incident is one where there are several elements involved. It could also be an incident or operation that involves the deployment of police officers across police force boundaries.

32 A nationally accepted generic command structure for setting out responsibilities and accountabilities used by the police and other emergency services. The command structure sets out the chain of command that will be adopted for a local, basic command, officer and staff, partner agency or government operation or incident involving the attendance of the police force.

33 A temporary operational command structure designation used to denote a police officer who is responsible for carrying out responsibilities and managing a group of resources related to a tactical incident plan. A bronze commander is an operational commander managing operational response, A silver commander is a tactical commander managing overall tactical response and a gold commander is responsible for overall command of the tactical and operational aspects of the plan.
sent to the command-and-control chief inspector, the command control superintendent and the leadership team at the police force including the chief constable and assistant chief constable.

Observing the control room inspector, I noted the process of collating information is iterative, led by experience and mediated by experience of communicating information in a specific format. Crime details that could fill several pages are summarised into one or two sentences loaded with key descriptives that give a quick snapshot on the criticality, relevance and actions taken or pending.

“The superintendent and chief inspector, even if they come in here, it might not be that easy for them to find out or see what is going on. They need to make the right decisions and get the right level of staff in for us. As we go through the shift, it becomes second nature to recognise these incidents from experience and make the right brief notes that will allow the leadership team to see what the day was like at a glance. You can’t add too much detail, you just need the key information in a clear format that they will understand quickly.” - Oscar 1

Control room inspector Bedfordshire police (in response to my enquiry about daily summary memorandums)

The police force custody suite sergeants also collate information about notable incidents such as critical emergencies (e.g. a person seriously injured or death), high risk safeguarding concerns, persons in temporary custody whose continued detention may require the approval of an inspector (should it be evident that a citizen may need to remain in custody beyond the time of 24 hours as specified by PACE\(^\text{34}\), 1984), incidents that have required hospitalisation of person in custody, persons in police custody who present with or have

\(^{34}\) Police and Criminal evidence Act of 1984 – an act of parliament that sets out a unified legislative framework clarifying the powers conferred on sworn police officers and the codes of practice related to those powers including powers to enter and or search a premises, stop, and search, arrest, detain, investigate, identify and persons suspected of a crime.
known high risk indicators and any incidents considered to be of note using a virtual whiteboard.

“More than ever, we need to make sure we are following protocol. We have a police medic on site, but it does not mean much if you don’t really know them, not just their name, who you put in a cell, are they vulnerable or if their PACE clock has not been monitored. We have those customers who come here, and we can tell from the records that they present certain risks, we have to check that. Sometimes, they make disclosures to officers that indicate there is a risk if we keep them here, we need to address that. But overall, what we do need to do is to let them upstairs know who presented a risk on arrival and is still here when the day starts. And we need to let them know and make sure we record anyone who has left us, but is still deemed a risk, because we are now one of their ‘last agencies of contact.’ Most of this goes on the system and the Inspector will summarise it, but also the leadership team can access and view our digital whiteboards to inform them of what space we have and who we have in. – Custody Sergeant – Bedfordshire (on communications that start the day)

This information is often shared verbally during handover to the next shift sergeant. It is also available to the custody inspector, who will distribute and discuss relevant aspects of the information with other senior police officers and the force leadership team.

In the police response department, duty sergeants and Inspectors were also tasked with collecting and collating information related to incidents and events of note. Some of the information is received in person from officers and staff, however the Sergeants and inspectors also consistently accessed the information systems to keep abreast of the ongoing work and they could see incidents of note and who was assigned to it and follow the lifecycle of the incident.
They would note this on their whiteboards in custody and in response, simultaneously transferring the information to briefing memos throughout their shift. In the case of the control room, the inspector would note the incidents from the information system using their knowledge from involvement in the decision making and monitoring to aid the task, including information that indicatively impacts officer numbers and resources. The report will contain deficits in response capacity such as short numbers of emergency response, armed and taser trained officers.

This includes serious and critical incidents of note and incidents involving knives and weapons. It also includes critical information about crimes that have been attended to or that are ongoing which are particularly violent such as serious assaults, incidents involving the use of forced entry and or weapons by police officers and officer abstractions\textsuperscript{35} during the shift of work.

This information serves a few purposes. It is shared with sergeants and inspectors in face-to-face hand-over sessions when a shift ends, and a digital copy is also shared with the chief inspector and superintendent for response policing and the chief inspector for the specific area command where relevant. Some of the information of note may also be included in and sent to other partner agencies in the form of a referral.

Specialist departments such as children and vulnerable adults, domestic violence also follow a similar process for incidents of note; however, the procedure is slightly different. Case updates are the norm in these departments, with information curated about serious and notable cases not only to inform leadership teams and enable some planning ahead should resources be required for arrests, execution of warrants and any tactical operations but also to inform and guide the police force representations to the press and media.

\textsuperscript{35} Officer abstraction is a term used to describe the unavailability of a police officer. An officer on extraction is usually on guarding, protecting or administrative duty and unable to participate in active patrol and response duties.
In each of the two police forces, the chief inspectors responsible for different community areas also contribute some information. Their work focus is the local area policing teams or community policing teams. From observations and discussions, there are some areas of work in community policing that indicatively give rise to some risks of working in silos. Not all intelligence is recorded on systems, and not all systems have good interoperabilities. Insights from community policing inspectors gave the impression that the problems could be due to local knowledge of individual officers not being passed on.

The chief inspectors for community policing indicated that they need to be abreast of and have summaries of any arising matters that could potentially affect policing for the day. They will often prepare a summary that gives a clear overview of issues that may impact police demand and require risk containment or collective decision-making by senior police officers.

“So, we have to network with a lot of different teams, we give a lot of attention to MISPERS\textsuperscript{36} and cases involving mental health concerns. Sometimes, these two are connected. We still keep on working with the community partnerships to find a way to contain or manage issues, but on a day-to-day basis, even if we have all our information on ASPIRE\textsuperscript{37}, we still need to be quite aware that it cannot do the work of containing risk and make decisions when the problems come. The key thing is that a lot of emergencies related to these groups happen at night, especially the high-risk cases. So, we have to know and highlight any ongoing persistent or repeated incidents, get that information out there to all the leads, so we all have an idea of what we will do.” – Chief inspector community policing Bedfordshire (on preparing for the day of work)

The police force analysts are also called upon sometimes to contribute information that will be shared in the daily force meetings. The information they work with and analyse is dated

\textsuperscript{36} MISPERS – a term/acronym used to describe persons who have been reported missing.

\textsuperscript{37} ASPIRE is windows-based spreadsheet database system used for collating and sorting data retrieved from WebStorm. In community policing it is used for risk scoring, flagging risks and mediating decisions about and around community policing concerns such as vagrancy, shoplifting, loitering and other antisocial incidents in local police areas.
and collated in a different way from the information from the operational departments. They
often aggregate force demand data and community policing data over time to support
discussions and help plan for anticipated demand for police services.

Analysts indicated that they were aware of the importance of their role, which they described
the process of working with various pieces of information and data as one that required a
measure of attention. They were not only computing information for use by leaders, but also
involved in evaluating and computing criminal links and profiles for persons of interest or
concern including youths. Some of their work also involved reconciling ASSET\textsuperscript{38}
predictions.

“We have to work with drawing meaningful information from intelligence to support
decision making.” – Analyst— Bedfordshire

Perspectives shared indicated that the analysts were aware of the need and demand to do
more with the information received through operational policing.

“Our biggest focus right now, .... we know, we are aware of the pressure to use this data we
have to plan ahead, to inform leadership teams, so they make decisions around resourcing
and tactical plans, work to support them in being proactive, but we need the data to be
accurate, we need it to be correct, we need it in good time, and we need to get it out in good
time” – Senior analyst— Bedfordshire

Assigning the threat level for the day lies with the police force leadership team. The threat
level assigned for the day or part of the day is highly dependent/reliant on the summary
information shared from core operational departments and specialist teams, supplemented
by information from analysts that support interim and long-term planning discussions should
need be. These communications and the collation of notable and critical events and resource

\textsuperscript{38} A youth justice recidivism tool that uses twelve static criterion to assess the potential for youth recidivism.
issues shared between sergeants, inspectors, and chief inspectors in the line of duty are therefore important practices within police forces.

The inspectors, chief inspectors\(^{39}\) and superintendents on duty each day, including the assistant chief constable\(^{40}\) and chief constable, would have received a dossier with the summaries from all key operational teams overnight. The information allows them to review and consider approaches to manage work arising because of the information or ameliorate concerns as a result of the same.

Inspectors and chief inspectors on duty will often conduct their own review at 7 am via phone meeting. The Force daily briefing meetings take place between 8. 30 am and 9 am via phone conference providing senior police officers with an opportunity to hold discussions about risks and issues, share expertise and make professional judgements and decisions about the level of resources that will representatively enable the police force to function adequately during the day.

“Our main priority is WebStorm demand, updating everyone on what we will do, clock issues in custody, managing abstractions and then factual discussions about incidents, basically informing each other, and looking at force critical management issues, seeing where there are risks of resources being inadequate, reviewing ongoing incidents” – Inspector Bedfordshire

They discuss the notable events in the preceding shifts, the anticipated demand level based on planned tactical operations, and planned national activities such as the arrival of a person requiring police protection. This could be a key member of parliament or a member of the royal family and anticipated events such as football matches, public protests, or any other

\(^{39}\) A chief inspector is a sworn police officer who is in a level 3 manager/expert role (outranking an inspector by virtue of knowledge and experience and or length of services) and ranking below a Superintendent (who is a level 4 service function leader with more knowledge, experience, and time in service)

\(^{40}\) An assistant chief constable is a sworn police officer who is level 5 force leadership role ranking above a superintendent and ranking below a chief constable (a chief constable is also a level 5 officer, but has a more senior position, knowledge, experience, and years of service)
activity that may impact the demand for police attendance or services. They apply knowledge and experience about demand levels and consider the resources available such as control room call handlers, response police officers, armed police officers, and other resources such as vans and cars.

“When we attend these meetings, it is really important to know, to have a plan of some sort about how my teams will work best, how are we going to get through the day, what numbers do we really need, how many officers are on a four-day rest that we can actually call in, then you think what if something suddenly happens, what do we do. In an ideal world, we could have all this as analysed data at our fingertips with technology doing all the work, but actually, it is about moving people and resources around, thinking on your feet, being quick to innovate and think up solutions that leave us in a good position where we respond to all calls on time.” – Response inspector Bedfordshire police.

Next, they agree on a contingency plan which may include drafting staff who are off duty to work, seeking a loan of officers from neighbouring police forces, or commissioning the release of more resources.

“We can go from 0-1000 quickly. There are different people managing risk at all times, but Senior managers need to be in the know about public confidence issues and high risk.... so, if there is an issue, press may have an interest. These discussions in a fluid environment mean we have oversight and a comms strategy, so we have to consider what to do to provide reassurance which could sometimes be more visibility which is budgetary because you have to find more resources which costs money” – Inspector— Bedfordshire

Finally, a force threat level for the day ahead is agreed upon. The force threat level could be high, indicating there is a likelihood of significant strain on resources or that resources will need to be carefully managed. It could also be medium, indicating that resources appear
adequate but will need to be monitored or low, indicating that the resources are sufficient to meet the anticipated demand on police resources for the day.

The force threat level sign constitutes an important strategic communication tool for staff coming to work. Almost all officers arrive at work wearing civilian clothing. For constables, the typical first task was getting into their uniform and attending briefings for the day. Following briefings, they would often go straight to their cars, remaining tuned into the airwave radio for the rest of the shift.

“We don’t just attend the senior officers or inspector’s briefing meetings; we must network throughout the day and also link in with the chief inspector. Even though they are off duty in the late hours, they are still on call. In areas where we have a busy job of containing revellers and nightlife and in situations where we have a lot of high critical incidents, then the risk levels for the entire force become a thing of hourly or on-the-fly updates… the constant evaluation and re-evaluation, how do we contain this risk or that, decisions, do we have enough staff, are we working to approved professional practice, what is the best approach, it’s ongoing, and of course, with just three of us instead of one per borough, or maybe one inspector per 2 areas, there is a lot to cover, and there are overlaps, so we keep on to each other on the radio. ” – Response inspector— Hertfordshire

For constables, the force threat level sign gives them an idea of how busy it might be, and it also gives them an opportunity to plan. Their workday is usually spent on the road, but they are also tasked with administrative duties such as completing case files for cases that are handled by constables and preparing case files to forward to specialist departments. Many expressed that they also prepare statements to attach to files, attend court and inquest hearings if summoned and follow up on incidents that require a second attendance.

“Once I come in and see a high threat level and then go into briefing and it’s one flag after another, we have to look out for…. I know before I get on the radio that I am going to have
to either have a word with the sergeant to take me off air for a bit, so I do my admin, or I have to fit it in between calls which is nearly impossible, or I have to wait till my shift is ending. If it is a weekend shift, then I might get a bit of time in the last two hours because of the staggered shifts. If it isn't, then I have to plan; either way, at least I know that as soon as I get in, and I can raise it right after briefing. But the thing is right, either way, for us on response, the risk is not fixed; the risk and decisions we make revolve around the information we have, not the threat level; it's the intelligence on the systems and what happens wherever the control room send us.” Police constable – Bedfordshire (On preparing for work – practices)

All constables I spoke to and observed at Bedfordshire indicated that they must fit the time to do administrative work around the time they spend attending calls and must complete their outstanding administrative backlog before their rest days. At Hertfordshire, the way of starting the day was also similar, but intervention officers there did not make mention of the force threat level. On enquiry, they indicated they don’t usually see it because their working patterns had changed due to COVID, and they had a different approach.

They had an arrangement put in place to prevent constables working one shift from having contact or mixing with those on a finishing shift. This approach was adopted to prevent herd infection or mass ‘known contact’ isolations. As a result, the constables use separate entrances and not the front entrance of the police station at Stevenage and Watford. The intervention officers would be taken off-grid one hour before their finish time, and the other team would arrive to begin one hour before the preceding team shift ends. The arriving staff would go straight to the briefing room and have no contact with the finishing team. The

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41 At Hertfordshire police, a police constable who performs police response duties is called an intervention officer. At Bedfordshire police, a police officer in the same role is called a response officer.
42 A designated meeting room for police response officers to attend and discuss the policing goals, cases of note, wanted persons and important information distributed via a centralised document from specialist units.
finishing team would remain in the response report room to complete their paperwork and leave.

"Because of the working plans for COVID, you know, if you have to discuss with someone on the other team, it’s going to have to be on the radio. But in a way, we do get to discuss where we left things on our previous shift (without teammates). The Sergeant and Inspectors are kind of clued up on what’s been happening during the previous shift, so we get all that information in briefing. In a way, you get all that information, and you know what the risk is for what was raised as an issue or what is going on in the force area, but that’s not the job. The force threat level is kind of secondary to all that. Besides that, well, even if there’s a threat level, you’ve been here for weeks now, one call and everything changes quickly, so best is just to be prepared, and if you have admin to do, well, you are sitting it out after your shift to do it, it’s as simple as that.” – Police constable – Hertfordshire (on practices – communicating when starting work)

For police officers in supervising and managerial roles such as sergeants and inspectors their role at work is dualized. They spend time at their desk conducting administrative duty and time responding to incidents where their expertise may be of value or attending incidents where their supervisory or coordination skills or attendance of a more senior officer is required.

Depending on their role and their shift pattern, accessing the intranet and email were often not the first things they would do when they came to work. Instead, their first steps vary, with some officers listening to the hubbub on their assigned airwave radio to gain insight into the current situation based on command-and-control calls and radio chatter.

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40 A designated room in police stations for police response officers equipped with desktop computers and a range of administrative supplies. The space is used for completing reports and other administrative duties. It also often doubles as a lunch/break room as is the case at Kempston. At Luton (Beds) and Watford, Hitchin, and Stevenage (Herts) police officers (constables) have a separate common room with some kitchen equipment and sitting space.
“Once I get into the car and head in, I find it helpful to listen in on the radio. In this role, I am going to arrive and go straight to handover. The sergeants who are on duty will definitely tell me what is important, but it will be what they believe is important and relevant based on their own way of approaching the job and their knowledge and experience. I do get the right information, but, listening to the radio chatter on the hour-long drive there or even for two hours before I arrive, it’s almost as if I have been there for the last two hours. By the time I see the threat level as I walk in, I have an idea of what has been going on; I am aware of the high-risk issues at hand and what decisions I might make to manage the workload that is there and what to expect. That way, it’s not like I am being loaded with information. It gives me a bit of time to log in and check on any other issues that need to be raised in briefing” – Response Sergeant – Bedfordshire

For other supervising officers, although the force threat level is displayed in locations around police stations, they may not get to see those signs. Inspectors at Hertfordshire, for instance, are often assigned to more than one policing district. The Inspector on duty at Watford, for instance, is often responsible for Watford, Three Rivers, Hertsmere and Dacorum. A second will be responsible for Stevenage, East Herts, and North Herts area, while a third will cover Welwyn and Hatfield, St Albans, and Broxbourne,

At Hertfordshire, most of the police officers in managerial roles admitted to logging in to the command-and-control system WebStorm⁴⁴, which provides access to the logs of all the emergency and non-emergency calls received. Officers were seen accessing WebStorm and Athena⁴⁵ crime management and information system to get a snapshot view of what is going on in the custody suite and an idea of outstanding case management tasks for their teams.

⁴⁴ STORM is an emergency services command and control multipurpose information system and database. It is used in police force con
⁴⁵ ATHENA is an information and crime management software suite which provides local record management, investigation management, intelligence management, crime management, case preparation and custody management capabilities currently used by police to record local intelligence, manage crime, and case building data and custody intakes.
Several indicated they listen in on the airwave police radio on their way to work to get abreast of the event. Some officers also indicated that doing this prior to coming in or on the way to work helps them to get into the mindset they need to be in to manage their work.

“Sometimes, because I have been online and sometimes on the radio as well in the hours before I come in because I have to cover these three areas, it might be that based on unfolding events, I know that I should actually check in at another site/station instead of this one. I could be here one minute and have to drive across town the next to be at a different location. Sometimes there are three of us covering the entire county; the hard one is when you get assigned to cover some areas in the north and some in the south. If something happens at the other end, you’re rushing up there in the area car. But overall, the radio, WebStorm, Athena, that’s how I get in the zone, get on top of what is happening around my area, especially when we are on Lates, you really need to know what you’re coming in to.”

– Inspector Herts (on preparation for work.)

Conclusively, it was evident from discussions with senior staff that there was an interest in engaging, communicating and being more interactive with junior staff. The general cultural affect, however, was largely indicative of a divide still existing between the ranks.

On communicating, particularly dissipating information that is reflective of the police force day to day adjustments and strategic approaches, it was evident staff understood the importance of sharing and exploiting information for this purpose. However, there was limited understanding of the scope and purpose of data for determining strategic decisions. Staff were more inclined to see the collation of data about their day-to-day work as a means of performance measurement rather than to see it as a means of ensuring preparedness. This was attributable to the limited means of communicating information to the lower ranks, particularly the absence of messages in person or directly from police leaders in interactive settings.
Although many superintendents seen during this research operated open doors, the enculturated views of hierarchical roles such as ‘earning’ a position and ‘outranking’ certain duties and roles meant that communication about issues was not seen as co-ownership of activities, problems, solutions, and praise. Rather, comments from leadership were seen as orders or limited forms of praise.

7.3 Managing calls for police assistance – receiving, risk assessing and tasking

The observations reported in this section took place at the control room in Kempston at Bedfordshire police. The control room staff are all trained police staff with a range of roles and responsibilities. At Bedfordshire, there is at least one and usually up to two police inspectors (Oscar I) who take the lead role in the control room. Oscar I’s are supported by an Oscar II, who is a control room supervisor. An outline of the associated workflows is shown in figure 8. In the work setting, staff are collocated in one large space, organised according to their roles, and others are located in another nearby room.

The area is used by call handlers who respond to emergency 999 calls and those who respond to routine 101 calls to the police force. This includes two radio dispatch operators’ teams, who are tasked with dispatching police officers to scenes of emergencies, one serving the north of the county and the other serving the south of the county. Another team manages online enquiries, messages, crimes reported online, and crimes reported via online chat messages, while a fourth team are tasked with making follow-up calls and enquiries, including booking appointments for police response to reported non-emergency crimes.

The force control room is also collocated with the police data quality team. Experienced staff from the call centre are usually assigned to review case records on Athena to identify and flag any inconsistencies with data entry, such as errors, omissions, incorrect procedural entries, and outstanding or incomplete case follow-up records.
The control room inspectors were observed starting their work shift by completing a face-to-face handover with the outbound inspector from the previous shift. This included discussing the handover notes being prepared for leadership briefings. The briefing notes include incidents related to drug trafficking and drugs farms, violent disorders involving weapons, critical major incidents serious injuries and fatal traffic incidents, high risk missing persons, incidents involving fires or deaths in suspicious circumstances.

Typically, the inspector gets up to speed with outstanding calls for police assistance and evaluates any incidents that are still awaiting police attendance by reviewing the risks associated with them. Following this the inspector checks that operational standards are being met with any ongoing and existing or outstanding work by monitoring the radio discussions and making requests where necessary for reviews of ongoing risk and threats. Attention is given to any high-risk incidents that have been closed as no action or deescalated or flagged as low risk are not errors in response. Finally, the inspector revisits high risk events from the previous shift particularly if they are still active and require input.
Figure 8: an activity diagram showing police call centre workflows in brief
Six streams of work were identified in the control room: receiving and managing emergency calls, managing non-emergency calls, radio dispatch activities, managing virtual enquiries and reports, coordinating response to non-emergency incidents and critical incident response.

7.3.1 Stream I: receiving and managing emergency 999 calls

The first was receipt and triage and management of emergency calls. Calls to 999 are diverted to the relevant police force by BT emergency call takers. When the calls are received, the BT service staff will announce the call and transfer it to a police control room handler. Calls are routed to the nearest police force to the location from which the call was made to 999.

While immersed in the field, it soon became clear that calls that do not fit into any category are routinely diverted to the local police force closest to the location of the call. This included dropped calls, calls that are silent, callers who cannot articulate their emergency, callers who threaten to harm themselves, callers whose needs are unclear and callers who are making repeated calls to emergency numbers.

“We are the call centre central, as it were. If someone dials 999 and does not speak or hangs up, no one assumes they might have a medical emergency like they have been stabbed or a heart attack or a stroke; our officers don’t have resus training, and we don’t know what to look for of decipher” – 999 call handler— Bedfordshire

The team that takes emergency calls also take spill over calls from the non-emergency team. Calls received to 999 are handled in a similar way to non-emergency calls; however, the call handlers are experienced in determining information vital to dispatch, and they will often record the details of an emergency as soon as it is established and then hold the caller on the phone to determine further detail which they then update on the ‘job’.
All call handlers and control room staff routinely apply a risk assessment model called THRIVE. THRIVE is a mnemonic representing the words Threat, Harm, Risk, Investigation, Victim and Evidence. It sets out six steps/evaluations call handlers will conduct when they receive an emergency or non-emergency call. The first evaluation is the identification of a threat to life or property; the second is the determination of the likelihood and level of risk and seriousness of harm occurring.

Next, the risk of harm occurring is evaluated, and the potential purpose or need for an investigation is explored. Following this, the vulnerability of the victim due to factors relevant to the individual and the circumstances are evaluated. Finally, the needs of the victim, including whether there are opportunities to engage with the caller regarding the incident, are considered.

In observations, it was evident that the use of this risk assessment mnemonic helped the control room decide how to treat information and which incidents to prioritise or deprioritise. The THRIVE approach was used as a standardised approach to evaluating risk and harm in all cases where calls are received by at the force control room.

As seen in action, this was not a rigid risk decision tool; rather, the risks would be evaluated on an ongoing basis relying on ongoing situation updates. Additionally, the control room staff would reduce the prioritisation of an incident if another incident came to light or another more serious incident arose.

The role of the 999 call handlers had some unique features. They take a role as motivational discussers, keeping the caller talking long enough to establish the best type of help to dispatch and how much help to send. They also take the role of negotiation by communicating to calm situations. Additionally, they take on a role of resolving/control with a tone and affect that provides some succour to a caller and presents them with a calm input to their emergency. They also take on factfinding activities, asking various questions and
sometimes the same question in a different way to gain more information and determine what was going on.

“Sometimes the calls made to us self-resolve and actually by asking the right questions and remaining on the call long enough, we get to find out there is no need for us to attend or it may be that there are other resources that the individual can use or other ways of resolving the problem” – 999 call handler – Bedfordshire

They were also observed engaged in recording of data, multitasking to search through about eight different databases for information linked to or about suspects or victims and or addresses and phone numbers. These included BORIS\(^46\), PLX\(^47\), the PNC\(^52\), Fed Search\(^53\), Athena\(^45\), Transearch\(^48\) and COMPACT\(^49\)

At other times, their job involved viewing and sharing details from live streamed footage relayed through The Good SAM app\(^50\). The Good Sam app allows staff to immediately receive the exact location of a person who needs help. It performs the role of verification, providing information that confirms an emergency is ongoing and that it requires police attendance. During observation staff would ask a caller for their consent to send a track and stream link to the mobile phone they’re calling from. Once the caller clicked the link the application would be deployed. The caller’s phone would then send the callers exact location and stream video footage of the incident as it unfolds. It enabled staff to observe what the caller was experiencing so they could assess the threats to the caller and the risks involved for the victim and attending police officers.

\(^{46}\) Bedfordshire Open Research Information System (BORIS) is a legacy system that enables access to legacy records for the control room, crime recording systems, custody, firearms, missing persons, and general occurrences at the police force.

\(^{47}\) The police cross referencing database (PLX) is an information and intelligence nominal index system that enables searches for information held by any police force regarding an individual.

\(^{48}\) Transearch is a consolidated database of electronic and physical records related to a person or place. It provides a searchable index of physical and electronic files organised to meet management of police information guidelines.

\(^{49}\) COMPACT is a missing person’s case management system often referred to as (MISPER) The system enables access to case records and history for a missing person.

\(^{50}\) The Good Sam App is a mobile application which police force control rooms can launch on a potential victim’s mobile phone. The staff send a link to the app by SMS and the caller clicks on a link which immediately sends the location of the caller to the police and enables a live streaming video link from the phone to the police control room.
It served as a situation assessment tool enabling the visualisation of an emergency setting, enabling control room staff to gather vital video evidence of an incident as it unfolds. They could then give real-time information to the police officers en-route and record details on their information systems. The information they record in such cases would also be logged as evidence which could later prove instrumental for the delivery of adequate and appropriate support and help to the victim and or assist with prosecution.

Besides this, the 999 call handlers performed the role of lay counselling, giving advice, and lending a listening ear. Overall, the staff expressed awareness of the criticality of their job. The perspectives they provided about their work resonated with the view that their job is to remain on the phone with a caller until such a time as emergency help arrives or risk is diminished enough to end the call.

“The current situation where we are now the ones being called to handle mental health crises, ambulance refuse a call, we get it, well, it leaves us as persons who are not medically trained responding to a medical emergency, where there is a high likelihood and significant risk of loss of life” – Oscar I – Bedfordshire

### 7.3.2 Stream II: receiving and managing non-emergency 101 calls

The second stream of work related to the receipt and management of non-emergency calls and enquiries to police emergency rooms. Calls from citizens who dial police on 101 are routed to these teams. The callers are often facing difficulty and require police attendance for the protection of their property or to enable their safety. At times, some of the calls made to 101 are routine, and as observed, sometimes they are emergencies. Additionally, sometimes the calls received begin without seeming to have any risk or threat of harm attached to them but develop as the call is ongoing.

The staff triage the calls received by carefully sifting information and acquiring information from callers to determine whether there is a threat of danger to life or property. They will
then evaluate whether there is a risk of harm to any person/s and evaluate and assess the likelihood of further harm to the caller should police not attend immediately. They will establish if there is an actual crime or concern which can be contained by police or if there is an incident that would benefit from a police investigation.

Following this, they establish the needs, welfare, and safety of the potential victim/s, and finally, they establish if there will be opportunities to gather evidence should police attend, such as statements or physical evidence. They use this information to make decisions on the level of risk and threat of continued harm, then record this information using short notes on the WebStorm command and control information system and database. This is forwarded to the radio team.

The radio team will evaluate the risk decision made at times, conferring with Oscar I and Oscar II to decide if the risk decision is appropriate; at other times, they will evaluate this themselves and assign a higher or lower risk.

The police forces only have a few police constables staffing rapid response vehicles with the training to attend a call on ‘blues and twos’.” These officers can make for an incident at high speed, while others on standard response cannot go at high speed. Not all officers are taser trained or trained in forced entry either, so depending on the resources needed at an incident, some officers may not be equipped to attend.

7.3.3 Vignette: Emergency or Specialist task— a 101 call

The dynamism of 101 calls was exemplified in a case of an individual who called the police to report the risk of danger and harm to her child. In the end, the police decision was to pass the reported details to a specialist team. A caller informed police of alleged sexual abuse of

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Blues and Twos is a police term used to describe the task of driving at high speed with sirens and flashing lights to the location of an incident deemed an emergency by the police force control room radio dispatchers.
a child and provided the name of the supposed abuser asserting that the child was hiding in a bathroom as a specified address.

As the call was ongoing, the call handler set about making some notes and performed searches using the police national computer (PNC), the police Fed search database, and the local police database of information on Athena information and case management system. At the same time, the call handler would put notes on to the WebStorm case created at the start of the call, to keep the radio control team aware and help them to make decisions on whether to dispatch officers.

“Where the informing parties give names of perpetrators this information is vital, it can be used to perform an Athena search which will throw up ongoing incidents, and on PNC it will look for all mentions of the name and give an outline of related offences and or cautions, and by looking on Fed search, we can also call up any information on multiple local databases with other police forces. Especially as we don’t have joined up systems with all police forces Fed search is helpful. We can add any information we find to the current call in STORM record. And for local information, Athena searches databases for all police forces who use the system, giving us a head start on finding out who the person is before we plan a response.” - Call handler – Bedfordshire police

After quite some time in conversation, the caller then revealed that the incident was not ongoing and asserted a history of sexual abuse. As soon as this was established the call handler updated the WebStorm record to show that there was no current emergency and there would likely be no immediate evidence to preserve or immediate investigation to conduct, such as gathering evidence of the assault on the child at a hospital.

52 The police national computer is a centrally held database managed by the UK home office. It holds records of any person who has been cautioned, reprimanded, warned, convicted, or arrested for any recordable offence. Most records are stored until a person attains the age of 100.

53 FED Search is a federated database that provides a searchable interface to police forces. It is used in control rooms to query several police databases of information which hold records of crimes, convictions, arrests, and investigations related to or relevant to a person who is of interest to the police during an enquiry or investigations into a crime.
The call handler did not inform the caller of this; rather, the caller was kept talking and offered reassurance as the call handler probed further to gather as much detail.

“When people call to make a disclosure that may indicate historic sexual abuse of a child, even if we have some doubts, we don’t have the room to dismiss without following the right steps. We need to investigate; the right teams with the right skills need to go out there and find out what is really going on and to rule out any further harm. We need to record the information; we need to search for any database information that helps us to understand what might be happening or could happen. If this child has siblings, they could also be victims; we have to keep thinking, this person could be a victim, someone could be at risk, we have to find out, we can’t just dismiss it.” – Call handler—Bedfordshire

The call handler decided to pass the call on to the crime investigation bureau team for follow up. Oscar I subsequently reviewed the case and in conversation, explained that receiving this information on a Friday evening when the Protection of vulnerable persons (PVP) team and child and vulnerable adult abuse (CAVAA) specialist team were closed except for emergency call staff, the best option was to redirect the call away from the crime investigation bureau and redirect it to the vulnerable adult and children’s teams (VAC) who will be best placed to feed the case to the right work stream.

Oscar I explained that in cases where there are elements indicative of historical sexual abuse of a child, one of the most important things is to make sure that the vulnerability of the person reporting and the victim is determined and that as much information as possible is gathered and recorded and assessed to make decisions about whether there were any threats to safety, risks of continuing harm and any evidence needing immediate collection. Beyond this, the next best thing to do is to ensure all the information collected and associated links with any previous crimes and or database records is recorded.
7.3.4 Stream III: radio dispatch of police response officers

The third stream of work is related to the dispatch of police officers on response duty. This stream of work requires radio communications between the force control room and the responding police officers on duty. This work is carried out by a radio dispatch team, usually working in teams of between two and six dispatchers. On average, there are usually two on duty; however, for incidents where there are critical and serious events unfolding, it sometimes becomes necessary to dedicate a single radio dispatcher to an incident. In such cases, the radio dispatcher will then only take and make radio broadcasts related to the incident and, at times, may have to do so on a specific and dedicated radio channel.

“One we put the jobs on, the radio ops can send officers while we can stay on and keep talking to them. If there’s updates to the risk or any extra info, we can update the log. So, the radio control can get someone there while we are still on the phone” – Call handler – Bedfordshire police

7.3.5 Stream IV: response to virtual enquiries via chat, email, and web

The fourth stream of work was the coordination of responses and discussions from digital platforms. The chat and messages team manage the online enquiries chat system on the Bedfordshire police website, emails received into the police contact box, and crimes reported online.

Crimes reported online on the police force website by citizens generate reports that need to be reviewed and assessed to establish if the information is to be logged as intelligence only or to be recorded on Storm to generate a crime reference number (in cases where there is no evident means or indication that any investigation can or will take place). The information may also require a crime to be recorded and necessitate follow-up by a police officer. Such cases will be sent to the non-emergency follow-up workstream.
The police force also has a secure chat service on their website, which enables citizens to use online chat to report a crime or make enquiries. The staff in the chats and enquiries team will respond to and redirect such enquiries where relevant. They will also provide responses to the enquiries that are made. At times, the chat service could be an individual reporting an emergency who cannot reach a phone, common in domestic violence cases. As a result, in some instances, the chat handler would discuss the best approach to responding with Oscar II or Oscar I to limit the risk of harm to the reporting party. Emails sent to the police force through the police website are also routed to this team, and they perform the role of responding to the enquiries and or routing the enquiries to the relevant department.

7.3.6 Stream V: Coordinating response to non-urgent incidents

The fifth stream of work is following up and coordinating a response to non-emergency calls that require police attendance. The Crime investigation bureau team manage logged calls for assistance where the dispatch of an officer immediately is not indicated. This team will act as a communication point, and place calls to citizens whose initial calls to the police revealed there was no risk of harm or threat to their safety at the time of their calls. It includes incidents where the suspect has left or is not present, incidents that occurred while the victim was absent and incidents where there are no immediate witnesses.

7.3.7 Stream VI Critical incident response co-ordination

The sixth stream of work is critical /major incident response. This workstream is supported by the control room inspector, Oscar I, and it may also involve the radio team who relay other messages. When an incident is considered major such as one involving the use of weapons, high risk of danger to life, an ongoing incident involving critical injury or deaths and incidents requiring the attendance of armed police response officers, the control room Inspector (Oscar I) takes up a temporary role of a bronze officer.
In this role, the Inspector takes a leading role in coordinating a specific group of armed and or unarmed officers at the scene of an incident. The specific group will be directed to a separate and secure radio channel on airwave radio where they will be able to communicate with Oscar I. One of the radio controllers will exclusively man a dedicated radio transmission channel to relay instructions if need be. All officers attending the job will only communicate with Oscar I to send updates and receive instructions on the specific actions to take, including when and whether to discharge a firearm. Every communication and or call received in the control room will be routed to the bronze officer, and decisions about the risks and risk evaluations will be directed and approved by Oscar I.

During one such observed incident, involving two men brandishing large cutlasses in a public during a street fracas. The risk evaluation communication and information flow is illustrated in figure 9. The information and communication flow involved the duty inspector assigning a dedicated radio channel. The radio controller was instrumental in coordination of communications about the incident enabling isolation of the incident from other ongoing emergency response activities on the police radios. The control room inspector took charge of coordinating the armed response team and two unarmed response teams on the dedicated radio channels, giving directions to each officer present.

This process was controlled with Oscar I in a bronze officer role giving directions and approving various steps to facilitate removal of the high-risk threats; within this each attending officer was charged with providing immediate responses to each direction and updates. The inspector remained tuned to the channel giving directions to the officers to take various steps to remove the high-risk threats. In addition, the inspector directed two armed officers to support the de-escalation with preparedness to deploy non-lethal or lethal arms if need be.
When the individuals with cutlasses were finally apprehended, the inspector gave further details standing down the armed response team and deescalated the critical incident level to a standard level.

The six work streams and inspectors in the control room were also able to draw on the expertise and experience of a mental health nurse who was observed in the control room. The nurse has access to NHS systems which hold medical records of persons known to the mental health service. When calls routed to 999 or received on 101 that require an emergency response related to a person known to have challenges due to mental ill health, then the nurse would be called upon to look up the person’s details.
The mental health nurse was observed providing information to enable clarity around the risks involved for the individual and the potential risks to any officer attending. In some instances, the mental health nurse was able to provide information about ‘triggers,’ actions, words, or reactions that might escalate the emergency. The basic information was then appended to the WebStorm entry and transmitted to constables by the radio team.

“Having that one person here, it helps us to know what to do with people who are already facing a lot of difficulties due to their mental health. We could route them to the mental health team or crisis team, but in an emergency, what the person needs is an ambulance. If ambulance won’t go, we have to, because it all falls under the prevention of harm and preservation of life” – Control room Inspector – Bedfordshire

While observing 999 calls, a call came in from a distressed citizen who indicated they were experiencing a mental health crisis and needed help. The 999 staff spoke to the citizen for some time to ensure no crime was occurring. They placed a call to the ambulance service, who indicated they could not attend as they had no ambulance staff and vehicles available.

They placed a second call to the mental health crises team, who answered and indicated that they could not place a call to the citizen to speak to them or respond in person by calling on the citizen. They asserted their office phones had no dial-out facility, not even for patients and that their team was not equipped to make house calls. Eventually, officers had to be dispatched to go to the citizen and take them to the hospital. This involved an abstraction because the officers were duty bound to remain with the individual until they were seen, evaluated, and discharged or admitted to the care of the hospital. In most observed cases, officers would also have to transport the citizen back to their homes if discharged (which was the most common outcome) after hours of sitting with them in the waiting room.

There was another element that call handlers had to manage. Sometimes an incident would occur in public, and many calls would be received from members of the public about the
same incident, each sometimes giving different accounts. Furthermore, when the control room would dispatch officers, the officers would need more communication than usual because such incidents would involve various types of spectators. The spectators would heighten commotion, distracting or obstructing police. At other times spectators would set about gathering details of an incident which might not be reflective of the entire incident, or which might release details that police would ordinarily hold back as approved practice.

One such incident involved a person who had died by hanging themselves from the peak of a building in a residential courtyard. Police expressed they were powerless to stop citizens from filming and expressed dismay that the family of the victim would find out in a cruel way. Additionally, because of the growing crowd of spectators, the police were unable to follow the specified protocol when a person who is dead is discovered. Instead, they had to hastily remove the deceased engaging assistance from the fire service.

“We are meant to contact a medical and forensics team. But people are standing on some of the evidence and filming other parts. They don’t care if the person’s family don’t know or if there’s a suspect; we can use the evidence to catch they’re going to have it up on social media instantly, best thing is to cut the body down and leave them with nothing to see” – Sergeant – Hertfordshire

7.3.7.1 Vignette – managing a high-risk vulnerable adult incident

In a second incident, an individual suffered a psychological break. The person had stripped naked and opened a wide window while shouting incoherently. There were also fears the person was armed. The location was near a school, and the incident was ongoing during the school pick-up time. Most spectators were parents with children, and many called in distress. The police officers attending were unwilling to act without a negotiator in place.

As the situation progressed, it became evident that the individual was not known to any mental health service nor was the person fluent in English and their identity was unclear.
Officers at the scene considered they could not force entry as they considered the man might jump from the window and harm himself. The armed response team who were in attendance given one of the reports from public made mention of weapons could not force entry to prevent aggravating the situation.

A bronze sergeant was allocated to attend in person and the chief inspector for the locality was contacted as the lead officer for the area. of what could be understood, However, given the circumstances one of the attending officers eventually tried a door and it opened letting them into the building, the officer got to the person, and removed them from public view.

The siege involving two negotiators, three-armed response officers, two teams of police response officers, one duty sergeant and the chief inspector for the region including a dedicated radio operator and the control room inspector, finally deescalated.

“It could have gone wrong, but in that moment, where we are trying to go with the right approved practice, we also have to do what is in the public interest, what is dignified for the victim, and waiting to negotiate with someone who isn’t saying anything we can have a conversation about, we can’t go in and attack, we have to think quick” – Inspector – Bedfordshire

7.4 Responding and intervening in routine incidents and emergencies

The work of response/intervention officers (largely constables) involves several different communication and administrative activities

7.4.1 Communication via response officer briefings

The first is communication through briefings alongside interaction with fellow constables, mostly in person and supervising sergeants in person and by radio. Briefings are held in designated rooms, and officers are given details of any planned activities and aggregated information about wanted persons, persons of interest and locations of interest. The
information is delivered to them by Sergeants accompanied by the duty inspector for their shift using prepared information slides. The briefings observed were a means of socialisation before the work of the day began. Police constables with outstanding queries or this required to take on duties other than the usual response to incidents were informed. Officers are often invited to share their summary of the last shift and any intelligence or knowledge they may have gathered on their patrols.

“Especially when we’ve all been off for four days, I like to ask each officer to tell me something good and something valuable. That pep-up talk helps to discuss worries; everyone learns from it, and the officers get to learn about other incidents and there’s valuable intel shared” – Sergeant– Hertfordshire

At Hertfordshire, inspectors and sergeants were observed using the briefing sessions to encourage brainstorming on known local issues, motivating constables in attendance to share intelligence from their last shift, their concerns, worries and positives about their last shift before moving on to the matters of the day. This prompted animated roundtable discussions and enabled an agile briefing session. At Bedfordshire on the other hand, briefings were routinely held in large theatre spaces involving fewer interactive contributions from the constables.

7.4.2 Transmitting communications via Airwave radio

The second is communication with the force control room through airwave radio and through receipt of email messages by phone. This communication is often geared toward the delivery of information required to get officers to and from an incident requiring police attendance.

“We are sending them out there with a radio, we need to accept that reality, the radio is not a weapon. They are often not going to get a nice welcome, but the whole thing is that .... It
relies on them you know making sure they spot risks to themselves, risks to others, recognise
a victim and do the right thing, make the right decisions to prevent more harm and to come
away safe, we want them to go home safe too” – Sergeant Bedfordshire

The airwave radio system is a two-way communication system that allows radio control
operators in the force control room to reach all officers. It permits one communicator at a
time to speak to the control room. Observations of its use revealed that officers would often
restrict themselves to short responses, updates, and requests. Sometimes officers must wait
to deliver updates or requests when it is busy, and others will often log in to their laptops if
double crewed to get clarity on the incidents they have been dispatched to.

7.4.3 Recording communications using notebooks, body worn cameras and laptops

The third is communication with members of the public in the course of their duty. For this
duty, officers are often engaged in making enquiries and communicating various requests to
citizens. The use of police notebooks was prevalent, as was the use of body-worn cameras.
Police constables also used their laptop to access details of incidents they are dispatched to
on the police network by tethering the laptops to their police-issued mobile phones.

7.4.4 Recording information using information systems

The fourth area of work is related to raising reports, logging, and filing interventions,
intelligence, and interactions on the information systems. This often applied in incidents
where there was no further action required or where the communication with the public or
patrols resulted in the elicitation of relevant intelligence. The work involved some use of
police notebooks and predominantly involved the use of work-issued phones and laptops or

54 Airwave radio is a land mobile radio secure communication radio network that operates on a land mobile radio network currently
supplied to police forces by Motorola.
55 Double crewed is a term used to describe a police response team of two officers who are paired during their shift to respond to events
using one vehicle.
computers in the report room to log intelligence or complete reports related to routine stops and or incidents where the police officer has responsibility.

Police officers were also observed using their computers and laptops to record statements in situ, upload information, file evidence and initiate cases on the Athena software. Sometimes they might record statements at the incident location with the witness present, and at other times, they would record statements on their body camera or in their pocket notebooks for transfer to the information systems later.

7.4.5 Police response and intervention summary

These means of communication and information recording were considered important by all officers, with the airwave radio being considered the most critical tool to fulfil their duties. Most sergeants shared the belief that the airwave radio was central to an adequate response to incidents.

“The radio links us to the control room, and it also allows them to locate us in an emergency. The phones don’t always work, but the radio, it gives us a way to listen in and know what’s going on in the county” – Police constable— Bedfordshire

“When officers need backup, or an incident is unfolding that needs attendance, listening on the radio, you already know where the incident is at if you get to an incident and you need advice, the radio is right there to call the sergeant from” – Police constable— Bedfordshire

“The idea for the team, they should be on the road, that is where policing is, and this radio, it’s their lifeline, their link to information, and a way to get assistance if they need it, it’s a part of policing” – Sergeant— Hertfordshire

On the planned transition from the airwave radio system to the new emergency services network, officers indicated they had expected to transition to the system since 2017, and
many believed they still lacked clarity on how it would work, given the problems they already experienced using mobile phones on similar networks.

“A lot is riding on this technology no one has used before, well you said Korea, but this is not Korea, that’s way smaller than us, it might have been better to find a way to work all that out before arranging the move. That said, a move has been arranged, that’s all it is now, it’s being arranged and all we can do is hope it works out well and realises the savings we need” – Superintendent— Bedfordshire

Many officers cited concerns about how the network would hold up, given they often respond to incidents in isolated, rural settings with limited connectivity; others were sceptical about how mobile network operators could fulfil connectivity demands required by police services. Officers were ambivalent and, in some cases, resolute.

The feelings expressed highlighted the delays, limited information, and scant updates about the systems, with most learning about progress from brief police bulletins and press information from the government.

“So, we are going to have a device which will be our phone, our radio and also have Tuserv for us to file mini reports. Well, first of all, no one uses Tuserv unless they have to because whatever you do on there, you often end up having to do it again. The other thing is the radio we have now, it uses a comms loop, and you can listen in. I guess the phones will be Bluetooth then, well, not wired; no one has phones wired, but how will we run or make haste to an incident, then fiddle with a phone to log in, then call the control hands free and what if someone is trying to call you on the phone while you are on the radio. Honestly, I don’t think

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56 Tuserv is a police mobile application available on smart phone devices. It provides police officers with online and offline access to a paper free electronic pocket notebook. It has capabilities to access multiple systems to conduct searches and police systems for submission of routine reports such as stop and search. It also enables access to a collaborative event dashboard where officers can build cases on the go, create and access statements and log evidence such as footage and captured images, video, and audio.
any company can promise they will work in black spots where there is never any reception” – Sergeant Bedfordshire.

Others indicated that they were unsure that the proposed emergency services mobile communications program (ESMCP) would culminate in a change of systems and network given that they had been primed to receive the new system for almost eight years and were yet to see it implemented.

“We waited a long time for Athena, but the ESN program was supposed to be arriving at the same time. Each time we think we will come in and move over, we end up hearing it’s been delayed. I think after all these years and the spending, it might have just been better to negotiate better terms for airwave radio. That all said, it’s out of the control of police forces. We will end up moving if that is what is mandated, and then the police forces will have to find a way to pay for what they need once it arrives” – Superintendent – Bedfordshire

While responding to incidents, all officers encountered indicated body-worn cameras were especially useful for collecting information, evidence, and statements. They also indicated they found the use of cameras empowering, giving them a sense of confidence and evidence of their actions.

“The body-worn cameras are a way of backup, to be honest, it helps with taking statements and sometimes, you are out there at an incident, and someone says or does something. You could get them back to custody, and they recant like they say something else or claim something else happened. It happens a lot, especially when you arrest someone. Other times, it’s a domestic situation, and you need that initial evidence of what the victim and the accused person have to say. It helps a lot with making decisions on risk levels. Like a way

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ESMCP is government Program that is led by the UK home office. The program has worked on the development and implementation of a new emergency service network, software, and handheld devices. This is intended to replace the current Airwave radio system used across police forces in England, Wales, and Scotland.
of looking back, just to check, did I spot all the risks, did I make the right decisions, is there anything else I should do” – Police constable – Hertfordshire

Their use of police-issued laptops and phones varied, with most using the laptop over the phones. A number of concerns were raised around ease of use, reliability and accessibility of the phones when responding to emergencies. Many reported patchy signals and complicated login protocols, while others were concerned at how dated the technologies on the phones are.

“Considering the cost and cuts, the tech we have is adequate, a lot of the time it’s their unreliability and downtime.... my phone...it doesn’t connect to WebStorm and give me WIFI. Laptops only tether to phones, so it means can’t check phones or laptops for WebStorm or record jobs.” – Police constable – Bedfordshire

“There are people out there with better phones than we have online or in the streets, with high-end technologies and better reception. I have reception on my personal phone almost everywhere, yet when I get into work, I turn on my work phone, and the reception goes on and off at random.” – Police constable – Hertfordshire

Logging in to the phones is a fiddly process, and sometimes, I end up having to come into the report room to log in and look at an email. For the laptop, you need to make sure you have a full charge at home before coming in and linking it up to the phone can sometimes fail because of no network or the battery on the phone dies on you when you least expect.” – Police constable – Bedfordshire

“How do you pursue a criminal whose business is the use of high-end tech? Well, we have some tools to do that in investigation departments, but you apprehend a criminal on the street, their phone, it has all these features, right there and then, you need to be sure of your grounds, they’re driving off and wiping their phone and chewing up sim cards, then we show
up and whip out our low-tech phones to check details, and of course, then you have to login...” – Police constable—Bedfordshire

Concerns were raised about the use of laptops, with most preferring and expressing the usefulness of a report room and access to computers with bigger screens and better connectivity when completing administrative tasks.

On enquiry, some of the concerns about the use of the laptops related to Athena case management and information system software, such as the layout, interface, and reliability.

“One minute you are sitting there and maybe you are case building and adding stuff; then it just goes off, no warning, just a black screen...and when it comes back on, everything is gone, you have to start all over again” — Police constable – Hertfordshire

Overall, in observation, Person to person communication physically was predominantly observed between constables and their colleagues and Sergeants. The role of the sergeants was demonstrably important to the continued development of the police officers.

Additionally, Sergeants asserted their role was to support and enable constables to consider the inherent risks related to each incident from a different perspective. They saw their supervisory role as a means of debriefing, re-evaluating, and reviewing risk and identification or reconsideration of the applicable legislation, PACE regulations and authorised professional practice. Overall, they indicated person-to-person communication via airwave radio was central to the response to emergencies.

“There are times when they can’t call the control room, you know, the staff in there are not police officers, we are here for them to ask questions, ...we encourage them to, not all the time, we need them to be independent, but it’s important to have a second opinion sometimes, fresh eyes to reassure them they made the right decision and spotted all the risks.” – Sergeant—Bedfordshire
“We have a lot of officers new in service. They come from training and get paired with a buddy for less time than before; it’s good to be there for guidance and support” – Sergeant – Hertfordshire

When observing the communication between the force control room and the police, officers were seen to rely on the control room to relay incident detail and directions required for them to respond to incidents. They also generally constrain themselves to brief structured responses when acknowledging directions or requesting further detail. Officers tended to abstain from repeated requests.

They habitually made efforts to ensure they could receive and understand the information being relayed to them quickly and expeditiously. As I did have the opportunity to listen to the radio myself to understand the experience, it was often not completely easy to hear everything being said. Officers were demonstrating the impact of experience and cognitive capacity, given they would receive instructions while driving, sometimes at high speed.

In instances where they were unsure, most would attempt to access further detail by accessing their laptop to access WebStorm⁴. At times, officers would be directed to call through to the control room if the information to be relayed was indicatively complex, and at other times, they could be directed to switch to a dedicated radio channel.

The use of dedicated radio channels was observed when incidents police constables were called to involved a person of public interest, a previous or current member of staff, or if the incident was considered a major incident requiring a bronze command approach.

“The idea behind switching to another dedicated channel is to maintain security and privacy; sometimes, it is important that the information about a job, say if it’s a member of staff … or a senior member of parliament, not broadcasting their name or details over the airwaves for everyone on the radio to hear” – Constable – Hertfordshire
“Some high-profile individuals have to move home if someone that shouldn’t get wind of where they live, so when there’s anyone who is of public interest, the control will call us, then direct us to switch to a channel, and give us details, other times, they could ask us to call on the phone to get details. Sometimes you have specific instructions, so it is really important to get it right” – Constable – Bedfordshire

“We are able to restrict access to jobs because of the sensitivity and risk associated with potential leaks of information about crime for example honour based crimes, domestic violence, or any highly sensitive matter, it can be restricted to only control room staff or only specific staff to prevent breaches of the protective measures being put into place” – Control room inspector (Oscar I) – Bedfordshire

Some officers highlighted an issue related to the communication between the control room and response officers. At times, the control room would relay information about an incident and direct the officer to attend. In some instances, the information given by the person seeking assistance might be relayed incorrectly or inaccurately due to errors during the recording of the information.

In the instances where this was observed, the underlying reason was unclear; however, following immersion in the control room, it became apparent that there were often cases where a caller was intelligible and, in those cases, if details of an impending risk were elicited, the control room would send officers ahead in the hope they would establish the risk on arrival.

During observations, I learned how things could easily go wrong in three separate but linked incidents weeks apart. On reflection, I realised that not only was it important to have adequate intelligence put on to jobs police were sent to, but that it might be difficult to marry up seemingly unrelated incidents.
7.4.6 Vignette: One man, two lofts and quite a few crossed wires

In the first incident, police had been asked to call at an address where neighbours thought there was suspicious activity. There was no reply at the door; however, the rear of the property was accessible, and the back door was unlocked. The police checked and found the house vacant. The officers surmised that the occupant may have lost their keys and left the back door open. Efforts to reach the occupants were abortive, and police departed.

The second incident was weeks after. This time the police had been sent to an address. The information from the control room was that they were responding to a call about a disturbance from an address where a woman known to police lived. She had become known to the police because of her turbulent relationship with the father of her child, who had a chequered police record.

The woman lived in a house with her father; her child was now residing with her mother. She had been advised previously to comply with an order prohibiting her from making or enabling contact with the father of her child, who was subsequently imprisoned. On the way there, police officers determined he had recently been released from prison.

Upon arrival, the first thing the police did was to speak to the female reassuringly and ask her if all was well. The woman appeared nervous as she explained she had an argument on the phone with a friend, and that might be what the neighbours heard. She was unwilling to provide details about it, the officers asked to look around, and they searched the bedrooms, bathrooms and living area.
As I waited in the hallway, I felt sure I could hear noise coming from above or below me but could not place it. The officers decided to search the rooms again, and on finding nothing, they decided to leave. As we left, I indicated, I could hear something, and between myself and the officers, we waved it off as nothing, putting the noise down to the structure of the block of flats.

On exit, the woman’s father arrived and intercepted the police. He indicated he had responded to a call about an emergency. The officers also reassured the man. Eventually, the officers reported all clear to the control room, and the emergency call was downgraded.

In the third incident, the control room sent the officers to attend to a distressed parent who reported a person was drunk and sexually exploiting their child. On arrival, I recognised the location and the man from the previous attendance, he was very inebriated.

He indicated that he had met the police just two weeks prior, and they told him all was well, but when they left, the criminal who abducted his daughter emerged from his loft, and he felt powerless. He also indicated he had tried to go to the premises where his daughter was supposedly kept against her will, but he could not gain access.

He explained to the police that his daughter’s boyfriend had just come out of prison and had now lured his daughter to a trap house. He informed police that a friend of his, had seen his daughter going into a known trap house occupied by sex workers and drug users. He gave a description of the location and provided details of the alleged abductor, but he did not have specific address. We departed the man’s house and went to find the described location.

On the way, the officers were able to check and confirm that the man described as the abductor was the subject of an outstanding warrant for assaulting a person in another incident in the previous week. They were also able to establish that the man was known to police for violent behaviour and posed a risk to officers.
The father had described the building as having unique hoarding on the windows, so we looked for this in the dark. As we drove past a particular house, I remembered I had been there before. This was the house where the back door was open, and no one was in. It had the window hoarding the man described.

When we arrived, the officers decided to call for support from another team. Soon after, the armed response team arrived. The armed officers made the advance and tried to access the front door. When it was clear it was bolted shut, I told the officer I had been there before and what happened then.

One of the officers remained out the front of the house while the rest of us went down the side, and as before, the back door was unlocked. When we entered, we saw an older female and a younger one whom I recognised from the previous incident at her father’s house. The officers announced themselves, and then spoke with the younger female. She denied being abducted and stated she was not the named abductee. She also denied all knowledge of the man who was wanted. She insisted she was visiting her friend and wanted the police to leave.

As the officers made to leave, I took one of them aside and told them that the young woman was not truthful, and I explained how I knew this. The officers went back and asked the woman to confirm her name and identity. She was not cooperative. Following this, the police informed the woman they would like to look around and made to check the loft of the house.

They went into the loft to the house and found a man hiding there and arrested him. They spoke to the female, who insisted she was unrelated to the parent who called. The police established that she was of sufficient age such that they could not force her to leave the premises. They decided they would inform her father that she had been found safe.
The officers took the arrested person back to the force custody suite and completed case updates to alert the officer investigating the assault case that the suspect was now in custody, waiting to be interviewed.

Later, as we reflected, the officers and I discussed how hard it would have been for the control room staff to link all three incidents. I was aware of all three incidents purely by coincidence and perhaps through the advantage of persistent field immersion and happening to be present on each occasion police responded to these incidents. Following the incident, the activity diagram created as events unfolded provided a means of validating and enquiring further about various elements such as communication, use of and access to information and the use of information systems. Each officer present was able to see the activity diagram and provide insights into various steps within the illustration including the rationale for each risk decision taken. It was plausible to agree that the difficulties with the third informant contributed but part of this was also attributed to limited experience of call handlers, knowledge management limitations and complicated information systems preventing the identification of the links between at least two of the incidents.

7.5 Detaining citizens – information, communication, risk, and safeguarding

The police forces at Bedfordshire and Hertfordshire have four custody suites between them. The practices at these four, located at Hatfield and Stevenage in Hertfordshire; and at Kempston and Luton in Bedfordshire, were similar. The custody suites at Stevenage and Hatfield were larger than that at Luton. The custody suite at Kempston was the smallest of the four.

In each custody suite, there would be at least two custody sergeants on duty assisted by at least three custody officers. All the custody suites were equipped with audio and video links, and the desks were enclosed with counters and raised toughened clear plastic barriers except at Kempston, where there was no barrier between the desk and visitors.
The custody sergeants are responsible for booking in any detainees using the Athena custody booking in system. During observations, they would open the software, and officers would provide information about the arrested person and circumstances. The sergeant would then ask for and record arrest grounds, details, and justification for the use of force, if any.

Next, the sergeant would inform the detainee that they were going to be placed in police custody, give them the reasons, and advise them not to provide any details of the crime to them at that time. This step was observed as important in the process of booking in because most detainees would start to state their side of events. Some might make a range of accusations against police officers and against other citizens or even against the sergeants they had just met. On the one hand, the integrated camera and recording systems within the control room provided an advantage, as all utterances by staff and detainees would be recorded, critically, if detainees made threats or disclosures of further crimes, these could not later be denied. On the other hand, enabling discussions provided an opportunity to build rapport with detainees enabling disclosure of information relevant for their safeguarding while in custody albeit this would sometimes create bottlenecks in the booking in queues.

“On this, it is good Athena is set up to make sure we ask all the right questions and get all the information, so we comply with the policies and legislation regarding custody. The only thing is it is a long process, and people get impatient. Over time you find a way to make it as natural as possible, to maintain a conversation and get to know the person in front of you because for the next couple of hours, maybe 24 maybe more, you are all they’ve got, and you need to keep them safe” – Custody Sergeant – Bedfordshire

At times, the booking in the process would have to stop until the detained person was open to conversation and answering the sergeants’ questions, and at other times, if there was an impasse, they would abandon booking in and place the person in a custody room till later. I enquired about the process and discovered that the information system had been set up to
ask questions following a sequence that ensured all statutory questions about the welfare of a detainee were asked, aiding compliance albeit limiting a natural discussion.

“Sometimes they get used to these questions. We have the customers who come in and say no to everything, and we could book them in and be done, but we need to have conversations, try to get them to talk to us. Custody can make people feel helpless, trapped, or even make them feel there is no hope; we need to be sure of how they really are” – Custody sergeant – Bedfordshire

The sergeants indicated that discussions with detainees at the booking in desk was an important aspect of their work. They explained their role is to build a rapport, make the detainee feel at ease and motivate them to disclose any information that could be relevant for the purpose of ensuring they did not come into harm while in the custody of the police and when they leave.

“The hostile customer could be the most vulnerable, and it’s not just about when they are in here, all this information we try to gather, when they leave, it’s still on us, whatever happens to them, so if we can tell if something is going to happen, if they will do something when they leave here, then we have achieved our goal” Custody Sergeant— Bedfordshire

This information collected by sergeants is stored with the detainee’s custody record and linked to the specific incident case records on the Athena case and custody management information system. Following this, the detainee is issued with information about the rooms they will be held in, including how to access help, use the bathroom, get refreshments or reading material.

“It’s a hard place to be custody, so we need our staff to present a front that is professional, to make the people coming in expect a professional service; it’s not exactly a palace, and
their quarters are not comfortable, but at least if they are treated well coming in and leaving, then things are likely to be better for everyone – Custody Inspector – Hertfordshire

Before an individual is placed into the custody rooms, the custody sergeant would often ask the police officers to search the individual, and a metal detection scan will also be carried out using a scanning chair that detects metal in body cavities. The citizen’s belongings often including shoelaces and clothing with laces and jewellery would then be bagged and stored in a safe keep room in the custody suite to be handed back on their departure from the custody suite.

Following this, detainees are also provided with a change of clothing and shoes that meet the safety standards in the custody suite. Detainees were required to hand over items that could cause harm or be used to effect harm for safekeeping. Depending on the type of incident giving rise to the arrest, shoeprints could also be collected. In some instances, individuals would also be required to provide DNA sample, fingerprints, and biometrics. In yet others, the detainee could be subjected to breath, blood, and saliva tests to determine levels of intoxication from alcohol and other drugs.

The detainee is then assigned a room in the custody suite once the administration is complete. The staff would record the key information for the detainee on a digital whiteboard and conduct checks via video link and door knocking. Custody staff were also responsible for ensuring that social needs such as food, refreshments, books, and other similar offerings within the custody suite were provided to the detainees.

I made enquiries regarding the rationale for gathering detailed information from detainees and spending time listening to various explanations. I was particularly interested in the scope of information that could be cross-checked and linked to an inbound detainee and the significant number of questions focussed on welfare and health prior to detention and post detention.
“Well, the computer cannot see us or them, even the high-end technological video tools cannot see them that well, so it is up to us to strike up a rapport, to discuss and to make light of their presence here, even if they have committed a heinous crime, we are only here to process and organise interviewing, and recommend or well...nowadays ask the CPS, that is the detectives will tell you...especially for specialist cases that reaching the CPS is not as simple as bundling files, but yes ... the rest is down to the CPS” - Sergeant — Bedfordshire

Custody sergeants also clarified that there were policies around safeguarding detainees and maintaining accountability as a professional agency with last contact. They indicated that it was crucial to ensure information about any potential maladaptive response to being placed in police custody temporarily or detained long term was recorded and actioned. Additionally, the custody sergeants explained that they are tasked with making referrals and offering signposting to relevant community services with scope to rearrest a person who presented with serious risk indicators for a mental health evaluation before being released from police custody. The information being collected was indicatively relevant to achieving their duty of care and it served a second purpose by providing intelligence which could be linked to the individuals local police record.

But either way here is the thing, we have to do this because it clears our end, we have asked and cajoled the person for information and tried our best all the while they are here to strike up a conversation and we hope if they feel low, they will disclose it. – Inspector — Bedfordshire

But we cannot do much with that information, we cannot make anyone do anything, however we can refer them or if it is really bad, we can rearrest them and section them using police powers and take them to a facility to be seen, even then we cannot do anything and in almost all cases where and when we do that, what happens is that we invest resources and the response sarg loses 2 maybe 3 officers for some 5, 7 sometimes 12 hours camped in a
hospital guarding the person they sectioned. At the end they talk to the person for half an hour if that and tell us they are fit for release. – Inspector— Hertfordshire

The entire process could take as little as 20 minutes and sometimes be as long as 2 hours, depending on the presentation and demeanour of the detainee and, in some instances, on the specific needs and their responses to questions.

The custody inspector also performs duties to support the detainees. The bulk of detainees brought to police custody can only be remanded for 24 hours. Any detentions exceeding this timescale would require a PACE decision from a superintendent.

To ensure compliance, custody inspectors were observed checking on detainees, accessing the custody whiteboard to check the progress of detainees, contacting officers responsible to encourage them to conduct interviews in a timely fashion and following up with attending solicitors who might delay the process and lose time. In cases involving children, or persons with learning difficulties, this would include ensuring expeditious facilitation of an appropriate adult.

The work of custody staff also involved maintaining a near passive reaction to information that they received and gathering intelligence where necessary. One such instance during observation related to a series of organised protests by eco protesters. The work of disrupting the protesters was complicated by the level of the organisation put into the protests. Police officers experienced difficulties removing them as they would glue their hands to the motorway surface.

An interesting observation which was passed to investigators related to the presentation of the protesters. They all arrived at custody with details of a designated solicitor to contact. Each had little by way of personal possessions and identification documents. All had significant sums of cash ranging from £150-250 in their pockets or wallets. They appeared
relatively compliant, however they also showed high levels of passivity given the gravity of their actions.

In discussions with the police officers who made arrests, it was determined that they had been able to gather some information about the organisers of the protests. Some protesters had shared that they were provided hotel accommodation, transport to the location of the protests and payment for maintaining action that would cause as much disruption as possible.

They were also promised legal defence and compensation if arrested. The result of the motorway barricades and the arrests was the capacity to gather intelligence about the organisation of the protests, but mostly the strain was on resources. Due to the pandemic, the arrangements in the custody suites were different, and some custody rooms could not be used for people who were not vulnerable.

The disruption to citizens and the resources the police invested in removing the protesters including managing calls from concerned citizens was significant. Halfway through the day, the custody suites were full, and on the following night, following an evening of protests, the custody suites were full again, necessitating cross-border requests to use other custody suites. Despite the demeanour of the detainees the sergeants did not react.

7.5.1 Vignette: managing a highly intoxicated detainee

In another incident at Christmas, a citizen was brought to police custody having been seen driving erratically. Officers suspected the individual had indulged in several toddies and gone to work. The citizen was however insistent that they had not been drinking excessively. A calibrated breath test was required and administered, and the results showed that the detainee was significantly over the permitted alcohol intoxication limit for drivers. The recorded values were so high that the duty Sergeant was fearful the citizen might be on the brink of alcohol poisoning. Following consultation with the police medical officer, the citizen was transferred to hospital for evaluation and subsequently released back to police
custody. Throughout this citizen seemed to be quite stable on and coherent in conversation, making small talk showing little signs or awareness of being highly intoxicated.

The duty sergeant remained quite calm during booking in which was remarkable given the citizen was intent on having a range of conversations unrelated to the reason for detention. Then the citizen revealed they had begun drinking before work and during the subsequent biometrics capture, it was then discovered that the red stains though to be blood were actually stains from drinking through the required disposable mask while at work. This suggested the citizen had been intoxicated while at work, caring for elderly and helpless people.

Once the citizen was settled into a custody room, the sergeant intimated that the demeanour shown was not uncommon when I enquired. As he spoke, it was clear he was saddened about how intoxicated the citizen was and how unaware of it they were. This we surmised was likely due to habitual and long-term consumption over time.

“She could have killed herself, killed someone, even given an elder the wrong medicine. The sad thing is this is not just about driving drunk, she is indifferent. She is so far gone, her presentation, the level of alcohol, that in a way, she is lucky officers found her today. This may be her wake up call, and the beginning of the end of this for her.” – Sergeant—Bedfordshire

The observed practices in the custody suites at all sites involved persistent communication and interaction with citizens. Their communications with officers were centred on effective information gathering and establishing risk factors related or connected with the circumstances of the arrest. When communicating with citizens, the focus was on establishing risk factors related to welfare, determining levels of vulnerability, or establishing needs (religious, dietary, social and health) while in custody.
7.6 Investigating and prosecuting crime – containing harm, mitigating risk

Both police forces have several specialist teams who take over investigation and case preparation for the purposes of prosecution as indicated in Figure 10. Within each police force, the police response and intervention officers were observed conducting various tasks associated with managing routine crime cases directly. These included traffic offences and minor infractions, where they would issue a ticket or report a driver for an offence then manage the work associated with presenting statements and liaising with the courts through digital requisitioning to secure prosecution for these.

For crimes with a specialist element, police intervention/response officers end most of their responsibility at first touch once they have structured and initiated a case. Following completion of an intervention, the officers create case records and add information relate to their intervention which will include details of allegations made, legal grounding and cause for the arrests i.e. what crime a person may have been arrested on suspicion of, their own statement of attendance/witnessing detailing the information they have gathered through their intervention, witness statements from third parties, and digital and physical evidence supporting the allegations made.

In some instances, they may also complete a risk assessment scoring questionnaire while attending and append these to their case records.

Once they complete this administrative process, the case information is sent to a specialist workstream staffed by detectives who will review the initial intervention, evaluate the risks, and assess the extent of the harms that are alleged and or supported by evidence. An overview of the specialist investigation teams is shown in the diagram below.
Figure 10: An overview of typical specialist teams at the police forces

In most cases, specialist teams will take over the interviewing of any suspects and conduct a review of witness statements, contacting any parties involved to gather more evidence. Following this, investigation detective constables will consult their team prosecutions officer who will often be an experienced detective sergeant. In many cases, specialist detectives are assigned cases at the point of arrest, and they are tasked with conducting the interview of suspects. Following this, the detective sergeant (sometimes in collaboration with the detective inspector on a team) will work through the evidence gathered and consider the severity of crime including the social, economic, and physical impact of the crime on a victim/s.

Using their knowledge and understanding of legislation, they will review interview notes, evidence, statements, and any incidental intelligence that may exist on police information systems and draw conclusions on the positioning of the criminal acts in relation to legislation.
Once they have clarity on specific crimes that can be prosecuted, they will then compile all the case files on Tuserv (a mobile version of Athena that enables easier collaborative access and contribution to case files) and contact the crown prosecution service for advice on formally charging individuals with a crime. Although this is standard practice. At times, the advice from the crown prosecution service may be sought prior to conducting interviews depending on the severity of the crime and the strength of the evidence.

This is the usual approach in cases involving interpersonal crimes and domestic incidents. When observing the work of the child and vulnerable adult team at Bedfordshire, they indicated that although they are dependent on initial response carried out by police response officers, they have increasingly begun to introduce specialist officers who have the experience, expertise and understanding of the nature of the crimes they manage, victim needs and investigation requirements.

"The response officers are a lifeline. But the individuals we work with, our victims, they have specific needs, the investigations need to be conducted in a specific way too. Although the response officers are trained to do this, our officers have the benefit of working on these cases over long periods to secure prosecutions and they are likely to approach the situation differently" – Superintendent – Child and vulnerable adults abuse – Bedfordshire

In the child abuse department at Bedfordshire, the most prominent concern was ensuring officers with specialist training were on hand to gather information from victims. Senior officers on this team highlighted some concerns about response staff not having the specialist knowledge of ‘how to, what to’ which could impact on the way information and knowledge is gathered at the initial stages. They also expressed marked concerns access to information from other parties and agencies who had statutory duties to victims, particularly when this information could inform their investigations and risk planning for the victim as well as support expeditious investigations.
“Our priority is the victim, when they are children, what we can do now, it will be part of what will shape their future. If we can’t get the information we need, if we have delays then we end up with backlogs, people recant, support is not given, we fail the victims.” – Superintendent – Specialist unit – Bedfordshire

In the domestic violence unit at both police forces, detectives would re-score risk assessment evaluations, then review evidence, then conduct initial interviews of suspects if any had been arrested as soon as practicable, using the evidence collected by the intervention officers to guide their interviewing.

For incidents characterised by high risks of harm and danger to victims, officers at both police forces explained that although the proactive arrest approach could be perceived as extreme, it was the first preference. They based this on evidence led approaches that highlight the importance of safeguarding victims. Many indicated that arrests provided a breathing space between the victim and the perpetrator and often gave them confidence to give evidence, support police action and attend court.

If no suspects had been arrested yet, they were likely to review all the evidence available, review the victim’s initial statement and that of the attending officer in order to establish how to proceed. In other instances, the specialist teams would set about conducting their investigations without arresting or interviewing any suspects, relying on witness accounts to begin with. They then set about obtaining relevant information such as camera footage, access to documents, access to information such as phone records and or asset enquiries. One of the rationales for this was the concern about PACE custody constraints. Their goal was then to make sure that when they arrest and interview a suspect, they do so armed with enough evidence to motivate admission and or disclosure that would support prosecution and ease the process of acquiring permission to charge the suspect.
At times, the police explained they receive intelligence reported by third parties, but they don’t have evidence. This type of intelligence constituted a basis for enquiries in order to decide if a crime had occurred or was occurring. At other times, the police could receive information about crime from other agencies and opt to investigate and gather evidence that shows clear criminal activity before effecting arrests and interviews.

It was evident from their views that although they consider every crime reported to them important, a good many of the alleged crimes reported are accompanied with limited evidence and or conflicting accounts from victims and witnesses. Additionally, the staff were clear that although legislation outlines what constitutes a crime, there are other caveats to satisfy. Police must demonstrate that they have enough information, data, and evidence to satisfy prosecution thresholds for crimes specified in legislation.

“So, we have to navigate thresholds for crime, what counts as a serious offence using the thresholds that the courts set, then we have to consider whether the evidence available is indicative of thresholds that are high enough to effect a prosecution. This is really important because every victim wants justice, but we cannot achieve justice without meeting those thresholds that show that it is possible to successfully prosecute the crime” – Detective sergeant – Hertfordshire

They asserted that it was difficult to manage expectations given they do not have capacity or ability to prosecute crime. In principle, the bulk of their work would end at the point where they send case bundles to the crown prosecution service leaving them with nominal involvement such as attending court to give evidence.

“All we can do is investigate...having said that, it’s not as if we know more than any of the parties will tell us, or what we are able to discover and even then, contrary to what everyone thinks, we don’t control the CPS. We could do all that work, we believe we have good evidence, and the answer comes back, with a stiff no” – Detective sergeant – Hertfordshire
“It is really hard explaining to victims that we can’t prosecute, or well, the CPS won’t prosecute. It can get to you when you come to a point where you have to put a case on ‘no crime,’ the word itself, it’s like all that work for the victim, it’s come to an end, even if you know, you can see that a crime occurred, yet, you have nothing” – Detective sergeant – Hertfordshire

Beyond this, all teams were agreed on the difficulties they experience communicating with the crown prosecution service highlighting slow file transfer and receipt, limited staff availability at the CPS and nominal out of hours services.

“We could send a file now and six hours later, we are still waiting for the CPS to receive it, sometimes we have to resend it” – Detective sergeant – Hertfordshire

“There are evenings when we struggle, we really struggle, the PACE clock is ticking, we don’t know if we can charge a suspect and we know quite well that after 6pm there is a likelihood that there is only one case reviewer covering all the cases in several regions. We end up waiting on the phone, and sometimes if you give up and bail a suspect, by the time CPS come to the phone it could get worse. Sometimes they will ask us to go and put an additional question to the suspect in order to decide whether to prosecute or not.” – Detective constable— Hertfordshire

The specialist departments shared insights about the most important aspect of their work which most said was the need to be honest and communicative with victims. Several also indicated they were inclined to concentrate on acknowledging the lived experiences of victims in order to build a better picture of events and focus on managing expectations adequately. They also shared that this one aspect of their work was the most delicate and most difficult because of the legal caveats set out by the justice system outside of policing and the guidance regarding approved professional practices that they work with.
The expressed impact of this was parking⁵⁸ or listing crimes for no further action⁵⁹ or no crime⁶⁰ and focusing efforts in the interim on maintaining contact and communication with the victim. This would involve facilitating support and protection for the victim to ameliorate the risks of continued harm and safeguard the victim.

In the case of the vulnerable adults’ teams at both police forces, this was a complex task. Noting that the victims they work with are vulnerable, some being unable to understand they had been victims of crime and others lacking the cognitive capacity to protect themselves, the work would often involve liaising with third party organisations such as care homes or care providers to elicit information and discuss, plan, and agree safeguarding measures aligned to the needs and circumstances of the victim.

“We have to check out care homes, examine whether the incident is reflective of systemic organisational problems or whether it is the actions of individuals., meet caregivers, speak to family, social workers, statutory organisations who have interest in the victim and their welfare we need to secure agreements that will ensure the victims are safeguarded from further crime” – detective sergeant—

In the domestic violence unit, the provision for victims was complicated by the demands and expectations of the crown prosecution service and governed by approved professional practices. Irrespective of how compelling and how emotionally charged the crimes they investigate leave detectives; they are not able to become emotionally or personally embroiled in providing direct support to victims.

“We cannot give them money or housing or offer them a bus fare to the police station. Each of these things sound like normal, standard things and many victims expect it. They believe

⁵⁸ Parking a crime is a term used to describe cases where crimes have been reported and evidence is deemed inadequate with respect to prosecution thresholds but there is scope to continue to gather evidence to satisfy this.
⁵⁹ No further action is a term used in policing to indicate that a crime has been alleged and investigated but the police have found limited or no grounds to base or further an investigation or effect a prosecution.
⁶⁰ No Crime is a term used in policing to specify that although an allegation of crime has been investigated, it has not been possible to establish or representatively bring about a conclusion on the investigation that will lead to a prosecution.
we should be able to get them out of their situation, find them accommodation and get them funds to escape abuse. But in a court, when the CPS are prosecuting, the perpetrators solicitor will ask them what we gave them or how we helped them. If we helped them, then we are accused of offering inducement for statements or encouraging... forcing a victim to make accusations in the hope that we will give them help so we can persecute rather than prosecute a perpetrator” – Detective sergeant – Hertfordshire

“ It can sound cold, or unfeeling, but the information we give to the victims, what we ask them, what we tell them, how we can help them, it all has to be done by referring them to non-profit organisations who are able to counsel them, give them support for the practical things...all we can do is investigate the crimes and seek justice, if we do more, we fail the victim” – detective constable – Hertfordshire

Conversations with the non-profit agency staff collocated with the domestic violence unit revealed that they were well qualified and aware of approaches to take when supporting victims. They highlighted their interest in finding out about the problems and experiences of victims. They would use the information they gathered to determining underlying causes, current, and present risks, and financial concerns in order to support high risk domestic violence victims. They were also positioned to share information with the police officers should disclosures be made which could support the investigation.

“Every case is different, and when it comes to control and coercion, it is very hard to support victims who may be in denial, have learned behaviours of patterns of abuse in the life and predisposition to abuse.” – Domestic Abuse Practitioner – NGO collocated with police—Hertfordshire
All specialist teams asserted that information was important to their work. Additionally, they all agreed that communication was a valuable tool but one which they use with caution to prevent compromised investigations and or increased risk to victims. As a result, although they communicate in teams, they expressed valid rationales behind maintaining mini silos for some of their work.

7.7 Conclusions to the chapter

The practice of policing involved persistent risk evaluation which revolved around acquisition and use of information, application of organisational and practice knowledge and interaction and communication using technologies to make decisions. Internal communications were characteristically functional, focussed on delivering information necessary for understanding risk, managing interdependencies, and containing crime. External communications were essential to facilitation of a police response with a significant dependency on third party communications to gain awareness and knowledge of crime.

The observed cultures inclined toward shared understanding despite concerns expressed of the emergent policing role attuned toward diverse and non-traditional policing duties some of which required delivery of duties in roles that police have limited specialism or training on such as medical and sociolegal contexts that generally sit in the scope of ambulance services including mental or child/adult social services. Meaning making was collaborative and there was demonstration of unity and joint effort to achieve goals despite the limitations evident due to the nature of technologies available.

There was a difference between officers in the lower and higher ranks, particularly in the ways of working with information and technologies including duties related to managing risks and making decisions.

Police officers at the two forces demonstrated adaptability, accepting new tasks and new ways of working despite challenges and difficulties. There was clear understanding of the
value of information and insight into ethical issues was demonstrated in many ways, particularly seen at the initial stages of response where victims and citizens invariably give access to their information, homes and personal space. This was also demonstrated in the approaches taken to safeguard and afford dignified treatment to victims of social ills and crimes as well as detainees who were held in police custody.

A majority of officers indicated that the work of policing had evolved and changed, and they recognised the importance of accountability in their work. The diversity of the work was evidently due to increased demand and pressure from medical services and local councils.

“The job has evolved to become more about dealing with mental health issues. The thing is it has us shifting a band aid on issues and moving on” – Sergeant – Hertfordshire

“As response officers, the hardest part of the job is that we often never really get to find out how it all went in the end” – Constable Hertfordshire

The mixed views about police practice gave rise to some emergent domain summary themes related to contextual police practices with regard to communication, information use and related ICT use is summarised in table 1.
### 7.7.1 Thematic summary

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<td>1. Accepted as critical to efficiency, effectiveness, and efficacy 2. Demonstrated as critical for information management and sharing 3. Uptime and availability, ease of use complicate and precipitate working cultures, attitudes, and perspectives about use of information systems.</td>
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1. IS considered Critical for day to day work activities 2. interpersonal communication and communication using technologies such as radios, information systems and databases considered highly important and helpful for a variety of policing tasks 3. use of the systems is constrained by specified practices and complicated by workarounds to ameliorate the limitations of some key information

1. IS considered an essential tool for gaining in depth information and informing analysts 2. Considered essential to support compliance with approved professional practices
| Communicating through daily briefings | 1. Valued face to face briefings Less inclined to attribute value to the force threat level sign. Briefings focussed on instructions, guidance, and information on what to do when out in the community responding to crime and patrolling  
2. Perceive senior staff briefings as less reflective of understanding of the nature of their role as response officers. | 15. Value daily briefings and networking, viewed as a means of interacting, brainstorming, and sharing problems, solutions, and updates.  
16. Briefings focussed notable incidents, resourcing, threat levels and public and political oversight and relations | 1. Varied purposes of briefings depending on role and rank.  
2. Lower ranking staff briefings in person, Higher ranking staff briefings virtual  
3. Lower ranking briefings share material information about crime problems and issues, Higher ranking briefings focus on strategic problems and concerns.  
4. Variation and pluralistic nature of information systems and mediums used to compile information limit seamless knowledge management and access to business intelligence on demand |
| Working culture – unity and togetherness | 17. Perceived distance between lower and higher ranks  
18. Evident and expressed concerns at distance between control room staff and operational staff | 19. Expressed awareness and knowledge of junior officer roles with some disconnects due to absence from active policing.  
20. Role perceived as one earned by ‘rite of passage’ through knowledge and experience | 21. Communication between officers at all levels and communication skills in general considered important and valuable expressed by all ranks and staff  
22. Potential for building stronger teams and communication by enabling more senior staff presence and involvement in operational duties  
23. Scope to boost morale and improve the sense of togetherness and co-ownership of problems if senior staff are more hands on.  
24. Shared perception of communication about and around challenges requiring allayment of the fear of being judged or reprimanded and embedment of a ‘feeling’ that problems are shared/co-owned |

**Table 1:** Information, communication, and related ICT use domain—thematic analysis summary
Chapter 8: Typification of the police information and communication cycle

The information and communication cycle at the police forces was more of a web as illustrated in Figure 11. Each department required information to function. Most of that information came from the public or third parties to begin with, but in some departments, there was an additional need to seek information from other sources external to the organisation which was often satisfied by accessing databases such as the police national computer (PNC) or federated search engine (Fedsearch). At other times, information would be sought by using various legislative powers to access information as part of investigations or in the process of preventing harm or endangerment. Information moved to and from police officers face to face, through electronic means such as email. It generally moved through various departments by recording incidents, crimes, and cases on information systems. During fieldwork, exploring and enquiring about the movement of information revealed structuring linked to how information is transmitted. Several permutations were observed in the practices and behaviours related to information each aligned to responding to the specific situation and involving practiced implementation of procedures. There was order to this, but the order varied depending on the perception of the specific individuals involved.

Most of the activities in the control room, the custody suites and administrative or person to person duties by police constables involved persistent dependence on information and communication. Without the information from third parties, it would not be possible to respond to crimes.
Figure 11: The information and communication web at the police forces
As the image above indicates, information gathering, sharing or review was also at the centre of the communication that occurred between departments, focussing on, or related to informing the process of criminal investigation or enquiry. Information was also shared to inform and support the planning of resources and delivery of administrative services. Each individual had their own way of doing; however, their expressed purposes were aligned.

In some cases, information and communication would be segmented with communication and sharing of information within small groups of officers who all had the same incident to handle. At other times, information use, and communication would be within large groups, such as during briefings. This exchange of information was informal yet organised. Officers engaged in the informal exchange of information when they met each other in routine briefings and in the force report room. They would sometimes discuss locations prone to persistent crime and share their experiences on the job sometimes seeking advice from one another.

Observations revealed that the flow of information is cyclic with several situational interdependencies. The information cycle within each sub-cycle was dependent in one way or another to that of the others, each contributing to the organisational web as shown in Figure 14. *The information and communication web at the police forces.* The wider organisational cycle consisted of sub-cycles, each with its own characteristic processes and tasks. Processes were aligned to areas of work or departments purposes, giving rise to tasks, and in some cases, tasks would give rise to processes, each of which were structured around purposeful use of information, analysis and evaluation of information, use of information and storage of information.

Technological artefacts such as telephones and airwave radios were used to enable communication within the sub-cycles. Body-worn cameras enabled the capture of new information, and laptops and computers were used to enable access to information systems
and databases. Information systems and databases to log/record new information, query and search existing information and store records.

The storage of data on information systems doubled as a means of communication, transmitting information to others who might have an interest in it and informing those who might require informing. It also provided a means of meeting statutory demands for police record keeping.

8.1 Sub-cycle I – The initial police response

One sub-cycle involved frontline police officers and control room radio operators. The cycle would begin at the point where an incident would occur. It would flow from the citizen to the call handler through a telephone and then be communicated through information systems to the radio controller. The radio controller would then transmit information to police officers using airwave radio (a technological artefact).

During observations, information received was subjected to evaluation by humans. This evaluation process varied from person to person but generally involved similar steps and practices such as searching multiple databases and asking motivational questions to establish the level of risk and threat of harm to citizens and police officers.

All staff expressed awareness and demonstrated the use of a range of risk assessment models, and in some instances, during observation, the information system (WebStorm) in the control room would prompt the use of certain risk decision-making steps such as the THRIVE risk model.

When observing staff, it became clear that each department requires variations to the same or similar dataset to complete their tasks or communicate effectively with linked or interdependent departments. sub-cycle 1 as outlined in Figure 12 shows the observed
communication and movement of information until it reaches police officers and simplifies the endpoint for police officers.

In the control room and in frontline policing, there are some commonalities with the information that was collected and or required. However, some commonalities were perfunctory, such as requiring an identity for a citizen where necessary or making enquiries to determine the presence or risk or extent of the threat of harm.

These variations in the purposes of the capture of information and communication exemplified the differences between the roles of the control room call handlers and the police constables. Both mediating concerns and communicating with the public, gathering information, and evaluating it with different work roles and similar endpoints.
Figure 12: Information sub-cycle 1 - Force Control Room - Response/Intervention officers
8.2 Sub-Cycle II – Responding and Intervening in incidents

Another sub-cycle is that of police officers attending the scene of a crime. Their role begins at the end of the initial evaluations by the force control room staff and begins when they are dispatched to an incident. Although each individual officer demonstrated a sense of agency, a way of doing which was unique to each person, their expressions of practice and carrying out of routines were quite similar, indicating that they were socially enculturated into their practices.

There were some differences in evaluation and action depending on officers. One of the observations made was that most officers, when presented with criminal behaviour or persons in distress, would adjust to the circumstance yet present calmly, maintaining their emotions until afterwards. The typical police response/intervention information sub-cycle is shown in Figure 13.

Despite this, it was apparent at times that the behaviours they encountered, and their own feelings featured in the decisions that they would take where they had the discretion to do so. In my own observations, people were not often pleased to see the police even if they had summoned them.

On other occasions, I experienced citizens expressing threatening behaviours alongside confrontational, aggressive, violent, and sometimes antagonistic behaviours to police officers and to me. The information they would seek and collect during observation was also used to corroborate risk, establish applicability of powers and legislation.

“The jobs, they’re about intervening, getting there and finding out what’s what, using your discretion, you know, arresting someone needs grounds, if you arrest someone and grounds are not met, the sergeant will send you back outside to go and handle the matter on the roadside” – Constable – Hertfordshire
“We don’t get to see the control room staff, it’s all by radio, so the best we can do is get the information they have, go there and then watch out for what’s happening, who is at risk, is there any danger to anyone, and make decisions based on information you now have” – Police constable – Bedfordshire

During observation, officers focus was on gathering adequate information, sufficient to establish the appropriate course of action as shown in sub-cycle 2. The treatment of information by police officers served more than one purpose. It was useful for them to have prior knowledge through information, vital for them to communicate with the control room to begin with, highly important for them to communicate and gather more information at an incident.

When observing attendance at incidents, it was essential for them to conduct an evaluation based on what they already knew and what they had learned at the incident such as what they were told, the answers to their questions, what they could see and what was happening. It was also important for them to have access to the technologies that would enable them to communicate and or query existing information or record new information.

Community policing and response policing in principle should denote the same reaction toward crime. However, community policing is heavily data led and relies on using the current ASPIRE system to look at crime analysis. It is a limited system and there are intentions to replace with a new BI system. Community teams are interested in using the data they have to limit high demand in order to drive focus toward harm. In the community policing analysis, they often find that the data they have for their response shows that most of their input is for ‘non-crime’ matters or on policing issues that have a low ‘harm-index’ which present with a high ‘demand-index.’

“We are finding that we are able to go back and look at crime data and we can see that we need to push for harm to govern demand. The incidents of reported crimes we get often
does not translate into a harm index. Demand should not be our main thing (focus), Harm should not be the main thing, it should be harm then demand but we are still struggling to get a harm index crossover on locations using the crime data we collect.” – Chief Inspector – Bedfordshire community policing

For response policing, again the same issues prevailed because they asserted that their main role is to respond to emergencies. There is of course the risk assessment by the control rooms, and this is meant to limit and manage things but still leaves little time to work on preventing crime rather than responding to it.
Figure 13: Information sub-cycle II—Response/Intervention officers attending an incident
8.3 Sub-cycle III – Detention and Safeguarding

The third sub-cycle involved the custody suite. In the course of duty, constables who make arrests, take them to the custody suite. The work of the custody suite was observed as being largely administrative, facilitative, and pastoral. They would ensure the grounds for detention are met, establish the level of force used to secure arrest, ascertain, and confirm the identity of detainees and facilitate medical attention if needed. Should medical attention be required then the sergeant would seek input of the police medic, gain approval, and organise a police transfer log. A simplified illustration of the observed information and communication cycle during the booking in process is shown in figure 14.

The information gathered during the custody booking in process was for evidential purposes such as biometrics, blood alcohol and drug tests or for safeguarding such as details regarding health conditions and wellbeing. During discussions, custody sergeants at custody suites for both police forces indicated that communicating and rapport were the core aspects of their job. Many indicated that the rapport when someone was in custody enabled them to elicit safeguarding issues, on occasion to elicit disclosures which might aid investigation and in the main, provided a means of reaching out, to leave the detainee with a good impression of their custody experience.

While at the different custody suites, it was also evident that the personalities and behaviours of detainees, would give rise to various demands and at times various expressions of anger. The custody suites walls were fitted with digital panic bars to maintain enhanced safety levels in the custody suites. If touched as would be likely in the event of a struggle or scuffle, the bars would set off an alarm which would alert all officers in the vicinity.

The custody suite also collects information on release of detainees to establish wellbeing and ensure that the detainees are safe to leave and do not require further interventions.
“When they leave, once they’re out that door, it’s not as if we can do a thing, but at least if we have been nice and become their ‘friend’ while they were in here, they might tell us if they intend to do something to hurt themselves and we can act. Other times, you know, they’ve decided to change their lives in the short time they have been with us, and we can refer them to community drug rehab services and other agencies.” – Custody sergeant – Bedfordshire

“We can’t influence the investigation, but we can influence their perception of us, just to give them a human touch, make things seamless for them. Not everyone who comes here is going to be found responsible for what they are accused of, we must keep that in mind.” – Custody Sergeant – Hertfordshire

Overall, the staff were observed maintaining a communicative approach to themselves and detainees. Most processes were smooth, impeded only by failures of the information system due to sudden outages and on other occasions due to complicated behaviours from detainees.
Figure 14: Sub-cycle III—The custody booking in process
8.4 Sub-cycle IV- Investigations and Prosecutions

The fourth sub-cycle included here is a generalised overview of the information and communication cycle in specialist departments. Rather than account for one specific department, key processes have been illustrated to give insight into the various points where risk is evaluated, and decisions are made on the basis of information that is received or acquired in the course of investigations. The cycle is illustrated in figure 15.

Most departments agreed with this simplified model, and several indicated the model outlined aspects of their work that they do without thinking of it as a step in a process. Overall, the specialist department officers regarded the information collected at the force control room, in custody and by frontline officers as valuable. In all cases, specialist officers indicated that the quality of the information was important enabling them to have a good starting point for further investigations.

They highlighted the most difficult part of their role was not being present when incidents occur and being reliant on statements and various accounts of events. Additionally, many indicated their interactions and communications with the crown prosecution service was a challenging one. They found communications laborious and at times felt challenged by the demands for further enquiries, given the PACE clock\(^6\) could run out while trying to meet those demands.

“If I had a wand, I would wish for technologies that could let us see what was happening in the home before we got there, what is the experience of this victim, what is really going on, if technology could do that, yes…” – Detective constable – Hertfordshire

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\(^6\) PACE clock is a term used to describe the legislated limit on the time that an individual can be kept in police custody in relation to a crime case for the duration of the case as stipulated by the Police and Criminal Evidence Act of 1984. Ordinarily this is capped at 24 hours unless special conditions apply, and a senior officer approves such an extension. For investigators, they must complete all interviewing for a case within the 24 hours provided for by PACE.
In discussions, most of the specialist departments asserted that information and communication were essential for their success in investigating and prosecuting crimes. They also indicated that their roles required an understanding of the victims' needs including knowledge and experience of the approved professional practices relevant for interviewing, collecting evidence, and investigating crimes.

8.4.1 The investigative technologies wish list

On what specialist officers and detectives wish technology could co:

“Where technologies are concerned, if I had a wish, it would be that we could see what is really going on, what has been going on in cases of domestic violence. Often we see the same victims, sometimes victim-perpetrators as well, many victims who recant, refuse to support prosecution, return to the person who we’re trying to prosecute, and yet again and again, they will call and we make arrests and we are in a problem situation, how do we push for prosecution of someone without evidence?, how do we know what is really going on?, we cannot see (…. we have no intel, no information) anything that is happening until that call, and when victims recant, or when they go back or meet their partner even when there is a restraining order, we are constrained, all we can do is contain the risk we know about, we cannot figure out what went on before, what is ongoing, what will happen next, if technology could get us all that information, show us what has been happening, what is happening, yes. that would be it.” – Detective sergeant – Domestic Violence—Hertfordshire
Figure 15: Sub-cycle IV -- The specialist departments
8.5 Sub-Cycle V – Informing leadership decisions and strategies

The final sub-cycle is that of the entire organisation with consideration for the various pieces of information that are collected and logged by police staff and police officers. This cycle is illustrated in figure 16 which shows the process of movement of information from various departments in the policing organisation to police leadership teams and analysts.

The analysts have the task of piecing and organising information into data sets and subsets that inform or provide insight into specific areas of policing at each organisation and analysis of information that is used to risk score individuals of interest on the basis of their links to crime and the risk of their involvement in crime.

Analysts were aware of the criticality of their duty to police leaders and in discussions with them, they expressed an understanding of the underlying ethical concerns around exploitation of information. They asserted that their core interest was in information accuracy and relevancy.

They also indicated that they were inclined to work with what they have by way of tools to exploit data and that these tools were not at a level or standard reflective of extensive use of artificial intelligence. Instead, their work as asserted was to do with detailed characterisations and categorisations, a data sorting process to identify markers and flags that provided insight into criminal behaviours.

It was relevant to consider the continued exploitation of information produced as a result of these cycles. Insights about use of advanced technologies to exploit information at the police forces were ambivalent. Staff had limited insights into how this could help the police force and many expressed views that it was unlikely the police force could afford to do so using modern approaches such as artificial intelligence and advanced metrics.
Others highlighted concerns about the ethical aspects of the use of advanced technologies such as intrusion of privacy while others highlighted how their use could damage police legitimacy and credibility.

“The use of AI, yes, it’s a necessary development, for policing, you know, we need to advance. But the thing is not all advances are for policing. We have to think of the bigger picture, we are policing people, and we still have to police them after we visit our innovations on them. AI changes what we can call reasonable suspicion and it can open us up to attacks”
— Inspector— Bedfordshire

8.5.1 Reflecting on strategic information exploitation

“So, imagine this, sometimes we have concerts with popular artists the children love, or premieres for movies that are for the kids. What a lot of parents don’t know is that they’re not the only ones out there. Sexual predators will also be there. One could say AI, you know facial recognition will tell us who is a registered sex offender. Well, it could, but so far, the technology seems to find mostly people who were not the person the AI thought it had found.

Back to this concert now, Mr ordinary is with his wife and three kids, and we pluck him from the crowd because our AI said he is a prolific sex offender. We take him aside, there’s crowds with other parents there right, the parents who he sees when he takes his kids to scouts and whatnot, and they see him being pulled out, they already judge him, he must have done something. Then there is his wife, she is confused, the children are confused and maybe in the end he tells them to go on ahead, this shouldn’t take too long.

But actually, in the end, we hold him there while we get our facts all checked, we decide we need to do a biometric check you know make sure he isn’t out there with someone else’s identity. By the time we are all done, he has missed half of the show he paid a huge amount to watch on opening night and he is not a sex offender, he is just Mr Ordinary. Everyone has seen him bring pulled out of the queue to go to the van, people have a remarkable amount
of trust in these technologies, they believe they can’t be wrong. So, we have technically accused him, judged him, and punished him with our move. We have dented or put a question over his reputation and so much more. If that is what AI is then I think, it is best we stick to the older methods till we are sure what is what. – Chief Inspector – Bedfordshire
Figure 16: Sub cycle V The organisational communication cycle showing information flows to police leaders
8.6 Conclusions to the chapter

Communication and information were interdependent at the police forces. One being required to facilitate action on the other and vice versa. From the organisational perspective, the movement of information across various work streams was essential for the continued evaluation of risk and strategic planning. The information generated by operational policing served as a means of developing organisational memory, but it also formed the basis for understanding and planning resource allocations and policing activities.

There was some variance in the overall use of information and modes of communication with the lower ranks being more involved in face-to-face communications while the higher ranks were more likely to utilise virtual communications deferring to face-to-face interactions for some aspects of their work.

Operational workers involved in police response and investigations tended to be involved in the act of aggregating information before and after attending incidents and or during information. This was primarily for the purpose of determining actions to take and making decisions on the fly as they sifted through information seeking an understanding of inherent and hidden risks and markers that indicated the potential for harm. It was also an essential part of work related to prosecution of crime.

Senior officers were mostly engaged with the bigger departmental or organisational picture, using summaries of the information collected through response and investigations including the nature and volume of crime, statistical outputs regarding work efficiency and overall response and investigation indicators to deduce and enable decisions to improve capacity and overall response. They were also tasked with using the information to manage concerns that might influence legitimacy, community relations and the overall impact of crime on the community.
Overall, the insights reflected the complicatedness of police procedures. Each procedure requiring acquisition or use of information was shaped by the specific characteristics of incidents. The risks varied depending on the case trajectory, and people (who were often highly changeable). Decisions were influenced by the knowledge and experience of the police officers and guided by legislation, approved professional practices, codes of conduct and organisational internal policies.

Staff expressed awareness of the ethical concerns around information collection and use, however most argued that their work being reliant on information and in most cases being triggered by supply of information, they explained that it was hard to apply ethical balances to information about crime beyond the legislative because crimes are personal and involve exchange of personal detail. They also indicated that they apply appropriate redactions to information shared with others often following a stringent process to determine the basis of sharing and only sharing what is legal, maintaining a practice of sharing only to satisfy requests that are legislatively sound.

Police leaders expressed an understanding of the need to have some form of oversight regarding information use, however in discussions, none of the police forces indicated they had an independent ethics team to review their use and exploitation of information. Some indicated they depended on their awareness, application, and adherence to the management of police information (MOPI\textsuperscript{62}) guidelines.

Information was valued and exploited to support work processes and officers handling information asserted their awareness of privacy, data protection and scope of sharing information with others. Officers were inclined to protect and safeguard sources of

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\textsuperscript{62} MOPI is a statutory code of practice on management of information. It provides police with a framework that sets out a common standard regarding how police should collect, record, evaluate information. It includes guidance on how to review the actions they take regarding information.
information. The work approaches demonstrated by response officers in observation inclined toward seeking information only when necessary or required.

For both organisations overall, understandings gained from observations and interviews suggested and supported the view that informing all staff at all levels, particularly those in customer facing roles of the strategic messages that were being shared with the public through corporate means was limited. Additionally, Insights from police leaders indicated they were aware of communication deficits and the majority indicated a desire to have closer communication and interactions with the younger and or more junior staff.

The sub cycles reinforced understanding of policing processes, highlighting the marked interdependencies between various strands of operational police work providing as discussed later in this thesis a foundation that could support structurisation of an epistemology of police information and communication cycles.
Chapter 9: The Construction of police knowledge

The information cycles outlined in the preceding section gave rise to enquiries around how police knowledge is constructed. Two areas of construction emerged from discussions and observations. The first was the construction of police knowledge related to the acquisition, retention, management and structuring of information to support organisational repositories of local crime and incident data and the second was construction of police practice knowledge related to the intrinsic knowledge, awareness and experience police officers acquire over time.

9.1 Construction of police knowledge

Police knowledge was observed to be the by-product of the various information and communication cycles illustrated and described in the previous section. Using insights from observations, it was possible to characterise police knowledge as the knowledge held within the organisation about crimes, criminals and criminal investigative activities and processes for policing purposes.

From the point where information was received in control rooms, processes were observed that set out to determine credibility of information before recording it as knowledge (referred to in policing as intelligence). There were some limitations to this, and staff expressed understanding of the way the value of information could be affected by the source and the unseen circumstances.

The force control room also had specific measures in place to ensure personal information related to informants, crimes and incidents were not removed or taken out of the control room. They would apply a risk assessment model to information received through emergency phone calls, questioning the informant to establish further qualifiers that could give the information value such as how, when, who, where, what, which and apply practiced
inflections that would demonstrate urgency, empathy, interest, or support to motivate the informant to give detailed accounts that would provide a picture of incidents and events.

When transforming information into data, the policing protocol for recording information removes the thick descriptions stripping the knowledge gained of all but essential detail. As a result, a call requesting assistance that might have been received as

“I am with my brother and a dog; we were crossing Main Street when we saw a man with a machete. He has attacked 3 people and he is attacking more. I think he is 5 foot tall wearing a red jumper with number two written on the back of it. I am hiding behind a black car on the road near wadwin’s café. The car has a white sticker that says transform.”

Might be recorded as

“Immediate, high risk, sus armed, machete, 5ft male, in red jumper, has sign 2 on back, known for gun crime, recent prison rel, 2 pax injured, inf nr wadwins, behind black car wt. sticker”

Although the staff stripped the more detailed descriptions, for the purposes of the control room, the information included in the data entry was a sufficient record of knowledge. It would be enough to enable radio controllers to set response timelines, communicate the current risk level, details of the suspect, the location of the informant and the ongoing risks and threats. The information could also typically as observed inform a control room inspector of the potential need for a critical incident team to be sent and it informs officers attending of the nature of the risk.

During observations, this knowledge would inform police officers about persons known to the police before. In the wider organisational context, the information was also of value to analysts, who might be looking for specific types of incidents or individuals with certain
behaviours, characteristics, or modus operandi. The information was also important for tactical operations as highlighted by officers.

“Say we are planning an operation, some people are out there listening to the briefing and some of us hear that, and we go and look up all the details, we find out every last thing about the persons we are going to encounter. When we get there, being that much more informed prepares you for what is sometimes called the unexpected, but actually, it’s not unexpected if you had intel on the system” – Chief Inspector— Bedfordshire

When officers attend an incident, the information they collect is also added to this initial information. They were observed relaying updates by radio to the force control room for this purpose. Once they leave an incident, if there are any updates but no further action, they will relay this to the control room. They would also update the records linked to people and places on the Athena information system with any information they had learned at the incident which they believed met a policing purpose and could be of value for policing in the future.

Officers were observed using the laptop or computer to access Athena to add intelligence. On one such occasion, I enquired about this, and the officer concerned explained that he had formed a habit of using the add intelligence layer to the information system because he had needed to do a search on an individual and he found the intelligence tabs in Athena opened areas where information could be entered and continued to use them.

“We probably got training on it, but you’re not going to carry a manual around, the system is hard enough to use as it is, so if you are not aware of how to do this, like most people aren’t, then people won’t use it. For me, it’s a good way of recording what I saw when patrolling. Thing is though, not everyone uses it or knows how to find it, so the intel might not be as useful as it could be.” – Police constable— Bedfordshire
In specialist departments, similar detailed accounts would be recorded on case files such as
detailed statements, police officer statements, information about various linked incidents and
details of evidence relevant to a case.

“Many of the people we see, are the same people, repeat victims, some become victim
perpetrators in the end. We never really have the full picture, but what we do learn over
time, what we record, helps us get the right help for our victims and over time, it helps us
end the cycle of abuse – Sergeant – Hertfordshire (IPV63)

“We have to let the employer know that an investigation is ongoing, the person will probably
get suspended from work until we complete our investigations, but a lot of our work involves
going through large amounts of documents, by hand, you need that trained eye to find
evidence. It’s not the sort of evidence you add as intel to a case, its little pieces that take a
bigger picture” – Detective Sergeant— Hertfordshire

Frontline police officers showed attention to protecting information by ensuring they used
their police notebooks to record information. Although the use of the police notebook was
not prevalent during observations, some officers did use them. They described notebooks as
a valuable way of writing information down to use or refer to later and as a record that could
be called in evidence if required in the course of prosecution of a crime.

In specialist departments, police knowledge was a little more complex. Sometimes specialist
departments would not record information on the police computers for fear it could be seen
or accessed by other officers unaware of their current investigation and inadvertently
released or used in a way that could impede their investigation.

63 IPV – an abbreviation for intimate personal violence. Crimes involving physical, emotional abuse managed by Domestic Abuse Investigation and Safeguarding Unit (DAISU) at Bedfordshire and Hertfordshire. Some aspects of this work are managed Public Protection Unit (PPU) at Bedfordshire police and the Safeguarding hub and vulnerable adults’ unit (VAU) at Hertfordshire police.
One of the possible problems I envisaged with this was that it could present a risk to other officers should the information be necessary for them to evaluate risks of attending an incident that could occur in isolation relating the same persons during the ongoing investigation or when police officers on patrol found themselves dealing with a person who was part of an ongoing investigation. In conversations, most acknowledged this could be a problem, but also felt that there were times when information needs to be kept within a small group to prevent larger threats to security.

“From our control room where we have the dedicated channels to prevent breaches in domestic violence cases, to when we have serious criminals under investigation, at the very best, if another officer is unaware and they encounter the person, they can see on the system that an investigation is ongoing. They could use their discretion, sometimes not arresting someone quite yet, but logging intel on the system or they can make contact with the case owner, there’s other ways…” – Detective Sergeant – Bedfordshire

“although it would be a small team of officers who would know what is what and so on, the thing is that most of the persons we investigate in this kind of way, they are sometimes not the ones you will find on the streets coming to the attention of those on patrol, and even if they do, sometimes it is necessary to make an arrest, but they do get released unless it is a very serious crime and the CPS request remand until the person comes before a judge, so yes, can be hairy for investigations, but overall, we find ways, some things are common sense, using initiative” – Inspector— Hertfordshire

9.1.1 Analysts and constructions of knowledge and intelligence

Analysts at the police force also indicated they rely on police knowledge, case files and crime records for their work. They are able to aggregate and analyse data on crime, anticipated crime concerns based on prison releases, persons with known associations in crime and historical demand.
Analysts raised concerns with aggregating and analysing data asserting that for policing the information they work with requires close examination and extrapolation. This extrapolation depends on the quality of data such as errors, omissions, and incomplete information. However, it also depended on human abilities, despite automation, they still needed to check and sort data physically.

“We have to go through stuff by hand, even when we have the software, it’s not a case of pumping information in and getting answers out, you have to check the links, connections carefully, to make sure you are not miscategorising anything and double check the quality of the information you are using” – analyst – Bedfordshire

9.1.2 Analytical tools

Concerns were raised around the tools with which to do the job. One concern centred around the suitability of open and market mature tools for analysing policing data. Additionally, concerns were raised about placing absolute faith in computational software and the costs and logistics related to commissioning or acquiring specialised software. Analysts highlighted the complex process of conducting data quality checks on current data indicating that historical data held in less accessible formats or moved from legacy systems were likely to embed and or be expressive of historical errors. They also highlighted the precariousness of basing future decision making solely on algorithms that might not understand legislative shifts and context of local tacit-tacit knowledge. They also acknowledge that there was some promising scope offered by various algorithmic tools but indicated that it was highly unlikely such tools would be authorised unless analysts could explain the algorithms in terms that could be understood and rationalised by police leaders.

“Checking and assessing information, there are so many types of software out there, but we can only use a small budget, so we have to use what we have to get the best output we can for the leadership team” – analyst – Bedfordshire
When discussions were raised about the use of advanced technologies to exploit and enhance police knowledge, staff and officers provided a range of insights.

“We are not quite at the algorithms stage where we sit and compute and rely on it, when we use systems that compute probabilities, we still go ahead and check it over, especially where youths are concerned, we have to try our best to make sure we don’t get the information wrong” – Analyst – Bedfordshire.

“We have data, it’s all there, but we are not using the data and we cannot use the tech available to us. We are not using tech that allows us to export the data available to us. Apart from that, yes, historical information might lose value, people change over time, so maybe it is not as relevant. Well, what’s the alternative? That we have nowhere to start from? Okay start with a blank sheet of paper, but then even if it is blank, you will still have to manually search for a starting point on information about places, people, and incidents, you must start from somewhere and using the existing data is better than nothing” – Chief inspector – Bedfordshire

9.2 Construction of police practice knowledge

The construction of police practice knowledge was different, individuals all had different approaches and perspectives. Despite the hierarchical setting, each individual was predisposed to a different experience because their time in service could involve work in varied areas and each incident they attend and each team they work in have different levels of expertise and knowledge.

The construction of practice knowledge was social, personal, and driven by experiences on the job. Officers receive shorter training than was previously afforded to recruits and are on the job some six weeks post training. They are provided with manuals and reference material and paired with more experienced officers. This enables them to learn about the ways of working and the procedures.
Some of the more experienced officers were also new to the job with less than three years in service. During observation, some police officers would complete work experience logs. The newer officers would learn by watching, seeing, and doing and have to complete their learning log with details of various incidents.

The police forces had a professional practice education scheme tailored around a national vocational qualification in policing and officers had to complete certain tasks and procedures in order to satisfy the learning outcomes of each. In some observed cases, this sometimes created a scramble to arrive at an incident if there was a likelihood it would help a new officer achieve a learning goal, but most of the time, they simply acquired this in day-to-day policing.

Observing the expressions of knowledge from officers and making enquiries, many indicated that they had learned on the job over several years. Younger officers tended to defer to and use the information systems to log and lookup knowledge and intelligence, the older officers tended to do the same, but they were also a walking wealth of local knowledge which they simply knew and could recall when required.

Overall, the officers demonstrated awareness of means and ways of storing and sharing knowledge, most preferring to acquire knowledge on the job and learn about areas while patrolling. Some officers would routinely record crime intelligence, others would record and talk about it to other officers, and some simply discussed it. The indication was that officers were not completely cognisant or habitually inclined to use the information systems for intelligence logging on the fly and more inclined to do so if there was an incident they were called.

Various officers demonstrated varying levels of knowledge of processes and procedures. During observations, they were seen asking each other how to conduct certain processes, often in cases where processes or procedures had changed. Most of the police constables
deferred to their Sergeant for advice and guidance with the sergeants sharing their expertise and views.

“We are not here to spoon-feed them, they need to be able to think out there, make the right decisions, and being a second pair of eyes, ... that is helpful” – Sergeant – Bedfordshire

“The environment, the work, things change as time goes on, getting my kit on and going out there with them at the weekend, it is a good way to see what’s new, to talk to them, to give guidance on what to do, just be there for them... to remind them I am one of them” – Inspector – Hertfordshire

9.3 Conclusion to the chapter

The construction of police knowledge and police practice knowledge in the context of organisational knowledge were understood by senior members of staff. However, there were inconsistencies with the mechanisms for maintaining this knowledge in an agreed way. Staff demonstrated capacity to engage in tacit and non-tacit information sharing but the practices around each were not emphasised or clear. The value of maintaining information related to the prosecution of crime was prioritised over the value of inherent knowledge that officers acquire over time in service.

There was limited scope to retain experienced officers in training roles at both police forces and there was no evident or highlighted mechanism for officers who had experience to pass it on outside of in work mentoring of new officers and or informal training.

Most finishing officers were able to complete handover processes with their predecessors, but often this was not possible. In the main this was due to officers coming to the end of their service who had been unable to take time due in respite and leave while in service over many years spending their last few weeks or months on leave.
In other cases, it was due to staff moving into new roles where they were needed urgently due to staff shortages leaving little time to brief their successor. Additionally, the hierarchical system at the police forces imposed certain practices. When officers qualified and met professional requirements for a raise in rank, it included an increase in resource investment by the police organisation.

As a result, it was not the done thing to keep an officer who was now being paid to do more in a role where they would be doing less and or performing a role that could be filled by someone of lower rank. The general practice then was to move officers who rise in rank into roles commensurate with the ranks expeditiously.

Senior officers acknowledged these limitations however they explained they were inclined to focus on where and how they could acquire information that would drive crime response while making efforts to ensure operational staff with experience were placed in positions where tacit – tacit knowledge sharing could be most effective.
Chapter 10: Construction and reconstruction of police information systems

A range of information systems were observed in use at both police forces. At Bedfordshire, and Hertfordshire information systems came into broad use in the late 90’s.

“21 years ago, when I started, there was no tech in response policing, the only real tech was the UHF wireless radio, in the call centre we had these plugin DOS systems that held very little information, just date, time and location. In custody, it was paper, then a similar DOS system on a little computer in the corner, and gradually we moved on to a point where every constable has a computer to carry around.” – CI Bedfordshire

The core systems at the two police forces are WebStorm command and control used for logging calls received at force control rooms and Athena software suite used for crime case management, intelligence management and custody management. In addition to this, the control room have access to information systems and databases such as Fed search, the police national computer and the police national database.

The main information system used in the control room WebStorm is used for logging data about calls received. The information recorded on WebStorm is a means of sustaining local record keeping, Emergency and non-emergency requests for assistance about incidents involving crime including incidents that required reporting to the police such as road traffic incidents are initially logged on this system. The system also provides radio control operators with a snapshot of incidents including associated risks and threats. They would then relay this information to police officers tasked with response duty. Police officers also rely on this system as a means of accessing details of incidents to which they are assigned.

The main information system used across the police force in all operational departments is Athena. Athena comprises an information system software suite that includes case management, custody management, intelligence management, staff allocations management
and report recording. Police officers across the forces utilise some or all of the functionalities of the suites in their day-to-day work. For response officers, Athena is used for administration of incidents that give rise to a criminal case and reports that summarise actions taken during incidents they attend. They used it to build cases, author reports, look up and record intelligence and review cases they had pending in custody. Views of the system varied, with many using it out of necessity rather than enjoying it. Some of the older serving staff remembered the delays and problems prior to and immediately after adopting the systems.

“The problem, or well, what we live with is we have these people and they come, and they do these really ‘up there’ presentations, they show us all the wonderful things the software can do, then they ask us a load of questions and we tell them what our work is like, and they look like they’re listening. Then we go to training, then more training, and more, then we come in to work one day and the old system is gone, the new one is there, but it’s nothing like what they told us in the presentation. So, we ask questions, then we figure it out eventually, all those wonderful features were add ons and we can’t afford it, so we got the plain one, with nothing they told us would be there and just when we decide to accept that, we get a black screen.” - Sergeant Bedfordshire

The police custody suites use Athena to book in detainees, record safeguarding information and monitor bailed detainee cases. Specialist departments involved in investigation and prosecution of offences also use Athena mostly in conjunction with Tuserv to monitor detainee interviewing queues in the custody suite, review, update and manage cases and record intelligence. Control room staff also use Athena to log and record reportable offences and incidents that do not require a police response. While detective teams and specialist departments expressed that they benefit from and use the Tuserv platform routinely, whilst response officers asserted, they found its use for in field case compilation difficult.
Of the two information systems, Athena was the dominant IS system. It was at the centre of all administrative duties for officers at Sergeant rank and below. It featured prominently in most processes and tasks at the police forces and became a representative talking point when administrative duty was broached.

10.1 Adopting information and communications technologies and information systems

Although police information systems and associated practices were noted to be structured around collection and recording of information that is required, errors may still occur as humans are in charge of delivery and recording of the information, additionally discretion plays a role in interpretation of information and decision making.

Workers are used to following certain steps or stages when considering and evaluating the level of risk to citizens and police officers preceding and including decision making, the activities involve communication, interaction and exchange of information and knowledge. Which necessitates interactions and “communication” between humans and technologies.

In the policing environment, they engage with a variety of information systems and databases, which when considered also present them with steps and stages, each step involving the entry of some form of data or the querying of data in order to record information in a format structured to incorporate the procedural and legal caveats that must be met to provide the “correct” response.

What is unique about these information systems in policing is that they actually do not provide the correct response, they guide and support a response mediated by humans who are able to process the information in much the same order as they have been trained to procedurally because it is structured within the information system in that order.

This is not an absolute truth however, because where the systems are structured around collection and recording of information that is required to prevent errors, errors may still
occur as humans are in charge of delivery and recording of the information, additionally when discretion in policing is considered, the information provided may or may not give indications to a person assessing risk around what kind or type of response to mediate. As a result, the information provided and that which is available on police systems may or may not give indications to a person assessing risk around what kind or type of response to mediate.

Neither the radio or body worn cameras work of their own accord, the police officer must switch on his body worn camera at every instance where he/she/they rationalises, perceives, or deduces based on his risk and situational awareness that there is evidence to record or again going back to the risk aversion, that there might be cause to “back themselves up just in case”. The radio systems require an officer to push a button to speak and it is considered good practice for them to listen to the comms traffic on the police channel as they go around on their patrols so there is a constant stream of chatter in one ear all the time. But to engage physical steps must be taken.

On several occasions, some of the officers link their handheld radio to the car, so that the information is broadcast much like one would listen to the drivetime traffic music show on a local radio station. I am struck by just how full my head is when I get home, trying to recall incidents and events and double check field diary or notes and at the same time replaying some of the incidents I have lived through simply by hearing the hubbub around them on the radio.

The information systems available served as a means of guiding and supporting the police response, but this response was mediated by the humans who did the work. They were in charge of processing the information cognitively and administratively in much the same order as they had been trained to procedurally because the information systems are structured around the presumed order in which they should think, assess, and record information.
However, given that practices change, and evolve depending on approved practices, legislation, and policies, it continues to be difficult to maintain a balance.

Beyond this, the police leaders were able to give insight into the journey that led to the adoption of the Athena software service, yielding insight into how it came into use. Several revealed that the greatest motivation for taking on Athena was the desire and need to act on the findings and recommendations of the Birchard Inquiry report\(^4\) which was released in 2004. When discussing the way in which the systems had been implemented with police leaders, they outlined the rationale behind the approach to switching over from the old systems to the new for adopting the systems by introducing them on one day.

Regarding the switching over, the assertions by senior officers was that the systems could not be phased in gradually due to a history of change resistance described as a falling on old habits. In the past when technologies were phased in gradually, many staff and officers would try the new systems and once problems arose or if they had a difficulty, they would go back to the old systems leading to the use of new systems and legacy systems at the same time.

Practices of this nature had an impact on the management of information and coordination of processes. Should a case be structured on a legacy system when intelligence and custody records were on a different and new information system, they could not be linked as there was no interoperability between the two. Furthermore, the process of investigation or case building would be impacted by delays with potential loss of data integrity when transferring records.

\(^4\) The Birchard Inquiry was a public inquiry into child protection procedures at Cambridgeshire constabulary and Humberside police force. The findings highlighted concerns around effective intelligence management and record keeping. It also highlighted problems with the efficiency of information sharing between police forces and other agencies. Such as disparate development of different local IT systems at police forces with limited action to address problems and a lack of a national intelligence IT system.
“Everyone knew we would switch over, they had all been to training, some more than once, with major switch overs like this one, we needed everyone on the same page. If there were going to be problems, and there were serious problems in the first few weeks, we at least knew that we had crossed the most difficult bit...moving over.” - Superintendent – Bedfordshire

The perspectives shared from the discussions indicated that there was awareness and understanding about the reasons why new software was implemented. From conversations, many were aware and vocal about issues and concerns with the previous software. Some of the concerns they voiced were about procedural adequacy, such as having scope to record and share intelligence within the previous systems, or meeting and or complying with policy guidance around sharing information.

Some officers also expressed their views about the way in which the systems had been phased in. From various accounts, the process involved a hard shift from the old to the new.

“Our problem is problematic devices and inconsistent uptime. CMS2 was a really lovely system, because it could prepopulate fields and shift though cases quickly, I joined community the day Athena came on and it was absolute chaos” – Police constable – Bedfordshire

For the last 7 years, plans have been in the offing to remove airwave radios as they are considered highly expensive and replace them with ESN and a digital 5G push to talk system dubbed emergency services mobile communications systems. The system proposed by the home office is only used in Korea with a population and terrain unlike the UK.

“We barely have internet and there are black spots all over the countryside, and the batteries on these new web enabled devices don’t last long once you’re connecting to networks here

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CMS2 is an information system that was previously in use by the police. The system part of a group of information systems previously used by police including a custody handling system (CHS) and Operational intelligence system (OIS).
and there, so I expect we will be carrying chargers in our pockets or cars and charging
constantly and if we are using them so often the batteries will probably be fried in months””

10.2 Achieving interoperability and national information exchange

Despite adopting information systems with the core goal of sharing information across police
forces, the participants admitted that the best that had been achieved was shared systems
with a handful of near neighbours. There was still no way for all police forces to share
information using one unified information system.

“The goal of the edicts was that we should have shared systems. Athena hasn’t solved that,
yes, some forces use it, but not all, so we are still far from information sharing through
systems, then there the clicks, too many clicks, slow loading, the complex interface and too
many drop downs… but it’s easier to access intelligence” – Police constable– Bedfordshire

There were also still several lookup databases in use in the force control room including
PNC. Some officers admitted that there were some mechanisms for asking for or sharing
information across police forces, but these were not seamless or interoperable with their own
information system.

“We have some tools to reach other police forces too, but it’s not the same as being able to
login and check details.” – Police constable– Bedfordshire on national police IS
interoperability

10.2.1 Vignette - The other side of the fence

During observations at Bedfordshire custody, an opportunity arose to learn about systems
used at other police forces. Officers had come from Gloucestershire to Kempston to meet
and interview a detainee who had been arrested following a wanted person of interest bulletin
from Gloucestershire. One of the first indicators that technology and practices can differ in
police forces was the discussion the officers had with the custody sergeant when they
realised that Bedfordshire still uses cassette tapes and has no digital loop recording system in their interview rooms. The officers from Gloucestershire were used to recording interviews digitally and immediately having access to them on their Niche systems.

In the conversation that ensued, they asked who I was and ended up agreeing to give some insights about their police force. They indicated that instead of constables working on cases at the onset then moving them on to another department to complete investigations, their police constables had a combined role of investigation officer and response officer. Their custody suite was in a different place from their call centre and the former two were not located with their police headquarters and response teams.

In my observation, they had more modern phones with sturdier looking interfaces and were enthusiastic about being able to work and access the same systems using their phones and laptops simultaneously. For core administrative tasking, they explained that they use a platform system called UNIFY on their phones and laptops. By logging into Unify, police officers could access the Niche interface, Webstorm®, Pronto®, Javelin mapping tools, GCIS®. These information systems and databases enable the police officers to create cases, access missing persons databases, log evidence, file reports, store intelligence, access detention records and raise tickets and penalty notices. This provided some insight into the views that officers at Bedfordshire and Hertfordshire shared.

“Niche is actually a better system as it gives us more time and it is a quicker system too. It takes details from command and control and prepopulates the database, .... For example, for domestics if we can have all the details on WebStorm, the history transferred over then we can focus on the rest of the information” – Police constable – Bedfordshire

Pronto is a mobile application used at some police forces to manage ticket issuing digitally.

GCIS is evidence logging tool used by police officers and investigators to create asset tags and log evidence.
“We could not share information with other police forces, even near neighbours, everyone was just doing their own thing. With Athena, with the number of forces using it now, we share information, it still isn’t perfect, not all police forces use Athena, some use Niche, but at least we are kind of on the right track.” – Sergeant – Bedfordshire

Beyond this, the importance and value of interoperability between the various information systems used by police forces was exemplified by two distinct observations. The first was in the force control room where staff at Bedfordshire were able to easily take on and support tasking of incidents taking place in Thames valley as a result of a system crash. The ease of transferring emergency response to Bedfordshire was possible because of interoperability between the STORM system used at Thames Valley and that used at Bedfordshire.

The second was the encounter with police officers from Gloucestershire in the custody suite at Bedfordshire. It was apparent that their own processes were impacted by the limited interoperability between the Athena System and Niche amongst other things, given they could not login to their own software at the police site, nor transfer custody records over seamlessly or update the case records without the need to request and extract data from Bedfordshire to update their own system.

10.3 The information system and work

The insights from police officers about the Athena system were diverse. Staff spoke positively of the concept behind the information system service, however when it came to the ease of use, functionality, availability, connectivity and overall performance, staff were less enthusiastic. In observations, many of the difficulties they highlighted were evident as were some of the positive descriptions.
“Athena on the whole has more layers, more capabilities than CMS and being linked with the 8,9 forces, it is a good way to share and have intelligence access, previous failures were mostly due to not sharing information, so I get it, but it is so slow that the benefits are almost clouded.” – Sergeant— Bedfordshire

They were seen when performing tasks that involved the software making accommodations, acceptance, and resolute representations with respect to their use of the systems.

“Compared to the CRM, is the trade off losing quick crime report and case building worth it, well yes and no, the yes is we need joined up systems with all forces or as many as possible, the no is that there could and should be a better way of doing that without using up so much response time.” – Police constable— Bedfordshire

“The custody flow (on Athena) is not designed by a police officer or practitioner; that much is clear. It works as if someone has attempted to incorporate PACE and meet all its requirements by adding it all into the system. It works, but is not quite as good or friendly” – Inspector – Bedfordshire

“We make it work, Athena is good, but it is a slow system that takes up a lot of time. Okay on online reports as I do them often, so it is pretty much second nature. But we have many problems generating case files because on response, we often refer them on to other departments like GBH cases or DV etc, and they need so much information in so many different sections, then it’s difficult with Athena” – Constable – Bedfordshire

In the main, most were of the view that although the software service had marked inadequacies, it was known that the software would not be changed or scrapped in the near future. Most expressed hope that the systems would improve and disappointment that their views and the known complexities around the software seemed to be side-lined.
“I’ve never used any other system, so I don’t have a comparison, Athena is difficult to use and time consuming.” – Police constable—Bedfordshire

Police officers expressed a range of views about the scope to request updates and amendments to the information systems available

“We have a portal where we are supposed to submit requests. We supervise them, we can see what they struggle with, we also struggle with these things in Athena, but sending a feature request is a formality. We send it, and that’s that, nothing else happens, we don’t even get feedback to say someone looked at it.” – Sergeant—Bedfordshire

The way in which the software service prevailed over operational duties was significant. Every key operational administrative duty relied on the single point access to the software suite on Athena to satisfy crucial aspects of operational police work. The problems therefore and the praise, emerged as the dominant feature of insights into the use of information systems.

10.4 Making do and adapting – Making Information systems work

There were some interesting routines around the use of Athena by the custody department, while observing the booking in process, I noticed that the custody sergeants would exit the Athena, open a word processing document, ask more questions, type answers, then copy and paste this into a free text field in the Athena system.

“Now that we have shared systems, we also have to consider that feature changes mean every police force using the system will see or have to cope with the change. So instead of changing things, we get told, use this word template to write up the information, then copy it and paste it into this spare field.” - Custody Sergeant—Bedfordshire

They explained that although Athena was custom made and structured around legislation and to some extent policy, when policies changed such as the need to record information
which was not already built into the question interface, they would have to type it up and add it to a designated free text box in the information system. They also indicated that it might be that other forces using the system do not need the field and as it is a buy in software, changing it would be a change for everyone including those who do not want or need it.

“Well, we have the extra questions about disclosures to the officers before custody and we have to put them somewhere, these are the times when using the system means you have to remember what to put where, but we are getting used to working around anything Athena should do but cannot do.” – Sergeant – Bedfordshire

10.5 The trials and tribulations of an information systems service

At the police forces, there were two groups of constables, those who had been in service prior to 2018 and those who joined afterward. For those officers who had been in service prior to 2018, their perspectives gave insight into previous information systems and current systems. Those who started after the new systems were in place were able to give insight into the new systems.

“The best part of Athena is that I don’t have to use it that much if at all anymore. On the positive, it is easier to see intel, to see if the person you’re dealing with is a suspect in a crime. Intelligence can be stored in layers but if you don’t use it often, then it is counterproductive.” – Inspector – Hertfordshire

When officers reflected on the previous information systems compared to the current, they indicated that there were some improvements, but those improvements came with some negatives such as connectivity.

“We have good technology, but it all depends on connectivity and availability. That all said, overall, the technology we have, compared to that available in other places and at other forces is good” – Police constable – Bedfordshire
“I know the decision about what systems we use was down to so many variables, and it’s the same with the system, some are core problems with functionalities that should be there but are not there like team working on files, some are restrictive, making you go through many tabs to get information in.” – Inspector—Hertfordshire

“we had this system before called MG Wizard, and we could work through case building easier, now, you have to figure out the time you need to do a case, depending on uptime, network, it’s hard to know how much time, and even how long is good time and then you have to finish and get back out there or leave it and go when it’s really busy and you’re needed. ” – Sergeant – Bedfordshire

10.6 IS Availability, Connectivity, Ease of use and functionality

Many perspectives related to interoperability, availability of the system, the ease of use and functionality of the system. Several also related to the sophistication of the systems available.

“The technology is just not as high as you would expect it to be” – Police constable – Bedfordshire

Officers admitted that many of these were historical problems present since they began to use the systems. “I reckon whoever chose Athena did it in a hurry, and they listened too much to what the software company had to sell and didn’t really understand that most of the selling points were extras.” – Inspector Bedfordshire

Others offered comparative insights holding Athena against previous systems they had used. In most cases, they articulated their difficulties in practical terms, highlighting loss of productivity and data as a result of the problems they encountered. Many expressed views in the context of information sharing highlighting their acceptance and understanding of the rationale behind the software implementation but this was always accompanied by
expressions of concern given the persistence of problems which dominated their use of the software.

“The systems we have are very different from what we had previously, and one of the snags with these new systems is that every aspect or element of an incident requires the creation of a separate and distinct entity on our systems. Thinking for example of an incident where a family of two adults and four children are involved, we have to create records for six people. If there are two officers and say four statements and each of us took two statements, then each has to record each statement, and well, we have to wait in line to do that, the two of us cannot add to or access the same case at the same time, and if the case involved custody and they logged into the persons record, even if they log out, it could lock it to them for hours.” – Constable – Hertfordshire

10.6.1 Vignette – 4 human resources, 1 software service and an entire working day

During analysis, I was drawn to my experience on the first day I started immersion at Luton. I attended an incident with four officers at 7am, the incident involved multiple witnesses and two arrests. The officers expedited their work by dividing up statement taking. At the end, they were required to build a case. It involved writing their own police officer statements and typing up the statements from each of the witnesses, logging body-worn camera footage and recording any evidence that had been collected.

Only one officer could work on case building at a time. The other four set to writing out what they intended to put on the case. After two and a half hours of working, finally the first officer was nearly finished, and he called to his colleague to prepare to add his statements. In the conversation that ensued, Athena crashed. I was confused when the officer said “its crashed” because all I could see was a black screen when I looked.
My next statement was “Well, you can recover the last saved file when it comes back on and continue, I guess” and before I finished my sentence, they all gave me a pained look and exclaimed in unison …. “no”

The duty sergeant eventually released me to the streets with other officers to do something else around 1pm, by the time I returned to the record room around 430pm the officers were just finishing the case preparation.

In the end, the attendance at the incident and taking notes including processing at custody took two hours. Preparing the case to forward to investigators who would need it in order to conduct interviews with the arrested parties quickly to avoid PACE clock defaults, took 6 hours. Those officers were on a 7am to 7pm shift and they had spent eight of their 12-hour shift, building one single case involving two arrests because they could not all work on the same case file at once and the system required to build cases unexpectedly become unavailable while they were working.

10.7 When things go wrong – Information systems Outages/Crashes

During observations, some of the software for case building would stop responding or crash and it affected officers differently. If an officer were in the middle of building a case or recording information, the information entered prior would largely be lost and work would grind to a halt.

There were many times when I would observe officers building a case and suddenly, I would realise something was wrong when someone would say

“Is anyone else still able to get into Athena” to which someone else would often reply “it crashed”

On occasion, Athena crashed while I was observing in the custody suite at more than one site. The upshot of such an event was to print a data dump of the last working record of
custody entries on Athena that day, then sort these. Next staff would have to standardise check times for all detainees to ensure none missed timed checks, and then they would have to take off any important information about the detainees for reference.

System crashes would delay the booking in process, prevent data and person lookups and cause some confusion. Staff would also have to re-enter all the details when it came back up. The frontline officers were also affected by the system crashes, given they could not access Athena for intelligence lookup or case building once it had crashed and there was no known mechanism for holding or recovering work in progress or saved progress on cases. A crash would simply erase all progress.

Despite these difficulties shared by police constables, during observation, all of them were seen at one point or the other sitting to do their administrative work. Almost all of those who provided their views expressed that the time it takes is one of their biggest concerns.

“At some point, when you realise the systems, we have complicated and slow data management and putting in information that takes up one page will take two hours, you also have to decide that if the time you lose on the four shifts where response is your main job is not enough to finish it, then it waits, compliance is important, but so is welfare.” – Constable Hertfordshire

Although newer police officers could not make comparisons, the most common view was that the Athena system had good qualities and features, but these were marred by difficulties and time lost when using it. Others felt that the features they were told about during briefings about the new systems were not the features in the systems they had received.

“I think Athena is really good and yes it gives officers the ability to put intel in on the fly, but by the time we took up Athena, it was already out of date and know, you have to go in there and put in all the information you need in order to get it back out. With Athena, pulling
out information is limited because information is not always connected.” – chief inspector – Bedfordshire

“For all that money these companies take from policing, well, the public purse right, to give us something we can work with to make sure we work smart and work right, then you find out the hard way that it does not support collaborative working. One case record, only one person can update it. Even google docs is better than that.” – Police constable—Bedfordshire

10.8 Managing data quality

A data quality team was collocated with the police force control room, and they were tasked with reviewing every case file recorded for data inaccuracies, errors, and inconsistencies. Most constables indicated the team’s role was important in the longer term and valuable for standardisation and investigatory purposes, however the upshot of their work was that many constables could have files returned increasing their administrative burden.

“Every report is QA’d, errors can still be made and each time we do any kind of referral or case file or report, it is checked for data quality. My view is there is the risk of a level of response to data quality that may increase burden. If there are errors such as missing or incorrect data, then the officer has to redo it. If we want to add extra information, then we can create tabs for additional information” – Police constable—Bedfordshire

“Crime reports are usually sent to the quality assurance team; however, the team will only check to see if the data entered into the reports meets the standards and if the forms are filled correctly then the case files or crime reports get returned to the officers to complete the process. As sergeants, we can intercept the crime or case records and review them for operational and procedural completeness and ensure that we support our officers to ensure

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68 QA refers to quality assurance carried out by a small quality assessment team at the police forces. They check reports and case records created by police officers and flag inconsistencies such as errors and omissions, then return the files to the originator for amendments before they can be passed on or filed.
... for example where victims are concerned or where cases are going to the CPS that nothing will impede the case completion’” – Sergeant – Bedfordshire

“Our quality control team do not necessarily get involved in ongoing crime calls; they’re simply located with us. But they do have a measure of experience and they can sometimes support call handlers by giving guidance while calls are ongoing, about the information that needs to be gathered” – Oscar I Control room inspector – Bedfordshire

“The thing with having so few officers is that they are tasked multiple times and there is little time to take reports or file case notes and case build. Earlier today I was on Omni and we were reviewing the record and case quality. Granted we have recently changed process on some of these reports and there are teething problems, however there are so many errors that we have to keep sending the case records and reports back” – Data quality officer – Bedfordshire

10.9 Conclusion to the chapter

The core information systems at the police forces were central to police processes, enabling communication, collaboration, and administrative duties. Despite efforts to maintain interoperability, the various systems in use were marked with limited interoperability despite having many interdependent components. Some of this was due to the limitations of third-party software, others were due to the unavailability and difficulties with securing adequate software with capacity to manage all tasks or facilitate the necessary interoperability.

The core software in use by the majority of staff had been adopted and implemented some months before the start of this research. Its provision as a software service presented the police forces with a means of sharing local policing data with one another under their close

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69 Omni-Gen is a data quality software used by the police forces. It enables data discovery and cleansing of corrupt, incomplete, or invalid data and tracking of data quality trends. The software also enables police to set rules based on Hadoop sources and file formats to assess data quality of case records and reports. The software also enables data analysis, merging and profiling.
working relationship. However, the software service presented a number of problems from an organisational perspective.

Despite the advertised features, the software continues to require investment from the police forces to achieve capabilities necessary to use the service and technical expertise with which to exploit its availability. These investments were challenged with difficulties marked with the unwillingness of the software service provider to provide access to functionalities that would enable the police forces to determine and enable interoperabilities with their other systems such as access to the software API\(^70\). This in turn challenged the investments the police forces continued to make by hiring and training information systems and technologies staff and teams to support their continued digital improvements.

Additionally, the software had since its inception been plagued with persistent problems related to connectivity, availability, offline working capability and caching of data during outages. This had a significant impact on the facilitation of administrative duties by a large proportion of operational staff.

The issues mostly affected staff involved in preparing cases, investigating crimes, and managing essential operational response, reducing their capacity to work efficiently, delaying police response, and impacting on capacity to meet demand given limited resources and the need to align with lean practices\(^71\). While insights were shared about the hard approaches to implementing the software, other concerns related to the ease of use of the systems, highlighting the complicatedness of software development and implementations.

The organisations had invested significantly in training staff repeatedly while awaiting the software which was some four years late when it was finally delivered. Given the pressures

\(^70\) An API is an application programming interface. It enables software developers access the fundamental interface that drives software functionality. Access to an API enables determination of points within the interface where connections for transfer, sharing, communication and links can be made or developed with other software and or systems.

\(^71\) Lean practices are aligned to the removal of waste and inclusion of value in processes. It was originally coined by Toyota, a vehicle manufacturing company. It is often applied in policing alongside Six sigma as a means of reducing waste, increasing value while achieving cost reductions through process variations.
to embrace systems with the features the software promised alongside a desire to limit continued dependency on legacy systems, the implementation involved removal of existing systems at the same time as implementation. This led to significant disruption which resolved within two months.

The continued problems regarding ease of use were reflective of insights shared about the limited engagement with end users during the development of the software and the closed approach to development which excluded police technologists from the process beyond perfunctory consultations. Furthermore, the prioritisation given to building in statutory and procedural elements into the software based on police activities with limited understanding of the realities of those activities.

The outcome was ongoing staff dissatisfaction and exhaustion, loss of manhours, reduced efficiency and the potential for avoidance techniques including problems with long term data veracity and value.

Overall, it was useful to consider that that most operational police officers have more of an affinity for responding to incidents being desirous of making a practical difference which is far removed from being desk bound with administrative duty. It was therefore likely that their perspectives included a measure of unspoken reluctance to carry out mundane duties such as data entry. That said, during observations, staff were often enthusiastic about being at a point where there was potential to put evidence together in order prosecute those responsible for crime and harm in the community. This enthusiasm seemed to decline in proportion to their technological woes, evident they grappled with the various problems the software presented.

Their reconstructive response was to compensate, often moving to other tasks where possible and or seeking work arounds to manage the inadequacies or issues with the software. The
other compensation was to motivate camaraderie, knowing that they shared the same difficulties, they seemed to be motivating acceptance of their fate.

Their compensative behaviours enabled inquiry into views about ways to improve the software from officers of all ranks. This led to more understanding and contributions about what they considered ideal. Importantly, it also demonstrated that they were willing to co-own the and co-create solutions to their concerns. This motivated the inclusion of an analytic problem-solving process which is outlined in the subsequent chapter of this thesis.
Chapter 11: Cooperation traditions in policing

During observations at both police forces there were six streams of cooperative and collaborative work. Observed instances involved sharing knowledge, information and or intelligence, including interaction

The first was working with informal/private policing operatives, demonstrated during local public order operations. The second was interactions with hospitals and ambulance services during incidents requiring medical intervention and in the process of seeking medical attention for citizens at risk of harm or those destined for police custody.

The third was interactions with fire service officers in the process of responding to fires that required police attendance or were reported by police. The fourth was interaction with local councils with various sub-streams of police work involving contact with different departments. The fifth involved collaborating and working with non-profit organisations and or community agencies with respect to victim and citizen support that stood outside police remit. The sixth involved engagement with court services and the crown prosecution service.

11.1 Cooperating with informal policing agents

The first stream of work often came into play at weekends, during public holidays and events in town centres and public venues. During observation, police officers would be deployed to the areas where reveller numbers were expected to soar based on historical information already held by the police forces. A handwritten activity map outlining typical public order workstreams is illustrated in figure 17.

Some officers would be deployed to the local council or town centre closed circuit monitoring hub and others would be tasked with contacting private security or ushering managers at venues. The officers in the monitoring room could advise officers on the ground if they spotted suspicious activities. Those who had contact with venue security and ushers
would obtain hourly headcounts of patrons for records and planning purposes and feed this back to the officer stationed in the closed-circuit surveillance room.

Figure 17: Tasking streams—maintaining public order in communities at Hertfordshire
Once deployed officers were seen patrolling and observed intervening in incidents where revellers were in danger or at risk of becoming victims of crime. Intervention was often limited to advice, seeking medical attention or support to gain safe passage but in some instances, it involved intervening in and recording incidents of assault or public disorder.

11.1.1 Public order duty – nightlife and leisure

On a typical evening of observation, the nights would begin with assisting people who were intoxicated and sometimes incoherent. Most of the early revellers tended to be calmer and happier. However, as the evenings wore on past 9pm the terrain would change. The various businesses would begin to close one by one. As soon as one business would close some revellers would depart, but most would move along into the nearby venues that were still open continuing until there would only be a handful of venues holding significantly large numbers of revellers.

Once the final few started to close the situation would also change. Large numbers of people would exit the venues at once and as they emerged various incidents would begin to occur. Most were drunken brawls, but others were criminal activities. As I observed when closing time neared, many individuals would arrive and take up strategic positions near venue exits standing mostly in the eaves as though they were scouting for persons they know.

Loitering near the individuals revealed they were engaged in the business of grifting for clients who wished to extend the night in a range of interesting ways and individuals who were interested in acquiring intoxicants (drugs and barbiturates). I also observed some of the touts engaging with private security operatives with ‘handshakes and discussions ensuing.

Some private security officers were also seen engaging in various activities to encourage swift exit of revellers. Most altercations were between revellers who were displeased with
being rough handled, those who had lost possessions or those who were highly intoxicated arguing, quarrelling, or demonstrating various types of manic behaviours. There was limited coordination and use of different tactics by the private security staff mostly involving several large people piling in on one person. The common result was revellers sporting various injuries with damaged or lost property. In all cases seen, once the police officers saw such incidents ignite, they would rush in to intervene and stop the security staff, then take over and facilitate the departure of the reveller/s.

“We can’t really alienate them, but we have to make sure we step in quickly because those who get hurt will still see it as our fault, …besides, we need these people to leave and go home even if they don’t want to” – Constable – Hertfordshire

Once police officers took over their main activities involved encouraging and issuing warnings the revellers and, in some cases, issuing the revellers with a public order ticket/notice which would order them to depart from the area and or not return for specified amounts of time ranging between a day and four days.

Not all revellers welcomed this, and several would refuse to leave or leave and return. This promoted officers to arrest them, transport them to the nearest open train station (and in some cases the furthest) from the town centre or venue where they would be de-arrested and advised to get on a train and leave.

“You have to keep your eyes open, and you need to stay with officers because there’s more of them than us. The quicker we react the easier it is. “ - Sergeant – Hertfordshire

“Issuing these tickets, we don’t stop the businesses from earning or people from having fun, it’s a small town, these people descend here at the weekend from everywhere, we need to make sure they leave safe”– Constable Hertfordshire
“The public order tickets are a way of letting them know we aren’t here to arrest people, and it helps send a message that disorder won’t be accepted here. Makes sure people leave as well, its 3am, no one wants to be out here, but they do even when the club is closed” – Inspector – Hertfordshire

On my travels in many cases, most of the revellers who would fight and struggle needing many hands to put them in the back of a van would deescalate into weeping and pleading as the lights of the town centre receded. Despite this quite a few would walk back to the town centre and officers who did not wish to arrest them would repeat the process and conduct the de-arrests at stations further away.

The rationale behind this was clear. Queues at custody were long at busy weekends and in Hertfordshire, far from some of the busiest town centres. On occasion when I accompanied officers who arrested someone, the process from arrest to booking took four hours. It was known beforehand that the individual was going to be released in the morning without charge however it still involved driving some distance to the custody suite, administrative work for custody staff and police officers.

Overall, in all instances of observing officers on public service duty, they were severely outnumbered. They engaged in practices such as grouping together and communicating with each other while scoping goings on. They would gauge a fracas and surge in numbers sufficient to quell each before resuming their observations. At times they would respond to information from the officer in the closed-circuit monitoring office and convene at a location where police assistance might be needed. This was often in response to potential muggings and assaults seen ongoing via closed circuit cameras owned by the local council.

They also intimated that they would use public order duty as an opportunity to learn about local crimes and sometimes gather intelligence about criminal activities such as the touts mentioned earlier. They also indicated and were observed expressing understanding and
discretion when dealing with revellers. They were also observed showing an understanding approach to revellers, showing interest in welfare, building rapport, and deferring to warnings before forcefully responding to individuals who presented a risk or threat.

“all these years of doing public order out here, some things we get to learn to expect because we know about it, we get information from the council, security, the bars and so on, but there are problems with that too you know, sometimes the criminal aspects of it all, it’s some of the staff that supply drugs, but we then need to find a balance, are we tracing the wafting smell of something that smells illegal, or are we preventing breach of the peace and making sure the area is clear and these people on their night out don’t hurt themselves or damage property, and do we want to alienate the staff, it’s a hard call, figuring it all out. At least we know what it’s like out here, lots of people are drunk, many on more than alcohol, we just need to get them back on the train to wherever they came from. – Constable Hertfordshire

The conditions during public order policing were precarious and highly changeable. The police response was driven by information that was evident as they made their patrols. Their risk preparedness relied on information that was already known and held locally regarding reveller behaviours and numbers. Revellers tended to challenge, abuse and assault officers by approaching clusters and shouting and at-times pushing and attacking as they passed. Some showed levels of anger and confrontation, some of which I experienced, challenging the choices officers made to serve as police officers, surging toward police officers, taunting, and making various accusations in their intoxicated states.

The observed work involved police officers communicating with the private policing operatives, business owners in person and communication with the designated police officer in the closed-circuit surveillance unit by airwave radio. The inspector and chief inspector for the area would observe the developments and monitor the police response activity,
evaluating risks and making decisions to request reinforcements or withdraw the police officers from the area. The officers were also observed receiving information from the area chief inspector and the force control room regarding their activities.

They were seen using various tactics to communicate, cooperate and coordinate removal of individuals who escalated the risks present at the various venues and town centres despite their disadvantage in numbers. They also indicated their response was one that was refined through practice, intentional observation, quick thinking, and interest in ensuring revellers were left with good impressions.

11.2 Joint response activities with the fire service

Cooperative working with fire services was required in cases where there was a fire that required police attendance or in cases where fire service assistance was required to support police in an incident. Instances observed included the attendance of police sergeants and bronze officers at a fire outbreak and police attendance and fire service attendance at an incident where a person was in danger at height and a suspected case of arson.

“Our job is to attend in case any crimes have been committed, we escort the persons to hospital if need be and effect an arrest once they are treated. Other times, we need to take a statement and or record what they say about the fire incident. “– Sergeant – Bedfordshire

In the instances observed, the fire service bronze officer had a call sheet and information log at hand and shared this with the attending bronze officer. The fire service staff responded to commands from their own superior, while the police sergeant coordinated the police officers attending according to the requirements the fire service expressed through their response plan. Areas were cordoned off and clearly marked and police enabled swift evacuations. Police officers logged the incidents that were reportable as a crime and departed once the incident was contained by the fire service and the attending fire crew indicated assistance was no longer required.
11.3 Collaborating with local councils

The collaborative working with local councils was fraught with difficulties due to the unavailability of functional staff in the evenings and at weekends. Most of the notable incidents attended related to vulnerable missing persons, often children, young adults, and persons in the care of the local council. All incidents followed a similar pattern. In most cases, incidents would occur where persons for whom the local council was responsible would be placed in privately controlled secure residences and staff felt powerless to stop them from leaving or flouting the rules.

“A lot of the antisocial behaviour in certain areas, it’s the same young kids in homes over and over and over, we do what we can, but then most of them are already far gone, drugs, crime, they end up in prison if they haven’t been before” – Police constable— Bedfordshire

In one incident, officers had to transport a young juvenile to another locality because the warden for the home had decided it was not safe to accommodate the youth in the residence. The youth was subject to a number of court-imposed movement restrictions, involved in serious and organised crimes and prone to violent outbursts. One of these had led to an attack on another resident. The police communicated with the warden and made referrals to the local council, however as it was late at night, it fell to the police to organise suitable alternative accommodation for the youth.

In another incident, the local council staff notified the police late on a Friday afternoon of a young person who was vulnerable and missing. Police staff in the control room were able to search the last known location of the youth based on mobile phone use. Once officers had this, they were able to refer to the missing persons record for the youth to see if there were known locations near it.

They also searched databases for intelligence on persons linked to the youth. As a result, they were able to find and return the youth to the secure home. On one occasion officers
were observed using the ‘what three words’ tool to find a location where we went to search for a missing vulnerable person in woods.

“The kids have been wrung by the system, and they are looking for a way out, they will keep running and we will keep having to find them. It’s a vicious cycle. In the end, we see them gradually become customers in the cells.” – Inspector – Bedfordshire

“So, we kept on finding this young girl is missing and we are looking for her again. Every time we find her, she is equipped, she is definitely being exploited, but she won’t say who and where, so all we can do is take her back to the home and wait, she will be out again, and we will have to find her” – Constable Bedfordshire

With limited access to information from local councils, the police could only rely on missing person records which are usually created the first time an individual goes missing.

The missing person records are set up using images of the individual and a range of socio-personal information that give insight into known associates, known frequented locations and behaviours. It would also contain details of any health and social vulnerabilities including any detail provided by social care services.

The other sources of information were intelligence records on Athena intelligence management systems and STORM command and control systems. The former holding records of any contact with police that gave rise to information considered of value for prevention of harm and crime, the latter holding records of contact and or interactions with the police emergency call centre.

At times, the police would also make contact with British transport police by radio and at other times they would deploy drones or helicopters in the late hours to aid searches for individuals. Missing persons who were highly vulnerable often necessitated the diversion of
resources to search various locations and officers would complete this on foot going square metre by square metre in different locations.

“Wherever we think someone has gone, we have to continue to search for them. In colder weather, a few hours outside could impact on outcomes for the MISPERS, and they could come to harm really quickly” – Constable – Bedfordshire

“Deploying the helicopters costs a significant sum, now we have officers trained with drones and the dog teams, we can keep looking and be up and running quicker than waiting for a helicopter, but it needs people who have information, access to information that tells us where to look and what to look for.” – Inspector – Bedfordshire

During observations, this task was a hand on, an all-weather one, leaving each person involved emotionally charged. Searching brush and canal banks in the dark looking for something to indicate a person had been there was overwhelming. I found that if my observation shift ended when a person remained missing despite all efforts, I would struggle with that knowledge until I returned to field, concerned that they had come to some harm, yet hoping that they had been found safe and well as was often the case.

The work police officers carried out was limited by access and availability of information. They had no interoperability with local council services systems and no information access repository where they could access information that police would be entitled to regarding safety, risk, and vulnerability. Instead, they had to request information by email which was not immediate, delaying their response and potential investigations.

Cooperative work was observed between safeguarding departments at the police force and social care departments at the local authority. In a majority of instances workers would forward requests using standardised forms via email but the sharing was restricted to office
hours by external parties which did not help the situation for the police as most serious situations seemed to arise in the dark.

“There’s no one to call this late at night, send a referral, you might not even hear back, sometimes it goes to community so they can try to agree a plan for the young person. A lot of the time these kids go in, agree to a plan, wait a day, and run off again” – Constable – Hertfordshire.

11.3.1 Safeguarding collaboratively

Information requests from local agencies were processed at the police force safeguarding teams. As requests come in by email would be processed by police staff who search multiple databases to produce information summaries relevant to the requests. In most cases, requests for information were managed immediately, however in complex cases, the information requests would require meetings with different teams of interested parties from various local council and non-governmental agencies. This would include a representative of the police. Often the meetings would involve sharing/contribution of information to assist decisions for the overall social care for individuals and families.

“Sometimes, the work we do reflects a vicious cycle where the very people we rely on to safeguard will be the ones who fail. We see requests come thick and fast over the years and eventually from concerns for child welfare, they may become missing children from homes and or vulnerable adults or young adults who come to our attention due to crime” – Detective Sergeant – Hertfordshire Safeguarding

“We gradually become uniquely qualified to carry out our role which might be another officer’s idea of hell on earth, but the work we do is a necessity and of significant value” – Detective Sergeant – Safeguarding – Hertfordshire
“One observation here is that the requests for information are made by completing forms. The forms are explicit in asking for grounds. Agencies will write s17, 47,32,42 in the box rather than share pertinent detail. This gives the impression that the situation is open to abuse and there is no way to identify and follow up the grounds. With joint working agreements and arrangements, the motivation is to share, although this is not always reciprocated” – Detective Sergeant – Safeguarding – Hertfordshire

“We have request forms that need to be filled in so we can establish needs and evaluate release of information, and generally they are sent back with one word or an abbreviation of legislation, so we end up not knowing the why behind the request from social services. And our hands are tied, we don’t send the forms back and ask them to fill it in correctly, we comply” – Sergeant – Hertfordshire (on safeguarding requests)

The streams of work within the safeguarding teams also required information exchange and communications between the police force and third-party organisations. The information was used to conduct specialist safeguarding investigations which involve assigning risk and enabling measures to prevent further harm. In some instances, it could involve working with care homes, third party agencies and local authorities including statutory bodies to identify the risks and enable prosecution of individuals found putting others at risk or committing crimes against those who are vulnerable.

During immersion, the problems around information sharing affected operational response policing. They were often limited in their response and actions that would ordinarily be carried out immediately to safeguard others were delayed. The completion of referrals could take days to be actioned and it was not possible to request information directly from the local council staff on the fly. Instead, information requests followed an accepted formal route which placed the police officers at a disadvantage.
Some of this was ameliorated by instances where staff at the local council would call and offer up information. However, the sharing at such points was often characterised by limited sharing, often not enough to structure adequate responses without further requests for information. At other times, information shared would present officers with complicated situations that challenged their own judgement on the basis of what they could see and their experience.

Officers expressed discontent with overall cultures presented by social work operatives and seemed suspicious of their approaches and practices many of which did not align to the policing principles and practices to which they were accustomed. Despite this, several officers acknowledged that the work of social care workers was somewhat necessary, even if their practices when involving police intervention tended to slow or complicate police response, create problems, or challenge police legitimacy. At other times, due to the mop up nature of their duties, officers admitted to being confounded by some of the approaches social workers take.

11.3.2 Vignette: Managing Child Delinquency

During observations, an incident involving a young juvenile arose. A social worker had driven to a police station that was actually closed to the public with a home-made explosive in her vehicle. She indicated that she found the device while visiting the juvenile. A relative had found a contraption in the juvenile’s bedroom with various materials and instructions for making an explosive device.

Considering the seriousness of the matter, police officers were astonished when the worker arrived at the closed police station and on finding no one there, made a call to the police to announce that it was likely there was a bomb in her vehicle. A bomb squad was deployed to defuse the item; however, this required a more complicated approach given the item had
been moved and transported to what was previously a police station but was now a police training site.

In the course of the day, the police placed the juvenile in detention and interviewed by police. The process was longer than usual because the police had to secure attendance of an appropriate adult. Following this, while in the report room, it transpired that the same juvenile was now of interest in another incident. A member of the public had reported that the juvenile had deliberately scored and marked their vehicle.

The officer handling the matter was tasked with making contact with incidents that could potentially be resolved without police attendance. The officer would call the party/ies involved in the incidents and seek to reach a “community resolution” between them. If this was agreed, then the parties would be asked to sign an electronic agreement and the case would be closed.

In the case involving the juvenile and the other party, the juvenile’s relative had agreed to pay for the damages to the vehicle and apologise on the condition that the juvenile would agree not to come near her home or car again. Once this was agreed the officer now discovered the juvenile was already in custody. He therefore went there to get the agreement signed.

In a remarkable twist, some weeks later while in custody, a female called the police to request assistance because she had received threats of violence from a former partner who had just been released from prison. Oscar I in the control room took supervision of the matter and explained that the incident was on the face of it seemingly low risk, however it was deemed high risk for a number of reasons.

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72 A community resolution is a police approach to resolving antisocial behaviour and minor offences. It involves brokering an informal agreement between the two parties involved in the offence or between the police and an accused person. If an accused person admits guilt, the police consult with the victim to seek their views about an agreeable reparation such as a formal apology, compensation, or agreement to cease and desist without bringing a criminal case. If the victim is in agreement, then the case is resolved by acceptance of the terms of the community resolution and no further action is taken.
It transpired that the juvenile who had made the bomb was the son of the female who called and the male who was accused of making threats. Furthermore, the family were all members of a protected traveller community, and the female had a shunned status having departed from the community to live in a fixed abode due to a long history of domestic violence alongside her partners transient lifestyle which was characterised by persistent recidivism and imprisonment.

Given all these factors, Oscar I sought to achieve the best approach to prevent any impending harm or risk to the victim and an officer was dispatched to acquire a statement from the female including evidence of the threats while another was dispatched to seek the male at all of his previously known addresses.

Given the circumstances in the two incidents, the views shared about the role of social workers in the cases involving the family was not positive of promising. In both instances, the police officers indicated that the juvenile behaviour and continued problems the family faced were partly due to the approaches taken by the social care department when dealing with the family over time.

Invariably the police only had information that the local council would willingly give them, reliant on the family and calls such as the one from the social worker and that of the female to make sense of the situation facing the family and devise a best approach to keep them safe from harm. Upon reflection, given my awareness of the incident with the social worker and the explosive device and several others, some characterisations emerged.

Incidents related to parties involved with social services during police attendances often involved individuals whose lives seemed to have been altered by this involvement. Many juvenile delinquents had spent their youth in the care of local authorities and their continued contact with police was punctuated by recidivism.
Effecting enforcement and implementation of social services led legalities was challenging and officers would often be given conflicting accounts of incidents reported by social care workers. At other times, the intelligence supplied would be denied by citizens involved with them and officers would also be unable to find corroborative evidence. In some instances, citizens would report practices that were inconsistent and at times extrajudicial.

Most officers expressed a measure of exasperation when confronted with what was as it were, the residual effect of social services interventions. It was natural to conclude that the relationship and interdependency between social worker and the police was one that might need attention given the goals of the two should not be at odds nor should their practices and approaches to citizens.

The collaborative work between social care departments and the police was considered crucial for the management of harm and risk and essential to investigation and prosecutions in instances where victims required social support. The views shared around information sharing were common to police response teams and other specialist departments with the child and adult sexual abuse team highlighting they had the most difficulty with these problems. This gave rise to an opportunity to gather insights toward structuring co-owned solutions to the problematic situations using Checkland’s soft systems methodology. A summary of this analysis is included in the subsequent chapter.

11.4 Cooperating with healthcare workers

Cooperative work was also observed between control, frontline officers, and healthcare staff. The force control room had one mental health nurse present to assist call evaluation. At Kempston police HQ, there was a small team of cooperating workers, made up of one police officer, one paramedic and one mental health nurse available for the entire county. They engaged in street triage, attending incidents where the experience and input of a mental health nurse were of value. This necessitated sharing of information and expertise and
extended into exploring and identifying risks and making decisions that were attuned to the needs of vulnerable people.

There were cooperative activities and communication between police officers and ambulance staff observed. Some related to ambulance staff requesting police assistance, others involved police requesting ambulance support routinely or statutorily. At other times ambulance staff and police officers would be simultaneously dispatched to serious incidents where they would be tasked with working together in accordance with joint interoperability protocols for emergency services.

During observation, a pattern emerged. Police officers would regularly attend incidents where their support was requested by ambulance services. On each of these occasions the advance of support was expedited. In many cases officers would be tasked with providing input on police powers to compel highly vulnerable persons to comply with ambulance staff requests. In contrast, every observed instance where police requested ambulance attendance was met with a very slow response. Of note, on one occasion, officers waited three hours for an ambulance to arrive to assess and transport a patient. The unreciprocated cooperation practices had an impact on the police officers.

I attended an incident where a person had been arrested by police, then sectioned73 by the police under

“If we arrest and section someone, we cannot transport them to the hospital, we have to call an ambulance and wait for them to do that, then follow them and take over custody at the hospital. Then we wait, for the hospital to assess them.” – Constable – Bedfordshire

73 Police sections refers to the use of powers provisioned under Section 136 of the Mental Health Act. Under this act, police an detain and convey persons in public places suspected of being mentally ill and in need of immediate care and control to a place of safety such as a hospital.
At an incident I attended, officers had to gain access to an elderly citizen’s home to assist him as he had fallen and could not get up.

“The ambulance were called but they have not responded in the last two hours. All we know is there is an elder who has fallen, and his neighbours can hear their calls for help receding. If we can get in, then we can help until the ambulance arrive.” – Police constable—Bedfordshire

In the end, the rescue took about an hour and the ambulance never arrived. Officers gained access, reached the elder’s relatives who came to the address later, assisted the elder and left.

When police were requested to attend to assist ambulance staff with the transport of a patient to hospital, the contrast in timings was evident. The officers were dispatched urgently as was the case in each instance I observed in the control room or with officers on response.

“If the ambulance staff need our help, we have to get officers to them, the quicker we do so, the more ambulances are available for emergencies” – Control room inspector

It was clear from perspectives shared that police officer were aware of diminishing funding and staffing in other public services such as local council social care and ambulances. That said, the volume of assistance required from police to cover duties best suited to other services was significant. It also had an impact on police response officer’s demeanour, many expressing their desire to make things better as something that had become “mixed feelings, because this is preventing harm, but it is not crime fighting and that is what we are criticised for not doing”

In other instances, it was also evident that the shifting of workload to the police could have detrimental effects and impact on police legitimacy. In a matter which Oscar, I took charge
of while I was observing in the control room, a third-party individual from the housing department had contacted the police control room.

An individual had been found unresponsive at his home. The individual’s family requested ambulance support. The support arrived and transported the person to the hospital. Unfortunately, the person did not survive long in hospital, succumbing instead to death some ten days later.

The call to the Inspector was less of an enquiry and more of an accusation that the man had died police had not responded to calls for a welfare check with a demand for details of police attendance. The inspector was able to draw on the locally held records on WebStorm and Athena.

From these records the Inspector was able to give dates when the police were requested for a welfare check, the situation they found (each time that the individual required medical intervention and community care from the local authority due to long standing health problems and a substance dependency battle) and the demeanour of the individual (often uncooperative with what assistance and prone to furious outbursts).

Overall, the records indicated that following many confrontational welfares visits it had been decided that police would no longer go to the individual’s home to conduct such welfare checks due to the risk posed to police officers. Oscar I informed me that it was difficult not to respond to the query, however care was needed.

In the first instance, it was not possible to determine if the caller was a representative for the local council or the decease or why they required confirmation of police attendance. In the second, it was not customary for police to become involved in the death of an individual who was in the care of the hospital at the time of their death.
Finally, according to the specific records for their last contact regarding the individual, Oscar I was able to call up and listen to the call records. The police had fielded a call from a third party stating that the deceased person was at home drinking and consuming intoxicants with a request that the police go to the address and make the person stop drinking. There was no implicit request for assistance or a welfare check, nor was any information given that gave insight into any risk as a result of ongoing injury, or continued risk of harm or a threat to the deceased.

Subsequently, the deceased’s caregivers went to the address, found the deceased unresponsive in a rental property and taken to hospital. The decision that Oscar I made overall, was to query and review the risk decision, risk scoring and assessment and decision reviews including all contact from the individual and or their caregivers on or around the weeks before the individual had died.

“We have given details of the last call to their housing officer, but we also need to immediately conduct a review of the contact the individual and their caregivers had with the emergency control room. Because we are one of the last agencies with contact with the deceased and there is now concern that the individual might have a had a dependency, police would have been expected to seek medical attention and support the victim by bringing them to lifesaving facilities” – Oscar I – Control room – Bedfordshire

11.5 Collaborating with the third sector

The police also collaborate with non-profit organisations to support the delivery of victim support at a critical level. This collaborative working was observed in the domestic violence unit. Staff from a local charity are collocated with the police staff and they are briefed on domestic violence cases. Their role is to provide access to support that the police cannot provide such as accommodation and finances. In most instances, the collaborative effort supported the specialist team and helped them to focus on case investigation and avoid
prejudice or inducement. Information was shared on an as and when basis and limited to what was necessary to enable access to support.

“I have been here a while, I see loads of the same people come in and we cannot tell them anything, we can provide counselling support, guidance, but we cannot stop them from going back to abusive situations.” – non-profit worker at police force.

11.6 Cooperative work with the crown prosecution service

Cooperative work with the crown prosecution service was observed in specialist departments. This involved negotiations and discussions where investigation records and case records would be shared to facilitate decisions to charge a suspect with a crime and or identify what further evidence or investigations would be required to build a prosecutable case.

All officers in specialist units indicated that the police systems have limited interoperability with that of the criminal justice system and crown prosecution service. They also indicated they were more likely to defer to Tuserv for case preparation. They all indicated they struggled to motivate communications with the CPS. They cited delays to case reviews and some disregard for the limitations to retaining suspects in custody.

“One of the biggest issues a lot of officers in specialist teams face is long hours. It’s sometimes doing actual work, but at other times it’s a mix of doing work and sitting there, waiting, just waiting for hours on hold for someone in CPS.” – Detective sergeant—Hertfordshire

“No matter what we do, citizens always think that we have this wonderful relationship with CPS, and we are one and the same. The CPS put us through our paces, they also don’t exactly make allowances” – Detective sergeant—Hertfordshire
“Our case records are created and held on Tuserv, but not a lot of other departments use it the way we do. We create our bundles on it and forward it to the CPS and then we wait” – Detective sergeant – Hertfordshire

Giving examples, while speaking to a detective Sergeant, he indicated he had become so used to being put on hold to confirm if to charge a suspect that he would start to do other work to prevent delays to other cases. Importantly, he indicated that when a person was in custody awaiting an outcome, this could create complications with legal representatives.

In another example, another detective sergeant cited the problems with sending files to the CPS which would not be received or seen at the other end for several hours. He also added that when individuals are placed in custody, there is a limitation. For instance, if a person is arrested at 11pm and the officer responsible does not start until 7am, then eight hours of the PACE clock are already lost. In the remaining twelve, interviewing could take another 2 hours leaving 10 hours. Rather than delay the individual, unless the case is clear cut and a decision is quick, the department would release such an individual on bail pending further investigations.

He narrated that the CPS could eventually answer 4 hours later and ask them to re-interview the suspect to determine a number of points before a decision could be made. This would mean issuing a notice asking the suspect to return. Most would not, requiring response officers to effect their return to police custody.

He indicated that it often depended on hope that the person would be arrested in the day or at a time when someone was available in the department, or it might require the responsible officer’s return to the police site to interview the suspect. Invariably, often the PACE clock which is limited to 24 hours could end before interviews could be completed.
“Some of the solicitors know the predicament we are in, so when we bring someone back to custody, they simply take their time so that when they finally get there, we have next to no time left on the PACE clock. In the end, if we cannot charge that individual, it is rather odd to hope they commit another crime so we can get them next time” – Detective Sergeant—Hertfordshire

11.7 Conclusion to the chapter

Overall, the common perspective about cooperative working was that it required information sharing and knowledge both of which were limited and often not forthcoming. The other shared view was that the systems available to necessitate communication such as information systems and databases were not interoperable. External agency information was not readily accessible, and requests were often slowly actioned. Despite requests often less information than was requested would be shared and there was limited scope to query sources, veracity and establish value of information.

Relationships with the health services and the local authorities were considered the most difficult with the increased dependence on police to manage issues the health service and local council choose. In such instances, the limited sharing of information made the supportive role of police as first responders and or persons responsible complicated as they would not be able to establish risk adequately and might experience delays in identifying the best interventions to effect.

Overall, the police officers admitted their way of working was changing and they continued to adapt to the challenges of their roles. They also indicated that their work would continue to improve should other agencies who have an obligation to share information effect a meaningful and adequate means of doing so, recognising the urgency of police information needs.
Chapter 12: Self-actualisation in times of crisis and upheaval

The research reported in this dissertation was conducted during the global COVID-19 pandemic as indicated in the preceding chapters. This section provides insights around the impact of the pandemic on the use of information and information systems for risk predictions and decision making at the police forces.

12.1 The arrival of the pandemic

While in field, the first awareness of the impending effects of the pandemic were felt while I was at Bedfordshire police sites. Three months before the government of the UK announced a countrywide restriction to movement to contain the pandemic, a vehicle transporting individuals who were thought to be trafficked was stopped and the individuals who were found in the vehicle were subsequently brought to Bedfordshire police force’s custody suite in Kempston.

Soon afterwards, enquiries at the booking in desk revealed that some of the individuals might be unwell and might have transversed countries that had a high endemic rate of COVID-19 in their travels. At that time, there was next to no provision within the police custody suites for COVID. In fact, as I would later discover, the provision for police officers by way of safety equipment remained nominal during and throughout the pandemic.

In the hours following this, the custody suite at Kempston was shut down while biological cleaning was conducted. The staff at the custody suite were put into isolation and officers who were working at the site in Kempston, were diverted to Luton police station. As the situation unfolded, it became apparent, that some of the officers who had contact with the detainees, had also been in contact with other officers at Kempston, and some of those officers, unaware of COVID had simply come to Luton to continue with their work.
In the days that ensued, the site at Kempston would later be reopened, however for the officers, there was no government or local provision to test them and ensure they were not contagious. The offices were stocked with antibacterial sprays as a protective measure; however, the provision of hand sanitisers and the issue or masks did not occur until some three and a half months later after I had left the field.

While at the Luton site, staff tried to put a positive perspective on the unfolding global events. We would all take in the conversations with stoic appreciation and at times laugh at the prospect that if any one of us who had been in or around Kempston and Luton in December had suffered a bad cold or flu, it was likely we had been infected with and recovered from COVID.

By the time I returned to field in August, the pandemic had changed the way that the police worked. Interactions and interviews with many senior members of staff had to be conducted by video meeting. They all indicated that they had adjusted their working pattern to limit the risk of contracting COVID reducing access to police sites to staff who were responsible for core operational functions only.

12.2 Adapting to the pandemic

Officers indicated they were grappling with managing and translating information about legislations and policies in response to COVID and working to continue to respond to crime. The feelings expressed were indicative of concern with many worried about the implications of the pandemic and others about the potential demand that would arise because of legislation.

“The situation changes day to day, the legislation is moving so quickly and so are policies, and we need to, we are constantly trying to prepare to implement the laws and policies, crime hasn’t stopped”- Chief Inspector-- Bedfordshire
By the time I returned to field in person in September 2020, I could only meet with senior officers and interviews had to be conducted sitting at least 3 metres apart in rooms with open windows. While attending the sites, I could see that many officers seen in passing were wearing protective reusable masks issued by the police force while others were wearing personal masks. There was also access to hand sanitiser gels and disposable masks in some offices and at front reception desks.

Staff shared their perspectives about the complicated chains of sharing information and awareness of the changes to legislation indicating that the rapid pace of changes had left many police forces unable to plan ahead to deal with the workload. In the same stead, many also indicated that they were working hard to ensure they had preparedness and capacity to manage any demands and new duties aligned to new legislation.

“Because legislation is changing day to day, sometimes more than once in a day, we have to institute practices that accommodate problems and incidents related to COVID. The approach we have chosen is the right one, we want to comply with government guidance, we must, but we have to think about the impact of this, .... all this going on.... on people too, how they will see us.... we still have to police these streets when COVID is over” – Inspector – Bedfordshire

Information played a key role in the pandemic with many officers also indicating that the scope for the government to inform police leaders in good time allowing them to plan was limited, largely due to the approaches taken by the government in my view, but also due to the constantly changing situation with the pandemic.

“When the government makes an announcement on television, the assumption is that we knew about it, the truth is we didn’t, ...we are just finding out too, or we found out just before, and the impact on demand, we don’t even have time to work it out, and the rules
changing quickly, it has been a challenge, but we are getting there” – Superintendent – Bedfordshire

On the impact on the way of working, police officers indicated that not much had changed regarding their use of information however they now had to respond to information provided to them from new sources such as information about migration and immigration in response to the track and trace service.

Police would be sent information about persons who had travelled into the country and been advised to isolate for a set period if they did not respond to calls to check they were compliant and well. The police would also receive information about persons who had recently entered the country but failed to comply with or respond to any COVID testing requirements.

On one of such calls, it became apparent that the restrictions and requirements created social complexities for many citizens. We went to an address which was clearly a multiple occupancy rental, but the residents insisted they were not individual renters despite denying knowledge of one another at the onset. The individual did however confirm they were confined to their rented room rather than having free run of the home.

In the end, the police officers opted to advise the citizen of concern to simply answer calls from track and trace rather than to launch an investigation into whether the person was isolating in their home which would have been assumed to be a place of domicile occupied by the person alone or with their close family.

I asked about this, and officers indicated that it was of no value to alienate citizens because of the pandemic. They were taking the approach of a light touch preferring to caution and advise individuals, only acting should individuals fail to comply or become antagonistic or hostile.
On another occasion, I attended an address with officers where about 14 men were drinking and revelling at a private address. The officers arrived to find them cramped into a small room in various states of inebriation. They did not make arrests; however, they dispersed the gathering, issued warnings after obtaining details which took some time due to the inebriation of the individuals. The officers and I had to wait there while they all arranged to depart and departed before we could leave.

12.3 The impact of the pandemic

On speaking to other officers, several indicated that the pandemic had reduced acquisitive crimes that were dependent on homes being unoccupied, and in some cases, it was even easier to catch perpetrators of other types of crime such as drug trafficking where it was now harder to get drugs and easier to spot vehicles moving across counties while a restriction was in place.

Most indicated that there was a lull in demand and crime levels immediately after the first national lockdown and the police forces at both sites had used this lull as effectively as they could. They had directed officers to review their wanted persons and warrants backlog and look up all information about persons wanted for crimes or persons who were subject to a warrant for arrest and the officers were tasked with evaluating the information for risk and threat and executing these warrants.

“We were pretty much out there just executing warrants for arrest, before, people could evade us, not be where they were meant to be and so on, but with lockdown, even elusive criminals got scared and went home to their families, so we could go there and the likelihood is we would find them, arrest them, get them processed and clear the backlog” – Constable – Bedfordshire

“It was really busy to begin with but as time wore on and everyone was home, even the persistent criminals were hiding at home too, we had to keep busy, and warrants for recalls
to prison, warrants for arrest that were about to expire, cases that had releases pending investigation with updates, those were our priorities.” – Constable Hertfordshire

In the response teams, the practices also changed based on information known before arrests. Should a person disclose to officers that they might have had contact with or be positive with COVID, then the response staff were required to re-evaluate their necessity test\(^\text{74}\). This would require them to consider means of managing the individual without bringing them into the custody suite. This was not always possible and, in some instances, when observing staff, it was not completely possible to ascertain whether a person might have COVID.

In the custody suite, the impact of the pandemic was evident at both police forces. They had designated some cells for use only by those who were either at high risk of contracting COVID and they had additional questions on booking in to identify potential COVID cases.

At both police forces, the provision for personal protective equipment was very limited. Staff were given gloves, flimsy plastic aprons, sanitisers, work issued masks which were reusable and shared goggles which had to be sanitised after use and reused. As time went on, the availability of these resources diminished until eventually, the only visible protective item was bottles of sanitiser.

While at both police forces, the custody suites would ask for advance notifications on arrivals and police officers had to queue. At Hatfield, there was a holding room inside the custody suite where officers could wait with one-person, other officers waiting to take someone into custody had to wait outside.

At Stevenage, the same provision was available, however the protocol there allowed only one booking in party at a time until the restrictions were eased again.

\(^\text{74}\) A necessity test is a provision of PACE 1984. Police officers are required to meet certain criterion to justify the detention of a citizen in police custody.
At Luton and Kempston custody suites, there was no waiting area. The space at Kempston was a temporary building which had limited space and officers had to wait outside in the carpark until called in. At Luton, officers had to make use of the carpark but also had use of the airlock foyer between the main entry doors and the secondary exit door.

At all four custody suites visited, police officers could not simply let themselves in, the custody suite would give them access following an evaluation of the information officers had and their grounds for detention. In some instances, they might be redirected to the hospital and in others the police medic on site would be asked to evaluate the individual.

The processes of collecting extra information were most useful for the custody staff as they had charge of detainees for longer periods of time. Their most marked difficulties were in reconciling with the limited safety equipment available to them and managing individuals who were distressed or angry to be in police custody.

12.4 Conclusion to the chapter

Overall, the work of policing changed and experienced stresses during the pandemic, due to the different approaches to work and new crimes and legislation. The use of technologies was more important to the police force at the time due to large numbers of staff working from home.

There were changes in the way risk was evaluated using information and the overall organisational decision making with adaptations to accommodate remote working, ameliorate the risks of infection and staff absences. The broader perspectives around the pandemic were of relief, reflected in shared views about having a younger workforce who were less likely to succumb to the serious effects of infection.

The changes to working created wider gaps between senior and junior officers and it was evident that there was fear and concern which the majority of the junior response officers
adapted to with a measure of bravery and determination. Beyond this the value of information systems was tested during this period as the police facilitated a response to newer crimes.

Existing problems with the software systems impacted on response, but overall, the organisations were able to utilise the software to manage backlogs. During the pandemic, although there was a reduction in some forms of high demand crimes, this gave way to an increase in socially led concerns, digitally enabled crimes and difficulties reaching persons who were suffering domestic violence. The police forces compensated for these difficulties by applying a proactive approach to their response to any concerns around domestic violence, social harm and risk or endangerment of life.

Police officers indicated that they also noticed an increase in digital crimes related to virtual currencies, online fraud, online abuse that would escalate to in person conflicts and an increase in domestic violence disclosures through online means. Although crimes were notably not higher than before, the nature changed. Connectivity and interaction was necessary to maintain wellness and support the staff in their work increasing dependency on mobile phones and internet-based tools for video calls and meetings.

Technology supported the police response to new technologies by enabling easier detection of abnormal or irregular movements using automatic number plate recognition (ANPR) cameras and mobile phone tower records. It also provided a means for officers to gain better understanding of digital crimes.
Conclusion of ethnographic insights chapters

The insights gathered at the two police forces demonstratively provided insight into the practice of policing, the work that is carried out and the various streams of work that are involved in the process of operational policing. Conducting research into the business of risk predictions and decision making in policing enabled elicitation of perspectives from and about the policing organisations at Bedfordshire and Hertfordshire and the people (police officers and staff) who do the work of policing recursively and repetitively.

It provided a means for accounting for various phenomena observed as police officers and staff go about their duties carrying out processes that involve routine purposeful communication, interaction and activities between people, their environment, and technologies.

It includes and expresses voices, perceptions, behaviours, and practices as elicited through extensive field immersion involving ethnographic observation and interviews at the participant police forces. It provides insight into police processes, procedures, and the associated enactments around the use of information, information systems and ICTs in the process of conducting risk assessments and decision making in policing at Bedfordshire and Hertfordshire police force.

Although the two police forces differed with Hertfordshire police having a larger area with ten local council areas to cover while Bedfordshire police had three, the cultural practices were very similar as were the perceptions around the value of information, its meaning, and its use.

The insights around day to day working provided detailed understanding of the various communication activities that occur between police officers and staff, and between police officers of all ranks within teams and across the organisations. Both organisations and their staff depended on and understood the essential nature of information and knowledge sharing.
They expressed various creative and rational approaches to acquisition of information. In simplicity the work at the two agencies revolved around and depended on information, its context, and the knowledge and experience of the individuals who would evaluate this to understand and mitigate risk and determine the potential for harm, making iterative decisions as incidents or events evolved or developed.

The feelings expressed in the execution of duties varied with some inclining toward risk aversion precipitated by cumulative effects of scrutiny, challenges to legitimacy and potential fear of blame and reprimand (Home Office, 2008). Other observations exemplified practiced ease with execution of procedures including expressions of thoughtful ways of thinking and doing that were genuinely aligned to a desire to achieve positive outcomes, satisfy policing goals, and uphold the integrity of the policing institution.

This summary observation gave a strong impression that staff were inherently aware of the value, importance, and criticality of the use of information for evaluation of risk and decision making. The observed activities and processes indicated that there are multiple processes, tasks, and duties involved in day-to-day policing. In this way, the insights proved an understanding of the way in which police depend upon, need, and use information to guide activities that protect citizens and prevent harm from crime. Additionally, the insights highlight some various legislative constraints and factors that influence the way information is treated and regarded and how it is used.

Their expressed usage of information systems indicated there is a unique approach to recording and storing information, structured to prevent the use of a large amount of textual information and yet detailed enough to provide the right information to the trained eye. This was an accepted practice, but not without flaws. For instance, limited detail could amount to inadequate or inaccurate information which could impede rather than assist investigations in the present or future.
Observing and inquiring about process of responding to emergencies provided insight into the working life of the average police constable who has regular contact with members of the public. The intricate yet dynamic relationships and interactions between police constables, sergeants and inspectors revealed an ecosystem that is sustained by social relationships and shared ideals and goals.

In their interactions and communications, the various ways in which they interpret, use, transform, transmit and record information and their interactions with technologies demonstratively accounted for individual agency within a bigger picture and toward a common goal, providing understanding of their working practices.

It was also possible to gain insight into the working cultures they might have. It was clear from observations that the working culture of the police often thought of as one that relates to frontline police officers was hierarchical with officers having different cultural affinities that could be clustered with similarities evident at times depending on length of service, role, experience, knowledge, and duties.

Their affects and interactions with one another were generally positive, sometimes boisterous, and overall cooperative. The demeanour of officers when dealing with citizens ranged from patient, to empathetic to longsuffering interspersed with assertive tactics when all patience was exhausted aligned to prevention of crime.

At Hertfordshire where the adoption of the prevention first strategy is driving focus on motivating out of court disposals and improving relationships with the community, officers showed restraint and applied discretionary approaches to crimes which at times might otherwise have resulted in detention or arraignment of citizens. The same behaviour was also noted at Bedfordshire.
Officers at the two police forces recognised and took different approaches to long term information use. Some but not all at both police forces would use the information systems to record or look up intelligence and the most marked use of this was for determination of risk or to plan incident attendance.

The accounting around the police information and communication cycles provide insights that have previously not been accounted for regarding Bedfordshire police and Hertfordshire constabulary. It highlights the interconnectedness of police processes and the interdependencies between various areas of work within the organisations. It provides an understanding of the value of information, communication, and technologies for the facilitation of police work. It also shows how the same is an enabler, providing a means for police to meet modern demands regarding communication and information management.

The close relationship between the two police forces was exemplified in the similarities in ways of working and perspectives about and around information use. The benefits of sharing resources was expressed within the information sharing practices, with some forms of sharing requiring less effort than would be required should they have different systems. The organisations also voiced similar operational work problems around the use of technologies. Their collaborative and cooperative working practices also bore similarity to one another.

There was persistent observed dependence on the police service to respond to medical, social, and random incidents, many of which involved the deployment of police officers to manage incidents that characteristically required the intervention of medics and social care practitioners. This had a mixed impact on officers some of whom expressed their concern about shifting away from fighting crime in the face of public criticisms about the same. For others, it was a precursor to disillusionment with the profession with a potential to motivate staff turnover. In the organisational context, both police forces demonstrated enthusiasm when supporting other services and or collaboratively working with other forces in joint
response. There were clear and organised structures and understandings in place ensuring that their joint response activities were coordinated adequately.

Finally, the effect of the pandemic on policing was multifaceted. It was concerning to see that the police forces were not afforded priority for access to safety equipment and materials, nor were police officers prioritised for vaccinations when the vaccination programs began.

Despite limited access to safety equipment and materials, the police made adaptations, adjustments, and efforts to manage and withstand the changes brought about by the pandemic including changing ways of working and approaches to crime. They changed some of their practices around information system and information use, relying on records of backlogs and intelligence gathered over time to effect arrests and expedite investigations that were delayed.

Responding to new crimes arising as a result of the pandemic legislation, the police forces took an empathetic yet firm view, advising and encouraging citizen compliance above deference to fines and arrests. They also took the demand for management individuals directed to remain in isolation as a result of immigration directives in their stride.

They intensified efforts to act proactively when seeking understanding of and deploying tactics to manage and tackle the salient aspects of serious crimes which became harder to detect during the pandemic demonstrating a measure of resilience and expressed understanding of the value of police intelligence, communication, experience, and police practice.

The next chapter presents findings following application of Checkland’s soft systems methodology to selected problematic situations at the participant organisations.
Chapter 13: Soft systems methodology – analytical findings

“For by these the mind doth turn and convert any impediment whatsoever, to be her aim and purpose. So that what before was the impediment is not the principal object of her working, and that which before was in her way, is now her readiest way”.— Marcus Aurelius: Meditations The fifth Book, Part XVII

This chapter outlines the use of soft systems methodology as an analytical and problem structuring tool. While gathering ethnographic insights, common identified areas of concern identified during iterative thematic analysis was used to stimulate discussions with stakeholders. Le Compte and Goetz (1982) present strong arguments relating to the use of ethnography for facilitation of on-the-spot causal analysis to the exclusion of superfluous factors, however as noted in chapter 3, the insights gained differ from focussed consensus seeking and problem solving. Checkland’s SSM afforded an opportunity to utilise field immersion to stimulate meaningful discussions about problematic concerns. Additionally, insights gathered through ethnographic immersion which included field notes and including activity diagrams became useful tools for characterising purposeful human activities and informing the analytical process. The Finding Out phase of each problem situation was possible due to in tandem facilitation alongside inductive ethnographic analysis. The activity diagrams were useful for understanding the bigger picture, contributing to rich picture production including illustration and segmentation of problematic situations.

In the context of this research, the first wave of iterative thematic analysis of ethnographic insights, involved working with highly unstructured and complex field notes. These field notes were supplementary to activity diagrams/maps which were used to capture individual events and incidents, it was possible to identify some common problems with varied perspectives in this wave and subsequent waves as police officers of all ranks highlighted them.
Much in the same way as ethnography led to the production of “mess” complex and unstructured field notes which were then structured through analysis, SSM was useful for intervening in the unstructured “mess” problems in the human activity systems depicted in the activity maps. In the case of senior police officers, these perspectives involved disclosures of certain problems expressed alongside enquiries regarding what the immersion with junior staff had elicited. In the case of junior officers, information about worries and problems were commonly observed and at times discussed in the course of immersion. It was also possible to engage with senior officers by discussing their positioning and scope to effect change, their ideas about desired improvements or changes and their feelings and perceptions about collective views.

Given the complex multi-sited nature of the research and the well-established hierarchies in police settings, using SSM provided insight into the links between incidents, people, places, and events depicted in activity maps enabling contextual understanding of the location of power and the practices of the individuals within the sociotechnical working environment. It promoted deeper understanding of observed expressions of individual and group agency and the explanations offered regarding challenges that represented problems when responding to crime and community problems. The pluralistic implementation therefore involved interaction – discussion – observation– thematic analysis, - structuring cultural understanding- outline worldviews – structure problem / solution repeat until consensus was reached with all stakeholders. The thematic analysis of ethnographic data focussed on answering research questions and SSM in tandem focussed on the problem structuring/problem solving elements of the research goals.

This was achieved by taking advantage of sustained access to relevant participants at multiple sites and the scope to engage in discussions across various ranks of police officers.

A brief paper highlighting the use of systems thinking approaches in tandem with ethnography in this research was previously presented in a conference submission: Kazeem,
Five problem scenarios are presented in this chapter. The first two outline the three steps of SSM (Finding out, Comparison and Taking action). The first is a problem of information exchange affecting workers in a specialist unit investigating cases of child sexual abuse. The second considers end user problems related to interface and features of the information system.

The last three problematic situations comprise of a brief summary and an illustration of the first step of the SSM process (Finding out). These problematic situations relate to the use technologies in intimate personal violence situations, limited technological scope for management of public disorder and acquisition, sharing and use of information in vulnerable missing persons cases.

13.1 The information exchange process

The problem area detailed in this section was elicited during interactions with the vulnerable adult and children sexual exploitation department. In discussions, concerns about information, its acquisition, sharing, and use were at the forefront. Staff highlighted concerns stemming from making adjustments to improve their record keeping, enhance evidence collection. Others expressed views about their need to ensure they disclose relevant information to local councils to expedite their investigations and support victims in areas outside of police remit.

The concerns centred around sharing information about their investigations to local councils and requesting information about individuals and parties involved. Overall, they found the
The process of information acquisition from local councils was a problem. The four most prominent features of the problem were characteristically related to willingness, timeliness, value, and coordination.

With respect to willingness and timeliness, staff at the police force indicated that they were often stonewalled or met with passivity when requesting information. Additionally, they were not receiving information expeditiously. With respect to value, the concerns raised were around the standards and procedures carried out by third party agencies to mitigate risk and make decisions and veracity of knowledge recorded by third party agencies. Additionally, there were concerns about the process which relies on emails not enabling adequate tracking and monitoring.

While reviewing the insights and considering approaches to the problem, there was a limitation. The local council was not part of this research, and their views and perspectives could not be elicited. To ameliorate this limitation, publications related to the local council’s approach to information sharing with police were consulted.

In the main, the documents revealed that the local authorities in Bedfordshire were aware of the need to share information, but unclear about their tests of integrity and standards. The local council had no clear publicly available document outlining how they manage information related to social care. The local council had no published code of practice or code of ethics related to the acquisition, storage or sharing of information for the purposes of police investigations.

The local council had no clear outline stating contingencies or allocated resourcing within their budget to address and manage information requests from the police. Minutes of published meetings demonstrated that the local council were interested in redirecting responsibilities to the police where possible with respect to supporting and safeguarding aspects that required expenditures on their part. It was also apparent that the local council
had a high turnover of staff in the departments that manage victim support and information management with no dedicated staff to manage police enquiries.

Insights from the force control room and frontline policing were assistive. It was possible to learn from extensive observations in the force control room that vulnerable victims were not provided with support outside of office hours and the local councils would routinely place calls to police just before close of business daily and immediately before weekends and bank holidays to pass on information about high risk vulnerabilities, absolving themselves of the responsibility for victims and leaving the police without access to the local council files or information required to make informed and adequate decisions.

At other times, the nature of the requests and needs of potential vulnerable victims when police would attend incidents were indicatively outside of police remit. In such instances, there was a referral mechanism to enable frontline police to make requests, but the direct contact or on call service at the local councils was limited to an answering service and call backs. The out of hours services were often not open to police and where they were, they did not have capacity to query and or provide information to police to align with the need to make expeditious and informed police decisions.

The comparison to the real world took these concerns and information into account. The focus of the recommendations was police centric. The recommendations considered what was known of the local council’s approach based on observations of the police experience and considered practices which would support the police to deliver effective, efficient, and efficacious services for vulnerable child victims of abuse.
13.1.1 Finding out

Figure 18: A rich image depicting the information exchange situation between the police and local council social care services
Figure 19: An activity diagram showing current information exchange between local council and police
Figure 20: A second activity map showing a different perspective of the current information exchange situation between local council and police
The situation depicted in the rich picture consisted of purposeful activities involving exchange of information. The evaluation considered processes and procedures at other departments and agencies that could be impacted by the processes in the situation. It was decided to limit the realisation of the problem to the one department and the common consensus related to the information exchange process between a third-party agency (the local council) and police investigation officers and staff at the vulnerable adults and children department.

**People affected:** The police organisation, police officers, CPS and Victims

**How things are currently done:** Police request information from the third-party agencies under information sharing policies and agreements. Agencies may supply the information; however, they often do not do so and if they do, they often do not do so in a timely manner and or they exclude information.

### 13.1.1.1 Modelling Stage

The next stage of analysis involved conducting PQR modelling which set out the activity from a practitioner worldview, eliciting CATWOE and root definitions including 3 E analysis and creation of a purposeful activity models using conceptual modelling and value stream mapping/modelling [VSM].

**PQR modelling:** The PQR modelling involved identification of what needs to be done, how it will be done and why it is going to be done. The goal of this was to ensure the process would follow a recursive pattern of enquiring about ‘what, how and why to determine the best fit solution. The problem was evaluated by iteratively gathering perspectives from the police officers where they offered explanations of the problem and potential solutions as illustrated in Figure 21. During these iterations, the common and shared problem was that

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77 The crown prosecution service is the government agency responsible for the arraignment and prosecution of crimes in criminal matters.
the sharing and exchange of information for cases involving sexual abuse was a constraint and the current arrangement was inadequate.

The problem: Police officers acknowledged information sharing agreements exist. From their perspective, the agreements do not translate into adequate compliance by the local councils. Requests for information are not straightforward, seamless, or quick.

![Diagram showing flow of information sharing and problems]

Figure 21: Identifying common problems—deriving consensus

What needs to change (adaptations):

- Working practices and culture at the local councils needs change
- Awareness, and knowledge of what the police use the information for needs change
- Existing process (including technologies) for sharing (currently email requests) needs review and improvement.

Outcome: (P) to devise solutions based on various agreed suggestions that would change current practices and improve the current situation regarding information sharing.
For this problematic situation, the PQR is as follows:

**P:** to identify means for improving the information sharing and exchange process between the police force and third-party agencies and eliminate delays and grey areas when the police request information.

**Q:** to achieve this the needs of the police forces regarding risk decision making will be prioritised, views of those who do the work and those who can influence change will be given precedence and knowledge that informs the process of engaging in successful transformation will be consulted in a recursive process that captures details of and informs definition of problem.

**R:** the process is being carried out to articulate a cost effective/economical way of addressing deficits in information sharing that impede the work of risk decision making and risk assessments which will empower those who do the policing work.

**CATWOE**

Cultural analysis: an outline of the problem, why there is a problem and expectations

**Client Role** – The police officers are experiencing problems receiving information from the local council

**Practitioner** – researcher

**Problem owner:** police officers at the child and vulnerable adult specialist team

**Social system analysis:** identification of power expressions and the social formal and informal roles of those involved.
<table>
<thead>
<tr>
<th><strong>Customer:</strong></th>
<th>police officers at the child and vulnerable adult specialist team</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Actors:</strong></td>
<td>police officers at the child and vulnerable adult specialist team, the local council staff, superintendent for serious and organised crime</td>
</tr>
<tr>
<td><strong>Transformative process</strong></td>
<td>to fix the problematic situations with information exchange and sharing.</td>
</tr>
<tr>
<td><strong>Worldviews</strong></td>
<td>police officers at the child and vulnerable adult specialist team</td>
</tr>
<tr>
<td><strong>Owner</strong></td>
<td>The chief superintendent at the police force</td>
</tr>
<tr>
<td><strong>Environmental constraints</strong></td>
<td>leaders at the local council, funding for the solutions, change resistance, procedural or legislative constraints, limited resources to facilitate the change</td>
</tr>
</tbody>
</table>

**Table 2: CATWOE Analysis for the Information Exchange Problem**

**Root Definition**

The root definition a compressed description of the characteristics that relate to the problem situation and basic aspects of the system to ensure clear visualisation of and clarity around the relationships between execution of activities and the purpose of the execution of such activity/ies.

The root definition for this problematic situation is Police forces require an information sharing mechanisms that is quick and seamless including revision of information sharing arrangements with external agencies with relevant compliance and service level agreements.
**3E analysis**

This analysis considers controlling and monitoring activities related to measuring success of any changes/adaptations on the basis of achieving desired results, using minimal resources and sustainability by, and assessing efficacy, efficiency, and effectiveness of the solutions.

The efficacy measure considers what is to be done to ensure the transformation is being implemented appropriately and how to check whether the solution is working correctly. The efficiency measure considers whether the transformation uses minimal resources and what must be done to ensure sustainability of the transformation. The effectiveness measure considers the longer-term goals of the transformation and how these can be maintained. The 3E analysis for this problematic situation is set out below in Table 3.

<table>
<thead>
<tr>
<th>Proposed solution</th>
<th>Effective</th>
<th>Efficient</th>
<th>Efficacious</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reorganisation/review of information sharing agreements</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
</tr>
<tr>
<td>Effective: evaluate the long-term success by determining if information sharing is quicker and more open</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Efficient: the review will not use many resources or waste resources as it is a productive exercise. It can be controlled by including appropriate decision makers and setting dates within which it must be completed</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Efficacious: Reviewing agreements will enable an evaluation of what exists and what must change, and this should enable a transformation</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Provide training to local council staff for awareness of police child sexual offence specialist team needs</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
</tr>
</tbody>
</table>
Effective: in the long term, training of staff will encourage compliance with police needs and support victims better

Efficient: co-created training will be of value to both parties and will be an acceptable use of resources

Efficacious: training will enable a change over time and transformation will occur.

Address interoperabilities between council information systems and police to enable direct access to data by creating an information request service portal.

Effective: An information request and sharing portal with repository of records will support long term transformation

Efficiency: A portal will be of value to both parties and limit the problems with dependency on emails. It will allow the two agencies to monitor sharing and requests efficiently.

Efficacious: An information request and sharing portal will change the current problem situation and enable better information sharing achieving transformation.

The local council to provide a seconded social worker collocated at police forces to support police emergency response and provide advisory input on a 24-hour basis.

Effective: The colocation of a social worker on police sites will bridge the gaps in knowledge, advise, action, and facilitate quicker responses in the long term

| | Y | Y | Y |
Efficient: The colocation will be of value to both agencies and enable a means of saving expenditure on answering services and administrative wait times.

Efficacious: the colocation impact can be measured by evaluating workflows and processes, if the colocation is carried out carefully, it will achieve transformation.

The local council and police to jointly develop a code of ethics and code of conduct including approved professional practice that takes the police code of ethics and policing principles into account when collecting or requesting information, storing information, evidencing risk decisions and decision making

Effective: The long-term goal of sharing while aware and understanding will be achieved. The long-term goal of requesting while sharing adequately to clarify basis and support police knowledge management will be achieved. This can be monitored by evaluating performance of agreements and gathering perspectives during the change.

Efficient: the activities will be a useful and valuable way of developing closer working practices, understanding and work practices that support the police needs.

Efficacious: The imposition of policies that are monitored and implementation of standards to which there is evident and local accountability will enable a transformation in the ways of working.

Table 3: 3E analysis of solutions for information exchange problems

<table>
<thead>
<tr>
<th>Efficient</th>
<th>Efficacious</th>
<th>Effective</th>
</tr>
</thead>
<tbody>
<tr>
<td>Y</td>
<td>Y</td>
<td>Y</td>
</tr>
</tbody>
</table>
13.1.1.2 Transformation stage

This step involved creating a purposeful activity model to evaluate worldviews and align to continuous improvement by determining what is essential for the transformation highlighted the following:

i. Receptiveness to the recommendation and acceptance by those who have overall control
ii. Availability of funds, staff, services, equipment to complete the transformation
iii. The availability of experts with knowledge and training and the mindsets of the staff
iv. The local council and police understanding of the impact of the changes
v. Outlining the criterion to evaluate the change

Following this, a conceptual model and visual stream model were created. The goal of the conceptual model was to articulate an internal feedback loop that visualises the actors in the human activity system and how they will work through adaptations/changes and an external loop to visualise the input and output of the system modelled and how the activities can be managed. A visual stream map was used to show what was to be transformed, who will do the transforming and who will manage, ensure adequate information, and resource flows relevant to the transformation.

Figure 22: Conceptual image of transformation process for information exchange problem
13.1.2 Comparison

The comparison stage involved improving visualisation and testing of reality by holding the system constructs against the perceptions of the problem (Checkland and Poulter, 2010). This involved initiating discussion and motivating a consensus of varied worldviews by considering real world expression of the conceptual model in order to finalise the conceptual model and advance to recommendations.

At this stage, the intuitive perceptions of the problems based on the elicited accounts of reality were considered alongside the system constructs asserted during the analysis. This involved looking at the real-world situation and comparing the model to the perceived situation acknowledging and accommodating different views as shown in Table 4.

<table>
<thead>
<tr>
<th>Conceptual model activity</th>
<th>Real world</th>
<th>Actions that can be taken/Recommendations</th>
</tr>
</thead>
<tbody>
<tr>
<td>information request portal</td>
<td>The information systems that police use and that of the local councils serve different purposes. It is problematic to connect them up, however staff need to be able to request and receive information and log the requests and receipt effectively and monitor response times</td>
<td>Participatory design of information sharing portal with staff from the police and councils and costs borne by local councils.</td>
</tr>
<tr>
<td>Dedicated officer in local council to service</td>
<td>There are no dedicated officers to serve and provide information to the police. The</td>
<td>Policy changes to set timescales for responding to requests from the</td>
</tr>
<tr>
<td><strong>information to police in vulnerable adults and children department</strong></td>
<td>local council may not be able to afford a dedicated officer via service level agreement.</td>
<td>vulnerable adults and children team</td>
</tr>
<tr>
<td>---</td>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td><strong>3-day window to comply with requests for information relevant to child sexual abuse cases</strong></td>
<td>The local council may operate a standard time frame for requests for information and not have provision for specific timescales/</td>
<td>Service level agreement to include timelines for Information required to facilitate investigations involving sexual abuse of children proposed by police with advice from crown prosecution service.</td>
</tr>
<tr>
<td><strong>Staff training about child abuse and the national strategic requirement</strong></td>
<td>Training local council staff receive may not give them adequate details to encourage them to share information. Staff and local council organisation may be afraid of reprisals and reprimands if they share information that reveals their inadequacies or failures.</td>
<td>Design of guidance and training by police OR approved by police to inform local councils’ staff of the need to record details and the importance of expeditious disclosure of full ratified details of their involvements and interventions regarding victims of sexual abuse.</td>
</tr>
</tbody>
</table>

Training to include information about the management of police information and highlight the problems that occur in
<table>
<thead>
<tr>
<th><strong>Reinforcing adherence to information sharing in the context of requests from local council to police forces</strong></th>
<th>Local council practices may be driven by their working practices, cultures, and expectations, hindering change.</th>
<th>Service level agreement to incorporate what police forces expect from local councils, highlighting the importance of providing adequate basis for sharing to improve police knowledge base and support MOPI compliance.</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Training council staff</strong></td>
<td>Local council staff may be unaware and or unfamiliar with the national strategic requirements.</td>
<td>Design of guidance and training by police / approved by police and a Service level agreement proposal to highlight compliance with the national strategic requirement for policing with respect to sexual exploitation and abuse of children.</td>
</tr>
<tr>
<td><strong>Local council staff offered training</strong></td>
<td>Local council staff may be indifferent or unaware of impact of their delays to</td>
<td>The local council staff will be encouraged to deliver information expeditiously.</td>
</tr>
<tr>
<td>Social worker collocated on police premises</td>
<td>Local council may be unable or unwilling to fund staff and locate them at police sites. Social workers may bring practices from their workplaces which impede investigations</td>
<td>Police provide a cost-risk-value evaluation to enable local council to make informed decisions to provide and fund collocated staff. Police forces to enable and support access to training aligned to police codes of ethics and approved professional practice for staff who are provided to police.</td>
</tr>
<tr>
<td>---</td>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td>Creation of code of practice, code of ethics and approved practices by a body specifically created to hold social workers</td>
<td>Social workers are currently required to register with a Country specific regulator who monitor fitness to practice and set out professional standards for social workers. The regulator may encounter resistance and</td>
<td>A consultation between country regulators, police regulators and local councils to enable the structuring of commonly agreed ethics that adhere to the same standards regarding ethics, accountability, and practice.</td>
</tr>
</tbody>
</table>
13.1.3 Taking action

Recommendations

Overall, the recommendations reflect common suggestions from insights gathered about potential solutions from the police perspective.

1. Child abuse police department to propose updates/iterations to information sharing agreement
   - To include an outline of explanations regarding criticality of specific information requests and service level agreements that local councils should meet to meet overall goals of jointly preventing harm and risk to victims.

2. The local council and the police to initially propose and agree changes to set timescales for responding to requests from the vulnerable adults and children team within three days of such requests.
   - This agreement to be set out in an information sharing service level agreement.
   - The service level agreement proposal should highlight the requirements for compliance with the national strategic requirement for policing with respect to sexual exploitation and abuse of children.
   - The Service level agreement should include clear timelines from request to exchange of information required to facilitate investigations involving sexual abuse of children.
   - The timelines should be proposed by police with advice from crown prosecution service in consultation with the local council.
• The Service level agreement should include clear agreed guidance and rational for adherence to principles and policies around sharing information request basis to support and improve police knowledge base and practices when local councils make information requests.

3. Local councils to engage with police to design guidance and training with input from police or approved by police.

• The training material should include learning content that explains national police strategic requirements
• The training material should include learning content that clarifies information that is of value to the crown prosecution service demands
• The training material should include learning content that clarifies the dependencies of police on information sharing from the local council
• The training material should include learning content that explains the value and importance of expeditious disclosure of full ratified details of local council involvements and interventions regarding victims of sexual abuse.
• The training material include information that outlines the fundamental basis of management of police information.
• The training material to highlight the problems that occur in investigations and prosecution when police are unable to maintain adequate and prompt records and information related to cases of sexual exploitation and abuse of children.

4. Local councils to engage with police to develop locally and regionally monitored codes of conduct, standards, and requirements for recording information about vulnerable individuals aligned with policing standards which the councils’ staff must adhere to.

• The local council to be accountable to the local police and crimes commissioner regarding the adherence to these codes, standards, and requirements.
• A participatory design focus group including local council staff and police to enable design of an adequate information request and tracking portal
• The focus group to be facilitated by a practitioner who is able to elicit worldviews from the responsible local council staff and enable police and local councils
5. An information sharing portal funded by the local council for local council use be created using existing resources within the local council

- To remedy the lack interoperabilities between council information systems and police systems
- To enable direct access to data through an information sharing portal for the long term
- Access to this portal to be provided to relevant police officers and departments for referrals, requests for information to the council
- The portal to serve as a repository of information supplied or withheld

6. Local councils to facilitate and fund the provision of social worker to be located on police sites and available to provide advice and support in operational response settings 24 hours a day for the following purposes:

- To provide efficient and efficacious access to information held by local councils
- To expedite interventions that are dependent on local council input
- To advise and support police response and investigations
- Police forces to enable and support access to training aligned to police codes of ethics and approved professional practice for staff who are provided to police
- Police provide a cost-risk-value evaluation related to colocation of staff to enable local council to make informed decisions to provide and fund collocated staff.

7. The police and local council to discuss and motivate co-ownership of the problems that impact on legitimacy and are shared between the local council and police.

- To encourage and support expeditious delivery of information to police
- To ensure success of colocation agreements
- To ensure collocated workers comply with police code of ethics and understand approved practices

The problem with information exchange was highlighted by the child sexual abuse team who work on cases involving child sexual abuse. The victims they encounter are vulnerable children who may already be known to social care departments at local authorities.
In many cases, children who are victims of sexual abuse are first known to the local councils and their interactions with these agencies may lead to a range of interventions with medical staff, social work staff and other non-governmental agencies. It may also include therapies and support. Each individual a person who is a victim has contact with will likely have information that they will share and feed to social services teams routinely.

Sharing this information with the police is a relevant way for social work departments to give an account of their interventions and records. It should help them to share disclosures made to them and provide a means for police to gain insight into the lived experiences of the victim. Social work departments could be asked to make statements and could be called upon to give evidence where necessary. They should also be able to provide an account that enables police to ensure the victim is receiving the support they need. Overall, the disclosures if timely and forthcoming should support appropriate police record keeping, investigations and case building.

Additionally, the processes, activities, contact, and records held by social work departments should be subject to the same or similar codes of conduct and these departments should be aware of the importance of the quality of their information and the legal ramifications of maintaining proper records. Their work should be aligned to policing principles and they should also be highly aware of the implications and effects of their practices on police integrity and legitimacy.

13.2 Information systems features and end user experiences

The problem outlined in this section is a global operational policing problem, affecting the staff and police officers and police staff concerned with operational policing and the delivery of frontline services day to day (force control rooms, police response, police custody and specialist investigations departments).
The elicitations were made during observation, discussions, and interviews over a 3-year period at both police forces. The issues highlighted were related to the Athena information system which was rolled out in 2018. It is used by Bedfordshire and Hertfordshire police for case management, custody management, intelligence management, human resources, and reporting. In addition, the two police forces at which the problems were elicited are part of a 7-force collaboration wherein, all the agencies are on a buy in program which includes the use of Athena software service. Each police force that participated in this research raised and highlighted similar concerns.

Several concerns were raised by staff of all ranks and the importance and relevance of these issues were considered during ethnographic analysis. The problems arising from the situations fell into two categories, having either a direct impact on specific areas of work and or a consequential impact on police processes and the police organisations. Overall, these problems were linked to ease of use and functionality (from a policing perspective, and in consideration of the benefits advertised by the software service provider)

All the concerns and problems raised representatively impact on organisational memory, impede information sharing and interoperability with other police forces. This in turn affected staff morale, increasing time spent carrying out administrative tasks significantly, extending to staff retention problems. At an organisational level, the problems represent obstacles that prevent maximisation of funds, realisation of benefits from the software/cost benefits, overall efficacy of operational policing, autonomy when developing digital capabilities and cumulative risk management.

The problems that were elicited summarised have some historical elements characterised by rapid bureaucratic changes at a national level, complicated by the nature of the policing organisations, the collaborations between several organisations and procurements arrangements. Most of the staff confirmed that the problems with connectivity and ease of
use have been present since the onset of adoption. The complications were elicited in discussions with police leaders, and these are related to the placement of power to effect a change or demand improvement of the software which was further complicated because the systems are shared with a larger group of police forces.

Figure 23: The communication chains linked to the information system
This initially gave the indication that it might be difficult to address the problems given contractual arrangements, collaborations, and shared systems. However, it was evident from insights that the complicatedness of moving into collaborative agreements, particularly the adoption of the Athena system was initially taken on with limited exploration and understanding of all the issues it might raise. Importantly, all the police forces within the collaborative agreement could be said to have the same continuing situations requiring them to continuously invest more and more into manpower, resources, expert problem solving to realise benefits from the software.

Given the newer collaborative agreements which include other police forces besides Bedfordshire, Hertfordshire, and Cambridgeshire (who had an initial Triforce arrangement with respect to the software buy in), the continued use of the software has been accepted as a better choice than no software and no instruments in place to satisfy statutory requirements.
In view of this, publicly available historical information regarding Athena and its advent as an operational policing tool was reviewed. Additionally, information about the police forces use of Athena was also reviewed. This informed iterative discussions about the problems and structuring of solutions.

The Athena information system runs on a platform called Connect® which enables data transmission and exchange with court services and the crown prosecution services. It should in practice enable the police forces to record, prepare and manage cases, record, and mange custody intakes, record local intelligence and manage investigation records. Police officers access this system either through a mobile interface using the Tuserv mobile app (often preferred and used by for specialist investigation teams) and through a desktop or laptop (commonly used by custody suites and response departments).

A review of publicity documents from NEC Software Solutions (formerly Northgate), the company responsible for the delivery of Athena highlighted a ten-year renewable contract and shared costs between any police force that takes up the software and those who already use the software.

The description of the renewable contract implies there is exit opportunity, but this was shrouded by existing policies for acquisitions by police forces and scope for negotiation by police forces. Police forces who buy into the software cannot simply exit the arrangement without another option and their exit would then complicate their arrangements to share information with the other police forces. Additionally, police forces would need to show compelling evidence to stop using the systems and exhibit lean, efficient practices when considering whether to retain or discard use of the software.

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76 Connect is a police record management platform that enables the transmission of case records and custody records and information with the crown prosecution service and court systems.
The company’s marketing material for Athena asserts that the software enables joined up information supporting management of policing guidance (MoPI\(^{62}\)). Their documentation states that Athena includes workflows that are structured around police processes and activities enabling best practices with respect to victim support, threat and harm prevention and duty of care to staff.

The outline from NEC also asserts that Athena harnesses common business processes to support streamlined transfer and sharing of information with the crown prosecution service, the courts service, prison services, probation services and other criminal justice system partners. This includes access to real time analysis of operational, performance and intelligence data. It implies that it offers cost reductions for police leaders in operational policing including improved and timely access to information.

The provider asserts the software reduces bureaucracy and ensures compliance with legislation and codes of practice. It also advertises quick and seamless access to information from handheld devices for frontline officers to support quick decision making. It highlights the capability of the software to enable faster and easier custody management, seamless detainee processing and flagging of wanted persons and processing of detainees from other police forces.

Understanding the situations that gave rise to the problems at hand centred upon understanding this history and the known organisational situation as detailed in the ethnographic insights. It was also beneficial to see and experience the implications of the problems for the police officers and police organisations.

\(^{62}\) MOPI is a statutory code of practice on management of information. It provides police with a framework that sets out a common standard regarding how police should collect, record, evaluate information. It includes guidance on how to review the actions they take regarding information.
13.2.1 Finding out

Problematic situation includes, Interoperability, connectivity, Ease of use, Availability, functionality, adaptability etc. Problem affects all workers who use the system and all organisational subsystems that depend on the output and input to the software service.

Figure 25: A rich image depicting the real-world setting including the problematic situation
The situation depicted in the rich pictures included several interdependent work streams with a common problem. An important component of work in Response, Custody, Tactical and Specialist departments involves the shared and collaborative use of Athena software. All the departments had common problems related to ease of use, availability and functionality of Athena and its efficient interoperability with other police and criminal justice systems.

People affected: The police organisation, police officers

How things are currently done: The police forces have one single IT department shared with 7 other police forces. Their IT needs are fulfilled in line with their funding capability. The Athena information system is currently licenced to the police as a service. The services and capabilities are funded by the police forces. The problematic situation involved the following issues.
1. Police staff are sometimes informed of outages; however, the software provider has no provision for offline working to prevent service disruption.

2. Requests for feature changes are currently logged and filed by NEC the software provider.

3. The provider does not currently make expeditious changes to the software to incorporate changes and needs, rather, it advises workarounds for the current system which often involve fragmented practices.

4. Police forces use the Connect platform supplied by the makers of Athena to connect and send data to the crown prosecution service and other criminal justice agencies.

5. Athena has no interoperability with the police national database or computer which causes conflicts when managing bail conditions under new legislation.

6. The police forces are limited in their collective negotiating power with the software company regarding access to the Athena application programming interface, development of interoperabilities and realisation of promises and or deliverables highlighted in its marketing.

7. The capabilities and features advertised by the providers of the Athena software service, particularly those related to efficiency and efficacy inclined toward deficits when the overall picture of the situation is considered based on elicited perspectives.

**Problem map**

<table>
<thead>
<tr>
<th>Insight strand</th>
<th>Impact on staff</th>
<th>Impact on organisation</th>
<th>Class</th>
</tr>
</thead>
<tbody>
<tr>
<td>Network outage due to software crash</td>
<td>interruption, delay,</td>
<td>Manhours lost, reduced</td>
<td>Functional</td>
</tr>
<tr>
<td></td>
<td>loss of data</td>
<td>availability to respond, reduced police demand</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>capacity, delayed investigations</td>
<td></td>
</tr>
<tr>
<td>Network outage due to software updates</td>
<td>Induce avoidance practices</td>
<td>Low data quality, backlogs</td>
<td>Functional</td>
</tr>
</tbody>
</table>

350
<table>
<thead>
<tr>
<th>User interface difficult to use</th>
<th>Slow progress, backlogs, errors, staff working outside hours</th>
<th>Manhours loss, low data quality, lost revenue, increased risk of avoidance practices</th>
<th>Ease of Use, Functional</th>
</tr>
</thead>
<tbody>
<tr>
<td>System lacks prompts that enable/motivate workflow</td>
<td>Reduced morale, reduced motivation</td>
<td>Increased staff turnover, lost training investments, welfare concerns</td>
<td>Ease of use, functional</td>
</tr>
<tr>
<td>Workers cannot collaborate on a single case</td>
<td>Staff indirectly abstracted for case building, staff working outside hours</td>
<td>Manhours loss, reduced performance, reduced police demand capacity, delays to investigations</td>
<td>Ease of use, functional</td>
</tr>
<tr>
<td>Cases in progress are not backed up or saved prior to outages</td>
<td>Workers are demoralised, workers cannot achieve risk prevention goals</td>
<td>Cumulative problems with risk management, diminished operational capacity, reduced police demand capacity, delays to interviewing detainees</td>
<td>Functional</td>
</tr>
<tr>
<td>Layering of information and intelligence difficult to access</td>
<td>Staff unable to / reluctant to use intelligence base</td>
<td>Direct impact on organisational knowledge and memory, working risks due to segmented data</td>
<td>Ease of Use, Functional</td>
</tr>
<tr>
<td>Data sharing is not seamless or problem free</td>
<td>Limited access to shared data, knowledge, and intelligence</td>
<td>Limited realisation of benefits of software, lost revenue, organisational memory</td>
<td>Functional</td>
</tr>
<tr>
<td>Limited integration with police national computer (PNC)</td>
<td>Double tasking to manage PNC matters</td>
<td>Loss of revenue, compliance problems, Lost manhours</td>
<td>Functional</td>
</tr>
<tr>
<td>Bail to return does not allow bail to an unspecified date</td>
<td>Backlog of manual adjustments, increased manhours</td>
<td>Lost manhours, problems with errors and omissions, missed prosecution opportunities</td>
<td>Functional</td>
</tr>
<tr>
<td>System does not include a section that allows entry of disclosure vulnerability markers in custody</td>
<td>Workers use workarounds which involve use of word processing templates</td>
<td>Compliance problems, loss of revenue</td>
<td>Functional</td>
</tr>
<tr>
<td>Software links to Tuserv are difficult to use</td>
<td>Reduced uptake of Tuserv</td>
<td>Loss of revenue, compliance problems, failure with embedding use</td>
<td>Functional</td>
</tr>
<tr>
<td>Links to Connect to enable court service</td>
<td>Staff spend many hours compiling and sharing documents</td>
<td>Loss of revenue, limited realisation of software</td>
<td>Functional</td>
</tr>
<tr>
<td>Issue</td>
<td>Impact</td>
<td>Category</td>
<td></td>
</tr>
<tr>
<td>----------------------------------------------------------------------</td>
<td>------------------------------------------------------------------------</td>
<td>--------------</td>
<td></td>
</tr>
<tr>
<td>and CPS are complicated and slow</td>
<td>benefits, delayed decisions from CPS</td>
<td>Functional</td>
<td></td>
</tr>
<tr>
<td>System is slow and cumbersome</td>
<td>Hours lost doing admin, staff demoralised</td>
<td>Functional</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Manhours lost, reduced operational performance, reduced police demand capacity</td>
<td>Functional</td>
<td></td>
</tr>
<tr>
<td>No interoperability with STORM</td>
<td>Staff must move between systems to complete work</td>
<td>Functional</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Operational data is not streamlined. Organisational memory impacts</td>
<td>Functional</td>
<td></td>
</tr>
<tr>
<td>Not compatible with Aspire</td>
<td>Staff have to manually extract details to Aspire</td>
<td>Functional</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Operational data is not streamlined. Organisational memory impacts</td>
<td>Functional</td>
<td></td>
</tr>
<tr>
<td>Not interoperable with Niche</td>
<td>Staff cannot easily access or intelligence outside of the police forces who share the same system</td>
<td>Functional</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Sharing is limited to organisations who use the software. Overall aim of global sharing is not achieved. Compliance problems, loss of revenue</td>
<td>Functional</td>
<td></td>
</tr>
<tr>
<td>Limited interoperability with crime reporting</td>
<td>Slowed working, loss of morale</td>
<td>Functional</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Compliance problems, loss of revenue</td>
<td>Functional</td>
<td></td>
</tr>
</tbody>
</table>
13.2.1.1 Modelling stage

Setting out the activity from a practitioner worldview, eliciting CATWOE and root definitions including 3 E analysis and creation of a purposeful activity models using conceptual modelling and value stream mapping/modelling [VSM].

PQR evaluation what could be done relative to the problem.

Figure 27: PQR analysis of the information systems problem

The collective perspective selected was that of servicing efficient, effective, fair, and adequate service delivery to the police forces. All workers agreed that the difficulties with Athena software need to be addressed.
Views about the impact of the various problems and potential solutions were gathered. As this was a complex situation with many shared problems about one single entity, the first planned action was to create a problem map and select solutions with a consensus.

The end goal was to structure solutions resolve immediate problems which had an impact on operational policing and to outline solutions that would enable a comprehensive change in the relationship between the software provider and the police. This could motivate the development of wider procurement and service provider policies that align to the principles of ICT for good and support the continued development of systems that enable compliance with national requirements regarding local information technologies and information systems for police forces.

**CATWOE**

Cultural analysis involves an outline of the problem, why there is a problem and expectations

**Client Role** – The police officers are experiencing problems with connectivity, availability, and ease of use of Athena information system

**Practitioner** – researcher

**Problem owner:** police officers at the two police forces & police forces who share the same information systems.

**Expectation:** Police officers and organisations require systems that are reliable, fit for purpose, cost effective.

**Social system analysis:** identification of power expressions and the social formal and informal roles of those involved. Roles (social positions that mark differences between members of the organization including informal roles.

Police constables – respond to incidents, log reports, prepare case files
Custody staff – book in detainees, liaise with the courts service, secure and transport detainees

Police staff (control room) – create and file cases that are intelligence based and cases that require no police attendance, also look up data on Athena to ameliorate response risk.

Supervisory staff – use Athena for work provisioning and staff resourcing, use Athena to track case reviews, look up and add cases and intelligence.

Specialist departments – Use Athena for intelligence and case management, use Tuserv to connect to Athena to build cases for CPS.

Police leaders – support and direct staff on case management, case progress and management of response and operational demand.

NEC – responsible for the delivery of the Athena software service

Home office – have input and some control over funding for digital capabilities

Police digital service – involved in supporting digital transformation and capabilities at the police forces.

Values: crime risk and harm reduction, compliance with legislation, national policing policies and approved professional practices, policing plans and policies aligned to communities, key performance indicators aligned with inspectorate requirements.

Analysis 3 – Political Systems Analysis

(How is power expressed, where is the power)

The ultimate power to prevent changes or transformation lies with the chief superintendents of the police forces.
<table>
<thead>
<tr>
<th><strong>Customer:</strong></th>
<th>police officers at the 7 police forces</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Actors:</strong></td>
<td>police officers at the 7 police forces, police leaders at the 7 police forces, the home office, the police digital service, NEC the provider of Athena services.</td>
</tr>
<tr>
<td><strong>Transformative process</strong></td>
<td>to fix the problems with Athena services.</td>
</tr>
<tr>
<td><strong>Worldviews</strong></td>
<td>police officers at police forces</td>
</tr>
<tr>
<td><strong>Owner</strong></td>
<td>The chief superintendent at the police forces</td>
</tr>
<tr>
<td><strong>Environmental constraints</strong></td>
<td>Leaders at the police forces whose views were not elicited, NEC the software owner, cost of the solutions, contractual procedural and legislative constraints, managing changes, resources needed to manage the period of transition to change.</td>
</tr>
</tbody>
</table>

*Table 6: CATWOE analysis for information systems problems*

**Root definition**

The police forces case and intelligence management information system to have good interoperability, good connectivity and availability aligned to the rigors and demands of police work enabling staff to complete their duties efficaciously.
**3E analysis**

Evaluation of the transformation (recommendations) to determine whether the chosen means achieves desired result, uses minimum resources, and achieves long term aims. A measure of effectiveness, efficiency, and efficaciousness.

<table>
<thead>
<tr>
<th>Proposed solution</th>
<th>Effective</th>
<th>Efficient</th>
<th>Efficacious</th>
</tr>
</thead>
<tbody>
<tr>
<td>Review of connectivity issues</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
</tr>
<tr>
<td>Effective: Agreeing a timescale to remedy connectivity issues will be an adequate long-term solution</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Efficient: compelling NEC to demonstrate capacity to provide infrastructure to enable offline working if outages occur will be a means of ensuring police derive the efficiency the service is to deliver</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Efficacious: satisfying the provision for offline working and meeting the short timescale to remedy connectivity and availability concerns with the software service will enable a transformation.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Review of the service level agreements provided by NEC</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
</tr>
<tr>
<td>Effective: Reviewing agreements</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
in line with police needs and the pace of innovation will enable long term efficiency of the software service delivery.

Efficient: reviewing agreements will enable the two parties to negotiate and build more value into the agreements over time using police resources effectively.

Efficacious: Timed reviews of service level agreements are aligned with fair delivery of software as a service enabling transformation.

Police forces to enable an internal oversight team to log and collate outage and software useability concerns.

Effective: in the long term, police operational staff in lower ranks will be encouraged to share and co-own problems.

Efficient: The solution will enable an internal mechanism provides the police force with valuable internal logs which provide a means of evaluating loss of revenue and user needs.

Efficacious: The solution will work and can be monitored and should achieve positive change and transformation.
Police forces and NEC to establish an independent ethics committee to evaluate the use of information systems services.

Effective: The independent ethics committee will enable the police to maintain oversight regarding use of information and enable NEC to better meets its responsibilities to the police by developing better input systems.

Efficient: The independent ethics committee will support police toward legitimacy and improve understanding of critical information issues.

Efficacious: Enabling critical information oversight will support transformation by improving accountability and legitimacy.

| Independent review to determine and measure where possible the cost implications and impact of software failures at cost to the software provider. | Y | Y | Y |

Effective: An independent review will enable clarity for police forces and provide them information they need to compel changes with the current service delivery with NEC.
Efficiency: the investment in an independent review will be a fair and open means of breaching the problematic situations.

Efficacy: the review should provide insights that support transformation.

Review of regional standards and recommended practices for the provision of information systems and information technologies to police

Effective: by compelling NEC to engage with IT department at the 7 forces to structure a standards document aligned with public sector standards and recommended practices for the provision of information systems and information technology services to police forces, long term goals that police should realise from the software service will be achieved.

Efficient: Development of standards will be a worthwhile task enabling and ensuring that police needs are met.

Efficacious: Setting or resetting standards will enable a change in the way that the provider perceives the police and support understanding of the criticality of the service they provide.
<table>
<thead>
<tr>
<th>Review of the contract for the Athena service to negotiate changes</th>
<th>Y</th>
<th>Y</th>
<th>Y</th>
</tr>
</thead>
<tbody>
<tr>
<td>Effective: negotiating the Buy to own contracts and the service contracts to include release of the Athena system API to police forces who buy into the service will enable police to develop their capabilities and draw maximised benefit from the software service</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Efficient: The review of the contracts to achieve a meaningful solution for police forces will be an adequate use of resources and time.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Efficacious: achieving the positive review of these crucial needs will improve long term cost benefit realisation and improve police service delivery achieving transformation</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Requisitioning NEC to provide a roadmap for improvement of user interface and software functionalities.</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
</tr>
<tr>
<td>Effective: the overall software service user base will benefit from the improvement of the functionality and interface in the long term</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Efficient: The requisition is a rational demand aligned to proper use of police resources as they are paying for a service.</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Efficacy: A roadmap and eventual changes to the interface and functionalities to meet police needs can be monitored and should achieve a transformation of police staff and officer morale, improving processes and administrative duties.

Table 7: 3E analysis of the solutions for information systems problems

<table>
<thead>
<tr>
<th>13.2.1.2 Transformation stage</th>
</tr>
</thead>
</table>

This step involved creating a purposeful activity model to evaluate worldviews and align to continuous improvement focussed on determining what is essential for the transformation highlighted the following:

**Considerations**

3. Receptiveness to the recommendation and acceptance by those who have overall control
4. Cost of the transformation including staff and resources.
5. The availability of experts with knowledge and training
6. Change resistance management
7. The police and other actors understanding of the impact of the changes
8. The influence of external actors who have significant influence
9. Developing the criterion to evaluate the change

**Next step:** Creation of conceptual model and visual stream model. The goal of the conceptual model was to articulate an internal feedback loop that visualises the actors in the human activity system and how they will work through adaptations/changes and an external loop to visualise the input and output of the system modelled and how the activities can be managed. A visual stream map was used to show what was to be transformed, who will do the transforming and who will manage, ensure adequate information, and resource flows relevant to the transformation.
Purposeful activity model

Following completion of the purposeful human activity model conceptual modelling and visual stream mapping were carried out. The conceptual model enabled visualisation of internal feedback loops to the human activity systems related to the problems with Athena and external feedback loops that visualise the input from potential solutions and outputs as a result of implementation to the system model. This enabled an assessment of the activities that feedback into the loop.

Visual stream mapping\textsuperscript{33} was used to outline, analyse, and review the proposed recommendations to improve the value of the recommendations, minimise waste and

\textsuperscript{33} VSM is a lean management tool used to promote documentation, analysis, improvement and flow of resources, information and materials required to deliver services to a customer. It allows the customer to see the flow of information as services are delivered through the value stream. It also enables the implementation of quality control measures and evaluation of efficiency, efficacy, and value in practice.
promote continued enhancement. Together they stimulated evaluation of the issues that could affect the success of transformation and support continued improvement.

13.2.2 Comparison

During the comparison stage the real-world situation was recursively examined in relation to the model of the perceived situation including accommodation of different views. This stage took the historical and reviewed documentary information into account alongside elicited views of reality and system constructs from the analysis. A problem map was created to categorise the problems.

<table>
<thead>
<tr>
<th>Conceptual model activity</th>
<th>Real world</th>
<th>Actions that can be taken/Recommendations</th>
</tr>
</thead>
<tbody>
<tr>
<td>Independent review to determine and measure cost implications and impact of software failures to police forces at cost to the software provider.</td>
<td>The police forces who use the systems may have more problems that are revealed by an independent review. The company and police may be averse to this due to cost, time investment and implications of findings.</td>
<td>A review that includes all the police forces using the Athena system will enable evaluation of the cost implications of failures for the police forces. An independent review will eliminate the potential for prejudicial analysis. The police forces have leverage due to historical accounting of the issues which supports passing the cost to the service provider</td>
</tr>
<tr>
<td>Immediate Review of software availability issues and agreement of a timescale to remedy these.</td>
<td>There are no established routes for investigating software availability that is open for junior officers to contribute their concerns, so that they feel heard, engage as co-owners of the problems, and contribute to the solutions.</td>
<td>NEC is encouraged to enter an obligation to respond with actions that correspond with cessation of the software availability concerns.</td>
</tr>
<tr>
<td>---</td>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td>Review of the service level agreements provided by NEC</td>
<td>The review of the agreements may reveal terms that are not aligned with the 24-hour police demand model. NEC and other police forces may not agree with the review.</td>
<td>Anomalies and failures of service level agreements can be identified, and amendments can be agreed.</td>
</tr>
<tr>
<td>NEC to develop and deliver infrastructure to enable offline working</td>
<td>NEC may argue that its platform is based on cloud services, the police computers and laptops may need extra</td>
<td>The provider of the service led Athena software will be aligned to policing standards for service delivery. The cost of offline working if police need improved computers is likely to be</td>
</tr>
<tr>
<td><strong>working if outages occur</strong></td>
<td>capabilities for offline working</td>
<td>more favourable than losses due to inability to work and respond to crime or difficulties meeting legal requirements.</td>
</tr>
<tr>
<td>---</td>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td><strong>Review of regional standards and recommended practices for the provision of information systems and information technologies to police</strong></td>
<td>The software company may be reluctant to change ways of working.</td>
<td>The 7 police forces will be in a position to pioneer standards as a blueprint for information system development and provision to police forces. Police forces will have empowerment to assert their needs and prevent unfair or complex service delivery terms.</td>
</tr>
<tr>
<td><strong>Subsidised sale or lease of Athena system API to police forces who buy into the service to enable them to develop their capabilities</strong></td>
<td>The provider may consider its API to be its key service marketable entity and fear losing continued revenue should it release it.</td>
<td>API elements which do not cause commercial detriment to be considered. Agreements on use and exploitation of the API would be supported by the provider.</td>
</tr>
<tr>
<td><strong>Requisitioning NEC to provide a roadmap for improvement of user interface and</strong></td>
<td>The provider may argue it is not obligated to provide an improvement roadmap.</td>
<td>Provision of a roadmap will support development of digital capabilities and preparedness. Awareness will enable</td>
</tr>
<tr>
<td>Software functionalities.</td>
<td>Concerns should radically changes to functionalities and interface require more training costs.</td>
<td>Police forces to have more say in how software is developed.</td>
</tr>
<tr>
<td>--------------------------</td>
<td>-------------------------------------------------------------------------------------------------</td>
<td>----------------------------------------------------------</td>
</tr>
<tr>
<td><strong>Police forces to enable an internal oversight team to log and collate outage and software useability concerns</strong></td>
<td>There are no established routes for investigating software availability that is open for junior officers to contribute their concerns, so that they feel heard, engage as co-owners of the problems, and contribute to the solutions.</td>
<td>Enables police forces to enumerate impact on demand and costs on an ongoing basis. Provides a means of engaging with junior workers to include them and improve morale.</td>
</tr>
<tr>
<td><strong>Police forces and NEC to establish an independent ethics committee to evaluate the use of information systems services</strong></td>
<td>The police forces may feel that compliance with MoPI is adequate, NEC may not wish to have independent evaluation of its software</td>
<td>The police can practice oversight of the software provided to them. The provider can ameliorate ethical concerns.</td>
</tr>
</tbody>
</table>

*Table 8: The comparison table— information systems problems*
13.2.3 Taking action

Recommendations

1. An immediate review of known and reported software concerns with a view to compelling the software service provider to fix them
   • A comprehensive summary of issues to be produced
   • Provider to enumerate a timescale to remedy the problems in the short term
   • Provider to outline timescale for long term management
   • Staff inclusion and co ownership of problems without penalty
   • NEC is encouraged to enter an obligation to respond with actions that correspond with cessation of the software availability concerns

2. Independent review to determine and measure cost implications and impact of software failures to police forces at cost to the software provider.
   • Enables identification of problems all police forces who use the systems have more
   • The cost to be borne by the service provider
   • The police forces to cooperate with the review
   • Enables evaluation and outlining of the cost implications of failures for all the police forces using the Athena system
   • The independent review will eliminate the potential for prejudicial analysis

3. The police forces have leverage due to historical accounting of the issues which supports passing the cost to the service provider
   • Review of the service level agreements provided by NEC
   • The review of the agreements to ensure terms align with the 24-hour police demand model.
   • Identification of anomalies and failures of service level agreements
   • Amendments commensurate to issues identified

4. NEC to develop and deliver infrastructure to enable offline working if outages occur
   • Enable continuity of business for police forces
   • Prevent loss of revenue, manhours due to unavailability of Athena
   • Drive change in the way service software is delivered to the region
   • Align service provided to policing standards for service delivery.
   • Remove risk of increased crime and harm risk due to lengthy indirect abstractions for administrative duties.
   • Improve working conditions
5. Review of regional standards and recommended practices for the provision of information systems and information technologies to police
   - Empower the police forces to set out standards that may be beneficial to the field of policing.
   - Change and improve ways of working
   - Pioneer standards as a blueprint for information system development and provision to police forces.
   - Empower police leaders to assert their needs and prevent unfair or complex service delivery terms.

6. Subsidised sale or lease of Athena system API to police forces who buy into the service enable police forces autonomy to develop their capabilities that depend on core elements of API
   - Set out agreements on use of API
   - Provider supported access to API
   - Aligns software service delivery to the needs of policing

7. NEC to provide updated roadmaps for improvement of user interface and software functionalities.
   - The provider provides clear timelines and deliverables related to improvement
   - Deliverable terms may be built into the standards documents in recommendation 5.
   - Enable awareness of changes and police input into changes
   - Ensure preparedness and enable police officers to train officers in house.
   - Support development of digital capabilities in good time
   - Empower police forces on how software is developed for them

8. Police forces to enable an internal oversight team to log and collate outage and software useability concerns
   - Establish a route for junior officers to log, contribute their concerns and suggest solutions.
   - Empower, include, and improve morale of staff
   - Enable enumeration of impact of outages, disconnections, unavailability on police demand and costs on an ongoing basis.

9. Police forces and NEC to establish an independent ethics committee to evaluate the use of information systems services.
   - Ensuring oversight and adequacy for purpose
   - Ameliorate ethical concerns.
13.3 Selected Stage 1 rich pictures – SSM in action

This section provides insight into three other problematic situations to which soft systems methodology was applied. The inclusion of the initial rich picture highlights the simple and detailed approach soft systems methodology encourages. It also gives insight into the scope of use of SSM for visualisation of processes in order to provide understanding and cooperative deliberation that includes varied perspectives.

13.3.1 The management of public dis-order

The rich picture included in this section illustrates the first step of SSM. The image shows the setting, processes and people involved in the police response to public disorder. It highlights various streams of work, resources, tools, and artefacts including technologies. Different problematic situations are expressed within this initial picture and the common problem related to the use of technologies to manage public disorder in local settings. Subsequent steps of SSM would involve refinement to the rich picture to segregate the problematic situation ending with presentation of a rich picture that either shows one problem limited to a department or linked problems which influence and affect one another across the organisation.

![Figure 29: A simplified rich image showing public order management](image_url)
13.3.2 Intimate personal violence – initial response and investigation

The rich picture included is representative of the initiation of SSM in a problematic situation involving frontline response police officers and specialist intimate personal violence specialists alongside a number of other departments who influence the processes involved. The initial image depicts the work setting, highlighting the people and processes involved in the response and investigation of intimate personal violence. As the SSM progresses, the image could either be refined to isolate the problems affecting or related to frontline policing or the specialist team, or it could be treated as a collective problematic situation in which all of the noted problems are treated together.

Figure 30: A simplified rich picture of intimate personal violence investigations
13.3.3 Investigating and locating vulnerable missing persons

To visualise the context of missing persons investigations, the initial rich picture includes various perspectives, a summary of different approaches taken to the situation in the police organisation. A range of techniques, tactics and technological tools are employed in the process, each has its intrinsic benefits, however they collectively give rise to problematic situations. The rich picture illustrates this enabling refinement and reduction. This initial messy, rough image also enables agreement and compensation for alternative views. This leads to clarity and establishment of common and agreed problematic situation/s.

Figure 31: A simplified rich image of missing persons investigations

13.4 Conclusions to the chapter

Within this chapter, findings and recommendations have been made using Checkland’s soft systems methodology as an analytical process. Informed by ethnographic insights, the SSM steps involved cooperative evaluation of problematic situations, identification of shared/common problems and articulation of solutions.
There are some limitations to the analytical processes. They were all conducted using views collected and discussed with police officers which could be said to exclude the views and lived experiences of the other parties involved. However, there were some marked advantages. The perspectives that gave rise to the instantiations of SSM were not simply collected, they were observed over thirty-eight months of immersion at the two police forces.

The views that were shared and consensus on the problematic situations and potential solutions were elicited persistently with different groups of police officers in various departments at two different police forces albeit they have a close relationship. Additionally, the process involved reference to openly available documentation about practices and processes authored by the other parties who were not part of this research.

Reliance on these documents provided understanding and clarity, constituting enquiry lines in some instances in the process of refining the situations that were deemed problematic. The documents also provided a means of enabling and encouraging solutions that were feasible with capacity to serve as long term transformations from a practitioner perspective.

Summaries of the various stages of the process and recommendations for two selected problematic situations using soft systems methodology79 (SSM) presented, highlight worldviews in dynamic settings, expressing the outcome of empowering research participants, encouraging co-ownership of problems and co-creation of solutions. The three first step outlines included in the preceding section highlight the versatility and usefulness of SSM in large and complex settings, providing indications of problematic situations which are open to learning, collaborative solving and improvement.

79 Soft systems methodology is a learning and inquiring approach developed by Peter Checkland. It is used for intervening in human situations where there are problems. It involves identification and illustration of real-world problems, illustrative modelling of purposeful activities, comparison of idealised perspectives with the real world and articulation of desired actions/solutions.
Chapter 14: Discussion

14.1 Introduction

This chapter discusses the ethnographic insights and builds on the discussion about outcomes of Checkland’s soft systems methodology outlined in the preceding chapters. Policing practices are relevant in the social research context because of their proximity to social and societal balance/equilibrium (House of Commons, 2018). Police practices are also relevant in the information systems research context because understanding practices enables conceptualisation of police work (Wankhade and Murphy, 2012) which includes their dependency on information and information systems (including associated ICTs) to support the execution of duty.

The research process involved learning and subjectively understanding the perspectives of those who do the work, what do they do, why and how they do their sociotechnical work in policing. The characterisation of the processes, and tasks that stem from (or are driven by) communication, information and its use and management has been central to this research. It has enabled insight into the easily overlooked and mundane tasks of communicating and information use, the day-to-day use of practice knowledge and exploitation of organisational knowledge as seen and heard from police officers.

The discourse builds on and contributes to the ground-breaking immersive policing research carried out by Banton (1964), and the exploration of technology use in policing by (Ackroyd et al., 1992) recognising that their contributions continues to be informative. It contributes a comprehensive characterisation of police practices, procedures and the sociotechnical nature of police risk assessment and decision making work building on the discourse presented by others scholars who have explored various socio-technological aspects of policing such as Baber et al. (2001)’s exploration of the process of engineering personal technologies, Chan (2001b) discourse regarding the influence of technologies on police

This chapter discusses the insights into cross jurisdictional practices at Bedfordshire Police force and Hertfordshire constabulary outlined in the previous chapters. It summarises and critically discusses an understanding of the ways of doing risk assessment and decision making in policing with the information and communication technologies and technological artefacts available to them. It highlights concepts and offers up characterisations of the police in their role as knowledge workers practicing meaning making in the networked and highly interdependent sociotechnical organisation that characterises policing today.

14.2 Policing practice

Police work today is characterised by execution of activities, processes, and procedure pursuant to crime prevention, punctuated as exemplified in this research with a range of demands for police emergency response to medical and multifaceted social ills. Although much of the earlier explorations of the world of policing by Punch and Naylor (1973) do not account for variations in classification and account for the nature of crime and the associated insecurities of the twenty first century, their descriptions of what policing entails resonate with the findings of this research.
As the insights from this research showed, Banton (1964)’s assertions about variations in social structures remains relatively applicable to individual police forces in England including the sociological advancements of others such as Punch and Naylor (1973), Skogan (1990) and Shapland and Vagg (1988) who discuss broad nature of policing work given the observed diversity of requests for police assistance observed during this research.

During this research, it was evident that there was some traction and change had occurred since these scholars’ work, some of that change was highlighted by Mawby (2000) who discussed the transitions to modern policing, demonstrating that policing has moved on since their explorations by outlining a number of key inquiries that led to significant changes to policing. Additionally, despite various arguments highlighting slow progression that seemingly standdown the predictions of a paradigmic shift by Wright (2010), this research found was reflective of his assertions that future policies would be reflective of the changing face of communities being policed, and a shift toward ‘new police’.

Frontline police was observed during this research to be a combination of disorder and crime prevention and intervention, protective work, emergency health response, and service delivery to meet the gaps left by funding cuts to other public agencies. There was also a driven interest in implementing diversionary and preventative policing approaches. This reinforced the arguments Wright (2010) raised regarding the need for police alignment and adaptation to accommodate the evolving social, political, technological, and economic environment given the diminished scope for centralised political control within the emergent cosmopolitan society.

Invariably Policing practice then evolves around socialised practices that involve communication, the evaluation of information about risk and the implementation of structured strategies using ICTs as a facilitative tool to prevent harm through interventions and decision making.
Given this insight, in the context of this research, the concept of ‘new police’ was considered ambiguous given the residual influence of political and social traditions and cultures which continue to drive criticism, scrutiny, and demand highlighted by scholars such as Innes (2011) and Bowling et al. (2019). In particular, it is difficult to view police as a national entity or enact national and centralised control of all police forces. Despite broader national governance, the current governance of policing is localised in nature due to the transitive nature of crime and the evolving demand for policing driving inherently different policing needs from locality to locality. As a result, it is important to view policing today in the context of the emphasis on risks emerging due to the demand for prevention of local harms and crime as outlined in Muir (2021).

The culture observed at Bedfordshire and Hertfordshire police forces was one of careful countenance and driven interest in achieving a safer community. Given the diverse populations the two counties, police officers were driven and attentive to domestic incidents, disorder, complex and challenging incidents involving socio-medial and community problems. Police officers demonstrated communication, problem solving, analytical and socialisation skills. Their use of information even when limited was worlds away from Ericson (1989)’s allusion to secrecy, autonomy and organisational practices that enable restriction and control publicity and knowledge about their activities. Instead the police officers expressed openness, and within that togetherness and support for each other under challenging conditions reinforcing the persistence of the ‘learning to cope’ modality highlighted by Bristow et al. (2021) and expression of police cultures typical of a continuity of older archetypes despite the challenges they encountered due to staff shortages and problematic technologies attributable to the persistence of pressures and dynamic forces associated with the role of policing discussed by Loftus (2010).

There was some potential for improvement in general practices given the shared perspectives about distance and communications between senior and junior ranks indicative of a need for
better visibility and openness from the senior officers. This could be a means of reinforcing co-ownership of the policing mandate, boosting teamwork, morale, and trust between the senior and junior officers. With some similarities to the insights from Hunter et al. (2019) regarding diverse perceptions and limited pathways to encourage participation in research following their investigation into the adoption of evidence-based research efforts in policing, this research found that there was scope for police leaders to utilise research-led means for exploiting the knowledge and expertise of their junior officers, and engage them in discussions about innovation, research and knowledge-based practice. This would involve exploring and exploiting the skills of junior police officers to understand their diverse background and how it contributes to positive diversification sensemaking practices given many of them have had diverse educational and professional backgrounds prior to joining policing forces.

The various police leaders at Hertfordshire and Bedfordshire were open about their constraints, interested to know what they could do to improve and curious about the welfare and overall work ethic of their officers. They were aware that junior staff were less likely to communicate or volunteer information or innovative ideas unless compelled to do so. Some senior officers also felt that it might be relevant to operate schemes or practices that normalise their presence on the operational frontline on a routine basis, to reorientate them with the current rigors of frontline policing and expose them to the realities of strategic decisions. There was scope to improve relationships and boost morale by engaging in practices that normalise and include senior officers’ presence in frontline operational roles on a routine or regular basis. As discussed by Roycroft and Brine (2021) contextual understanding of multiple subjective risk decision making practices and perspectives including an understanding of shifts in the cultural continuum is essential in police leadership. Therefore, implementation of such a practice would have a likely impact of
supporting understanding of the impact of their risk decision making by reorientating them with the realities and rigors of the roles junior officers perform.

Police work was observed to comprise of concurrent and semi-ordered activities, and these actions were dependent on information, communication, the context of information received and the context of the actions of others who provide and motivate reactions and actions in response to the likelihood of risk or harm to people and communities. This context was shaped by the actions of police officers and designated police staff who work cooperatively and interdependently within the police organisation. Of note, this context, and the way of doing was also affected and influenced by agents that the police have to comply with such as lawmakers and politicians and those inevitably have to interact with, cooperate with or collaborate with inside and outside the organisation.

Overall, the capacity to make decisions about risk were influenced by a number of factors expressed in the relational and situational understandings elicited including:

1. Working Knowledge of police practices
2. The effectiveness of communication tools in use
3. The efficiency of ICTs that support communication, information management and knowledge management
4. The functioning of the information and communication interdependencies in the organisation
5. The capacity to requisition and maintain organisational knowledge from internal and external sources.
6. The level of engagement and compliance with organisational national intelligence model practices and the availability and suitability of ICTs necessary for this.
7. The ability to access and evaluate external global police knowledge on systems such as the PNC and PND
8. The capacity and adequacy of engagement with the national decision model in decision making, and the continued relevancy of the model in its current state.
9. The efficacy and effectiveness of the intelligence led policing practice at the police force
10. The adequacy and efficiency of access to information, intelligence, and knowledge necessary for decision making

11. The specificity of politically led policies and legislations and the scope for police discretion in applying or implementing these.

Although it is desirous to assert that the police forces are now in a new era and free of political control, the reality is far from this. In the case of this research, one of the most influential of these are these external agents who set out policies. Mawby (2010) highlights demand the highly changeable and frequent demands by government places on police forces when issuing edicts to implement various approaches and requests on diverse issues as a means of sustaining legitimacy. For instance, there is limited clarity about how the police and local authorities should forge an equal relationship to prevent crime, creating conflict between the situational and social approaches police forces adopt. In the course of my research, the police response to changing legislation, political directives including responding to the demands of scrutiny from communities, governmental and non-governmental agencies was characterised by expression of resolute coping, managing, and reinventing their approaches and efforts to sustain an adequate momentum.

Furthermore, the observations during research and the various national incident ongoing during the course of this research highlighted the impact of policing the pandemic and disorder. The problematic situations arising resonated with Mawby (2010)’s earlier assertions and Bowling et al (2019) in their discussion about the impact of political responses to global social ordering. In some cases, the pace at which the police forces were expected to respond to demands failed to take the realities of policing into account. As a result, implementations of policies and adoption of innovation is constrained by limited insight into the impact on the role of the police.

The other power lay with agents who either provide information to or cooperate with police officers. Being that the primary precursor and instigation of police action was dependent on
the nature of the information received, the context of the risk of harm and threat implied by informing and cooperative agents, their role created an implicit position of power that could motivate, influence, or impede a police reaction or action. This power was contained by the scope of police powers and use of approved professional practices to determine and establish a police response.

14.3 Information and Communication in policing

Police practice was observed to not only depend on information, but it was also is shaped by communication practices as outlined by Brodeur and Dupont (2006) and the expression of skill as highlighted by Worden et al., (2014) (Brodeur, 2006; Worden et al., 2014). Of note, this research aligned with Trnka et al., (2010)’s description that the operational use of technology is a critical sociotechnical process that is dependent on expertise and influenced by communication process controls and management in their discussion about the importance of ICTs for effective response to emergencies (Trnka et al., 2010).

Additionally, this research also found that the process of information acquisition, use and communication for risk predictions and decision making was not only dependent on the sensemaking of individual police staff and workers but critical for their success aligned to Williams (2008)’s discussions about the knowledge intensity and criticality of adequate information (and communication thereof) for effective intelligence led police work including arguments such a process is supported by the expression of cognitive discernment through meaning making and an expressed capacity to analyse information.

In his exploration of information sharing pathologies, Stanier (2013) agrees with this viewpoint, asserting that the effectiveness of police operational response is dependent on prompt access to information that has value and veracity. He also asserts that information (widely known in policing as intelligence) is essential for decision making, implementation
of risk control mechanisms and structuring operational responses and strategies (Stanier, 2016).

Furthermore, this thesis argues that the insights from the research indicate that the active interaction with pieces of information, rationalisation and reconciliation carried out by frontline intervention and response police constables involves engaging processes and tactics that support iterative risk identification, harm reduction and decision making to satisfy hierarchical response to crime and harm in communities as described by Williamson (2008). Although the perceptions around information acquisition, use and exploitation including communication of information differed from officer to officer and role to role as outlined in chapters 8 through 10 of this thesis there were some commonalities. Summarily, perceptions were characterised by expression of conceptual elements relevant to organisational learning demonstrative of intuitive adaptive process led ways of responding to the wider context of information and communication thereof at individual and organisational levels discussed by Cangelosi and Dill (1965), restructuring of practices by learning lessons from errors and problems as discussed by Argyris and Schön (1978) and reflective interaction with spatial realities including progressive understanding of the outcomes of their decisions as discussed by Hedberg (1981). This behaviours expressed could then be said to involve reflecting on learned and affective assimilation of prevalent police values and cultural expressions through cyclic risk decision making using the national decision model discussed by Lax (2014).

In the case of Bedfordshire and Hertfordshire police, the perceptions of operational staff did not completely align with this. Operational police officers acknowledged the value of intelligence however they were inclined to use and view intelligence differently depending on their rank and use of it.

This was contrary to James et al. (2017)’s arguments about police engagement with information. Although they highlight various perspectives that support their assertion that
operational police officers consider the work of intelligence staff as ancillary to the “real work” of policing, this research found that police staff in control rooms and officers, particularly those in operational and tactical roles were particularly involved in active and intuitive cyclic information gathering and intelligence work in their risk decision making processes. As outlined in chapter 8, police staff and police officers regarded their communication and use of information and intelligence as an evolving process dependent on dynamic discovery of new information or alternative and or contextual understanding of existing information.

For constables and sergeants in frontline or investigatory roles information and or intelligence were useful on a need-to-know basis given their need to engage with intelligence when investigating crimes and making decisions related to responding to incidents. For police constables and sergeants tasked with investigating and preparation of cases for prosecutions, intelligence was of value in the context of developing approaches for long term management of harm and containment of risk. It was also valuable for the purposes of achieving prosecutions. For police officers in tactical roles, intelligence was sometimes a precursor that informed further investigation or planning, however it did not necessarily require detailed extrapolation and analysis to determine meaning, usefulness, or value.

Response, investigatory and tactical officers therefore ascribed importance and usefulness to intelligence when it was presented to them in a format or context that aligned to their role and were observed reviewing intelligence to make decisions. They also expressed perspectives that reinforced their view on evaluating information as communicated and in action to decide whether to use it as a basis for seeking further intelligence or a cue to coordinate an immediate response.

Senior officers were in a cycle of dependency on the call handlers and frontline, investigatory and tactical officers to acquire or receive, assess, and share information about relevant and
critical incidents in a timely fashion. As a result, for officers in senior roles such as inspectors, chief inspectors, superintendents, and chief constables, concisely presented top tier knowledge and analysed intelligence was valuable, informing their resourcing and planning decisions including their overall intelligence led approach.

In this stead, James (2013) in focussing on a broader context of intelligence led policing failures, does not articulate the context of information use and the interdependence of various policing roles in the context of the limited sophistication and information sharing capabilities of information systems at the time. Intelligence is also not explained the context of the varied purposes for information, communication, and intelligence flows which police officers shared during this research.

The enactment and management of intelligence led policing plans was not an operational task for frontline officers, theirs was a cascade of responsibility, delivered to them by way of policies, tasks and procedures. Although intelligence led policing plans were relevant for strategic equilibrium and senior police officers, the dynamism of day-to-day police work created strands within plans that required strategic planning per sub-system at an operational level with attention to dependencies to inform overall strategic planning.

The absence of these contextual explanations of the varied roles of operational police officers most of whom are preoccupied with differing crime response and investigatory duties from James (2013) and subsequently James et al. (2017) detract from the understanding that different values are ascribed to information and or intelligence depending on their assigned tasks and duties. Overall, from an organisational perspective, their assertions that operational police officers ascribe an action-oriented culture to collection, analysis, and evaluation of intelligence in policing was not observed during this research, instead, what was observed mirrored engagement with intelligence in an interactive continuum as described by Argyris and Schön (1978) and Hedberg (1981).
Beyond this, it is argued that intelligence led process should involve practices aligned to the national intelligence model (NIM) described by John and Maguire (2004). They describe NIM as a standardised systematisation of practices and processes related to intelligence related structures that govern the way information is handled and the deployment of resources. It is also described by NCIS (2000) as a framework that complements the intelligence led policing strategy that infuses rigour into management decision making by motivating intelligence system reviews for strategic and tactical purposes.

This use of information is not without its criticisms, such as those presented by Belur and Johnson, (2016) and Keay and Kirby (2018) who cite cultural and systemic concerns regarding analysis and use of analytical products due to shortfalls in organisational knowledge and barriers to analytical work becoming core to policing practice are not only cultural, but systemic, and stem from specific shortfalls in organisational knowledge about analysis and the process of commissioning and using analytical products, amongst other factors. (Belur and Johnson, 2016; Keay and Kirby, 2018)

Indeed, some of the concerns they raise including those highlighted previously by John and Maguire (2003) and (2004) still prevail. However, the insights from this research were indicative of other underlying reasons such as limited funding, data quality, incompatibilities, suitability of available software and the large and complex amount of unstructured and semi-structured big data generated in policing alongside legislative tightropes.

Analysis by hand given technological constraints was noted as a concern that was not limited to software incompatibilities, it related to data quality and data structuring. Unlike private sector organisations where information about people can be structured easily using innovative customer relations management and business intelligence; tools, data and intelligence in policing are not only constrained by legal caveats, but data is also stored either
on the crime management suite or the command-and-control system neither of which are interoperable. Despite the Home office taking an active role in advising and supporting the compliance with the outcomes of the Birchard enquiry and subsequent recommendations to adopt current information systems, given the limited understanding and haste at the time of adoption, the police forces are also unable to develop data extraction tools or pull structured data by requisitioning on a regular basis because they are not provided access to the application programming interface for the high cost software service they use for core information management. Other relevant information is stored on the PNC managed by the home office instead of police forces. This too is not interoperable with the previous two. As a result, data extrapolation from local records is complex and continues to require hand searches by data quality officers and analysts to ensure the extrapolations and subsequent analysis are based on data with veracity, rather than volume (John and Maguire, 2003; John and Maguire, 2004).

For this reason, the police forces have employed and continue to employ various approaches such as the daily summaries from all sub-units. This includes information summaries and problem categorisations using a traffic light system on Aspire, a spreadsheet-based tool provided by chief inspectors who manage the community policing. The result at the police forces is that regular and timely delivery of information is often without specialist data analysis on what could be considered a “need to know” basis. This make do approach representative of adapting and managing to cope and reflective of their continuous construction and reconstruction of their use of the information systems given the inherent constraints. It continues to be the approach taken to apply the national intelligence model and structure the rudiments of their intelligence led approach because of the continuity demands in policing which require them to ensure the delivery of policing services irrespective of the logistical issues they face such as limited funding and or capacity to seamlessly pull data from their core information systems.
14.3.1 The police information and communication web

The policing environment is made up of people in a hierarchical structure, practicing varied yet interlined duties to prevent harm, interrupt crime and ameliorate or eliminate risks to citizens. In these varied roles, information is currency, however in this research, variations were observed in the value ascribed to it, depending on the role of police officers, their tasks and the scope of risk leading up to their decision making.

On the frontline, information is a cue that motivates understanding and human analysis, seeking meaning, establishing, and prioritising demands for a police response in force control rooms. Their interpretation of the context of the risks involved and their decisions on whether to initiate actions to contain risks influences the actions of police officers who intervene and respond to crime at the initial, investigatory, or tactical stage.

Turroff (2002) highlights the epistemology of preparedness, characterising control and command settings and explaining the rationale behind the need to know what is happening before, during and after a crisis alongside the need to coordinate a response by determining who does what, when, why, and how. The insights from this research align with some of his characterisations of emergency room staff and the dynamics of their work.

Control room staff at the police forces researched relied on their information systems and communication systems and their work depended on the value of up-to-date information about potential threats. Additionally, their work was supported by the capacity to designate authority and coordinate people and resources required to enable an adequate response to critical incidents.

The decisions they made were inexorably linked to decision making models such as the NIM, NDM and wider implementation of ILP; and policies that guide the practice of policing. This included political influences and pressures regarding the response to crime and harm. The practices they expressed were shaped by power play between informants and the police
organisation, between the police and external agencies that police depend on for information and between police officers in their hierarchical positions of authority. Practices were also further influenced by the scope of use and scope for exploitation of information, communication practices and the efficacy of information databases and systems.

In the context of this research, police officers were able to further mitigate this power position by evaluating and weighting information recursively, querying databases and searching knowledge repositories, however it was evident from observations of police practices at the police forces that a number of factors could inhibit the process of balancing the power positioning to give police the necessary advantage required to deliver efficacious responses.

These include:

1. The intent behind information that is shared by agents
2. The timeliness and veracity of information provided to police forces
3. The ease of accessing information
4. The efficiency including availability, connectivity, and ease of use of their information systems
5. The practice knowledge of those who evaluate information and knowledge when fielding initial enquiries
6. The practice knowledge of those who assimilate mixed types of information when responding to or intervening in incidents
7. The cognitive ability to query and exact additional information when conducting initial investigations
8. The capacity to exploit new and existing information to determine risk correctly, evaluate harm adequately and ameliorate these by coordinating appropriate response
9. The capacity to determine contextual and practical understanding of information received
10. The accuracy, correctness, quality, and adequacy of organisational knowledge
11. The timeliness, veracity and quality of information requisitioned from external sources
12. The ability and scope to connect linked pieces of information (or intelligence) within internal information systems and from external databases
13. The extent to which procedures that support appropriate use of information and knowledge are embedded as practices within the organisation

14. The capacity for individual officers and the organisation to react to the dynamic information receipt that is associated with emergencies

15. The means and mode of communication and meanings derived from information

Gilling (2010) draws attention earlier perspectives that saw crime prevention as a political issue rather than an operational one, making reference to Reiner (2002) who described police work as a scarecrow function. In his arguments, Gilling (2010) highlights the difficulties in measuring crime preventions, one which is exemplified by the findings of this research in that crime is determined by the provision or acquisition of information, largely dependent on the public making disclosures. Invariably without this information it could be assume that no crimes are occurring. He draws attention to the modern practice of crime reduction instead of crime prevention alluding to police approaches such as place based policing focussing on the Morgan report which highlighted the lack of prioritisation of crime control leading to the advent of crime management models, intelligence led policing and the enactment of the Crime and Disorder act of 1998.

One of the outcomes of the Crime and Disorder act of 1998 was the promulgation of strategic and operational partnerships between police forces and local authorities. Although Gilling draws on the work of scholars such as (Hughes 1998) and Crawford (1998) in his arguments that partnerships have been characterised by police taking the lead and exerting power due to their position of expertise and knowledge of crime, the insights of this research did not support this view.

Rather in addition to reinforcing the problems with multi agency information sharing highlighted by Sheptycki (2004) this research also revealed that the materialisation of these partnerships is characterised by increased demand on police response resources requiring a significant police investment in technologies to support their welfare work, information
systems with advanced capabilities and data driven approaches that are required to manage the expectations driven by these partnerships.

Furthermore, although the police openly share information with the health and local authorities, reciprocation of expertise and knowledge was very limited. Given the funding issues the police issues face the continued sustenance of the work generated by these partnerships was observably placing strain on demand for police services. Although the partnerships appeared to support the potential to enhance police organisational knowledge, the foundational role of the local authorities in these partnerships which included community policing and welfare were seen to be continuously shifting into a dependency rather than a sustained collaborative working arrangement.

As a result, the real world process the police forces employ involves hopscotching, through the various policies, processes, procedures, and constraints without the luxury of hoping to succeed. It involves a balancing of the demands of citizens and the needs of citizens vs policing powers police to acquire, process, store and react to information and intelligence. It involves meaning making that requires cognitive acumen and capacity to assimilate, sort, interpret and determine what is of value. It also requires experience and understanding of the legislative scope to react which is acquired through practice. Additionally, it involves adapting and restructuring approaches given the dependency on information from third parties.

As outlined in the soft systems analysis in chapter 13, despite an inclination to expedite information sharing with other agencies by the police, this gesture is not reciprocated efficiently. This research corroborates the findings of Public Health England (2018) who acknowledge problems with information sharing and collaborative work between the police and other public service agencies attributing these concerns to risk aversion and IT systems. However, it also found that some external agencies lacked standardised approaches (or poor
compliance with the existing) and expressed diverse responses including a culture of stonewalling, reluctance to share information and delays which problematise sourcing information from third party agencies for policing purposes. This had an impact on police workstreams and a consequential effect on sub systems and the wider sociotechnical network creating problematic situations in some instances. The practice it a socialised process of skipping, hopping, and finding firm footing through organisational knowledge and by innovating and applying practice knowledge.

There is some variation to this. Although frontline police officers conduct investigations their work is characterised by two key things—response and intervention. Once they ameliorate immediate risk and or reduce initial harm, their role ends and the cases they create are fanned out to detectives and investigators who will initially appraise the case and any risk elements and decisions highlighted and then begin more detailed investigatory tasks that focus on reviewing and gathering more evidence through interviewing and review of physical or digital evidence and collation of these bits of evidence including any intelligence to build a prosecutable case. Frontline police officers are rarely tasked beyond production of their own witness statement where relevant. The specialist investigatory teams review and compile response/intervention officers’ statements as part of their own specialist risk evaluation and assessment and decision making as to whether there is a case that warrants continued investigation or not and or case that has the relevant weight (as assessed by their CPS liaison sergeant and or inspector) meeting CPS thresholds for prosecution.

The police officers in investigatory roles in specialist police departments utilise information in a similar way to frontline police officers, however they also use information for other purposes. In the context of their work, they use information to determine or establish the most likely explanation for events, incidents, or action. They also use information to prove or disprove their assumptions about what has transpired in incidents where they have no information or when the information, they receive is unclear and or involves conflicting
accounts. This is particularly important for the progression of investigation cases where the quality of evidence determines the potential for successful prosecution by the CPS.

In a similar stead, police officers in tactical roles also use information in the same way as frontline police officers. Additionally, they use information to derive an understanding of a phenomena under investigation. Information is treated as a building block to set out the rationale for special investigations, to plan and operationalise symbolic policing programs and to build a cache of intelligence that supports coordinated police actions such as raids or simultaneous arrests, relevant in their fulfilment of national policing requirements.

Within the upper ranks, information drives a different kind of decision making. The primary flow of information that police leaders depend upon is related to critical incident data and crime response data. They perform purposeful actions sharing and communicating about information generated in the risk assessment and risk decision-making process for day-to-day management of policing. They then make decisions about resourcing and plan ahead for the short term.

The secondary flow is organisational knowledge in the form of big data which is analysed and extrapolated for meaning by analysts. This is not without constraints as outlined by Babuta (2017) in his exploration of big data in policing Kearns and Muir (2019) in their exploration of data driven policing. Analysts at the police force corroborated Babuta’s assertions about limited access to technologies, resorting to analysis using dated and or limited software which still required hand sorting. The perspectives shared were also consistent with assertions made by Burcher and Whelan (2019) regarding problems with data quality and overload complicated by the limited capacity and sophistication of analytical systems. Nevertheless, despite the problems, the analysed output of this secondary flow supplements the primary flow providing police leaders with in-depth understanding of
their policing demand and profile which in turn informs the police forces’ intelligence-led policing business case (Babuta et al., 2018; Kearns and Muir, 2019)

These flows of information observed during this research constitute conceptualisation of police information and communication. The concepts derived from the research data constitute a foundation for the construction of an epistemology of the police information and communication web. This thesis asserts that in the case of policing the internal information and communications is structured as follows:

1. The police organisation is a sociotechnical organisation within which an information and communication web exists.
2. The structuring of information practices is depended upon and closely coupled with communication practices.
3. This sociotechnical system is made up of interdependent sub-systems each of which have their own interdependent workstreams.
4. Understanding these workstreams and sub-systems including their interdependencies is critical to understanding the agency of workers and their purposeful activities.
5. Information flows are latitudinal and longitudinal within the organisation and the understanding of these flows is critical to the sense and meaning making practised by individuals.
6. The sub-cycles within the information-communication web are driven by various contextual practices in each sub-cycle.
7. Communication and the flow of information are interdependent with capacity to influence and shape the actions in other sub-systems.
8. Activities within the workstreams and sub-systems are influenced by the information sharing practices within the organisation and those of external organisations that the police depend upon for information outside the police socio-technical web.
9. Information flows from organisations outside the police sociotechnical are marked with inconsistent and diverse responses.
10. The sociotechnical organisation experiences shocks when information and communication flows are inefficient, disrupted, or unavailable.

Frontline police and operational police decision makers thrive on an understanding of all of these contexts and the interdependencies between the tasks of individuals within the sub-
systems in the sociotechnical organisation as they proceed with agency, applying their know how and accessing information and intelligence. They also adaptively shape their actions to ameliorate problematic situations arising as a result of information acquisition problems.

The practices of the police forces were also shaped by the interactions, continued learning and sense making, and discretion expressed in the agency of the police officers and designated staff. Practices varied according to roles and roles were defined by the hierarchical structure of the organisation. This was further influenced and in the main guided by the awareness, working knowledge and application of policies, procedural activities, legal enactments (such as police powers and legislation). Additionally, the access to individuals who held intrinsic knowledge of policing was valuable, however there were no formalised practices to retain or compile local knowledge, instead learning in this context was tacit-tacit and sometimes constrained by the reluctance to seek intervention which might be seen as a demonstration of inadequacy.

14.4 Police Information and communication systems

As outlined in the research insights, there were two core information systems in use at the police force. STORM and Athena. STORM was limited in use, being suited to the command-and-control environment, supporting the dispatch of police and response to incidents. The system with widest use was Athena, a software service suite that combines four service modules supporting information management in relation to investigations, police custody, intelligence and case management (Black, 2017). The Athena software suite should in principle reduce time and cost on multiple systems, maintain interoperability and provide the added, necessary, and vital service of uniting data from all police forces who use the same software service (Bell and Black, 2017).

The information systems in use at Bedfordshire and Hertfordshire police forces performed four roles. They were facilitative, enabling information management through the captured
sharing of information using communication tools. In this respect, the communication tools were complemented by the retrieval and interpretation of information, with dissipation being necessary for facilitation of emergency response.

Secondly, the information systems supported organisational memory, providing a means for recording, and storing information and knowledge about incidents that required police attendance. Additionally, they also facilitated storage of information about incidents that did not require police attendance but required statutory reporting to the police such as road traffic incidents, loss of identification documents.

The third purpose was facilitation of effective communication about crime and incidents by providing snapshots and details of incidents in a format that could be easily dissipated to and accessed by police officers and providing a secure and reliable means for communicating the same.

The fourth was supporting the wider police force information and intelligence needs, providing a repository of records of incidents attended and records of open and closed investigations. This included enabling maintenance of intelligence records related to persons, places and specific types of crimes and access to big data to support crime analysis and extrapolation.

The perceptions of use of information and communication systems was dependent on roles while decisions to record or store information was influenced by sensemaking, interpretation of legislation and discretion aligned to the insights including levels of skill as discussed by Schellenberg (1997). Views and perceptions of the information systems varied according to role, level of skill and familiarity with the information systems. For instance, response/intervention constables for instance expressing differed views depending on whether they had used other systems before or observed other systems in use elsewhere and found them easier/more user friendly aligning with views from scholars such
as Hauck and Weisband (2002). In the custody suite, custody inspectors either recognised or adapted to the flow of the information systems expressing confidence that the information systems would prompt them to meet all the critical, statutory, and legal requirements for admitting persons into custody, even though others felt it hampered fluid conversations and familiarisation and complicated and lengthened booking in times. is well known that humans shape the use of technologies.

Overall, the police forces expressed a culture of solidarity, displaying a range of coping mechanisms similar to those highlighted by Bristow et al. (2021). It was also evident despite the arguments for collective cultures that individual officers were able to demonstrate a measure of agency and discretion which characterised their interactions and decision-making confirming that a working culture does exist at the police forces. However, the cultures observed were not deviant in nature.

One factor observed which could be responsible for the collective cultures discussed by previous scholars, was the limited funding and length of on-the-job training for new recruits. Additionally, most officers were loath to ask for clarity on the airwave radio, as it was collectively perceived as a show of limited competence. The inadvertent consequence of this was that the working relationship and communication chain that should exist between police officers and control room staff was distant and at times, the collective feelings about how to approach the job might be impacted.

The other was the potential for risk to be evaluated inappropriately by control room staff or information to be transmitted inaccurately from third parties or the control room leading to mistakes. Inevitably, the risk information models in use such as THRIVE went some way to ameliorating this, and beyond that, police officers were quick to admit that even in those circumstances, as response officers, they were more likely to recognise and accept high levels of dynamism on the job and conduct their own risk assessments as and when needed.
Beyond this, the police forces demonstrated that they had taken steps to address concerns regarding information omissions, duplications and errors highlighted by Stainer (2013) indicative of a positive shift in sub-cultures at the police forces studied. Finally, the concerns about divided systems noted by Stainer (2013) still prevail across police forces in England and Wales as outlined in Chapter 10.2.1.

**14.4.1 Storm Command and Control**

The Storm Command and control information system was central to the work of the police control rooms supporting the recording of incidents reported to the police. It served as a log of police response to any enquiries, information from informants and emergency response. The information is dualized, providing a means for the police to prioritise risk and harm and coordinate a police response and supporting understanding and analysis of crime and police demand to enable planning and operationalisation of resources.

Operational use of technologies is described by Trnka et al., (2010) as a critical sociotechnical process, dependent on expertise and influenced by communication process controls in their discourse about the role of ICTs in crisis management. This aligns with the use of STORM command and control systems which incorporate prompts to use THRIVE in the police force control room.

The use of THRIVE prompts intercede in the decisions that control room staff make about risk and harm, presenting a means of resolving the issues of non-engagement with THRIVE in control rooms outlined by (Lyall, 2017) and the use of the model also allows intervening police officers to guide reactions and prevent maladaptive responses. The information system was embedded at the police force the value derived from using the same system as several police forces was exemplified when officers were tasked with emergency calls for a neighbouring county, they did not have direct collaboration with. Although the STORM system provided a means for capturing local requests for emergency help it has limited
interoperability with national databases required for information verification or risk evaluation.

As a result, the emergency response required staff to access other systems to gather more information about places, people and incidents using other databases such as Transearch, Fed Search, PNC and a number of other databases that enabled access to telephone directories, vehicle registrations and electoral registers. In this respect, control room staff demonstrated high levels of coordination when taking emergency calls which required using multiple tabs to open various databases to perform searches. Of note, there appeared to be some amalgamation of some databases and fewer legacy systems in use compared to the findings of previous research where the number of databases were much higher (Kazeem, 2018)

14.4.2 Athena Software service

Hughes et al., (1992) explain the multidisciplinary context and situatedness of ethnographic computer supported cooperative work research, highlighting the scope for eliciting varied and rich real-world understandings of the socially evolving human activity and functionalities of technological systems, shaped by those who use them. They further assert that the effectiveness of technological systems depend on interventions that involve knowledge and incorporate understanding of work practices in the context of the interested groups within an organisation including the organisational setting and purposes (Hughes et al., 1992).

The greatest motivation for taking on Athena by the participant police forces was the desire and need to act on the findings and recommendations of the Birchard Inquiry report which was released in 2004 (Birchard, 2004; Collier, 2006). Although there was some support

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80 The Birchard Inquiry was a public inquiry into child protection procedures at Cambridgeshire constabulary and Humberside police force. The findings highlighted concerns around effective intelligence management and record keeping. It also highlighted problems with the efficiency of information sharing between police forces and other agencies. Such as disparate development of different local IT systems at police forces with limited action to address problems and a lack of a national intelligence IT system.
available through grants and guidance from the home office, the problems that were highlighted by the Birchard report and the efforts to adopt new and better information systems with the potential to share and link to data from other police forces were complicated. These problems were thrust upon police forces who had diminishing funding, limited IT capabilities and limited expertise about and around the pace of information technologies and information systems development.

When the Birchard report was released, the coordination of police IT strategies, information systems and technologies was coordinated by the Police Information Technology Organisation (PITO\(^\text{81}\)). PITO had originally taken charge of the police national computer project run by the home office, later taking on its role as a sole supplier of national police IT systems.

It was subsequently reviewed, and it ceased operations in 2007 following criticisms about its effectiveness which were outlined in the independent McFarland report\(^\text{82}\) in June 2005. The criticisms of PITO were related to assertions that its structure was ineffective, flawed, and ineffective. It was succeeded by the national policing improvement agency (NPIA\(^\text{83}\)) in 2007 led by which was created following a police reform mandate under the Police and Justice Act of 2006.

Some of responsibilities PITO had fell back to the NPIA including the development of a national intelligence database. NPIA took over the implementation of the recommendations of the Birchard report. The organisation became responsible for development, implementation, and standardisations of police technologies in England and Wales. This included management of the airwave communication network, management of the

\(^{81}\) PITO was an organisation responsible for responsible for managing the development and delivery of IT systems and IT strategy for the police forces in Great Britain between 2002 and 2007.

\(^{82}\) The McFarland reports was an independent review of the police information technology organisation in 2005

\(^{83}\) NPIA was a public body created in April 2007 to replace PITO. It performed the role of supporting police development of IT capabilities and strategy. It ceased operations in 2011 transferring its operations to the Home Office and the now defunct Serious and Organised Crime Agency (SOCA) and the College of policing.
information systems strategy for police service (ISS4PS\textsuperscript{84}), management of the Police national computer (PNC), The Dangerous persons database, and the National streety for police information systems (NSPIS\textsuperscript{85}).

It also had powers under the Police and Justice Act of 2006 to mandate an IT strategy for police forces and impose processes and technologies on police forces that were not in compliance with national standards. The NPIA was later dissolved in 2011 following a government white paper in 2010. It was succeeded by the Police ICT company now known as the Police Digital Service (PDS\textsuperscript{86}). The PDS is a private company tasked with partnering with the police to achieve the capabilities previously managed by PITO and NPIA.

One of the problems PITO had highlighted in previous years also had some bearing. It was difficult to encourage business leaders at different police forces to agree and or adopt one single information system. It was evident police forces could not afford to acquire proprietary information systems which would require extensive requirements elicitations, potentially lengthy software development and continued maintenance.

Although the changes enabled the continued governmental support necessary to ensure information technology capabilities would be achieved, the cost of compliance and the cost of participatively developing IT strategies and local police databases fell to the police forces. Police business leaders were ordinarily expected to have understanding, knowledge and expertise through organisational awareness and oversight which would encompass their information technologies and information systems. However, police leaders were all serving police officers whose main experience lay in the prevention of crime.

\textsuperscript{84} ISS4PS was a group of projects which commenced in 2005 to support achievement of capabilities for use of ICT within the police service.
\textsuperscript{85} NSPIS is a legacy police information system previously used to manage human resources, police custody, case preparation and command and control information and data.
\textsuperscript{86} The PDS is a private company and UK policing and law enforcement partner. It is responsible for developing capabilities and delivery of a national policing digital strategy providing technical assurance, digital transformation, and innovation for policing information technologies. It is governed by a board of directors that include police and crime commissioners, the police technology council and representatives for the home office and the national police chief’s council.
As a result, when it came to adopting and implementing local information systems to manage local intelligence, police force business leaders with limited experience of adopting complex information systems were tasked with making quick decisions regarding the same. Although adoption was slow and varied, in the wake of the Birchard report (Birchard, 2004), police forces were eventually motivated toward innovative tools following orders to adopt systems that supported better information sharing and a network centric approach Cowper (2007).

Given the demands for information sharing and the need for them to adopt of systems that would weather advances in technology, they were left reliant on the available expertise from the previous work of PITO and that of NPIA. Additionally with no resources to drive development of systems on their own, several police forces took on third party software such as the Athena service system.

Although there was some support available through grants and guidance from the home office, the problems that were highlighted by the Birchard report and the efforts to adopt new and better information systems with the potential to share and link to data from other police forces were complicated. These problems were thrust upon police forces who had diminishing funding, limited IT capabilities and limited expertise about and around the pace of information technologies and information systems development.

For the police forces, they were aware then needed to implement new information systems that would go some way to satisfying the overall need to improve data management and sharing. As a result, the police forces took steps to engage with other neighbouring police forces to work collaboratively and potentially identify and develop a shared information system.

Although the changes at the bureaucratic level enabled the continued governmental support necessary to ensure information technology capabilities would be achieved, the cost of compliance and the cost of participatively developing IT strategies and local police databases
still fell to the individual police forces. Police leaders were ordinarily expected to have understanding, knowledge and expertise through organisational awareness and oversight which would encompass their information technologies and information systems however given limited resources and diminished funding, one of the outcomes of this was that police forces could not afford to acquire state of the art proprietary information systems which require extensive requirements elicitation, potentially lengthy software development and continued maintenance.

Hauck et al. (2002) reinforce the findings of this research regarding limitations of resources and limited sophistication of information systems and associated technologies. They argue that disparity of data stores, difficulties with technology use and limitations to seamless information sharing capabilities is consistent despite limited room for delays and errors in policing. Additionally, it is plausible to agree with Chan (1997) and Paoline et al. (2006) about the role of cultures in shaping systems use given the laboured journey to implementing the information systems. Furthermore, it is also plausible to agree with Chan (1997) and Cockcroft (2020b) in that policy making problems have precipitated the current cultures expressed. It is undeniable that the pressures and problems with implementation including resistance to change amidst varied expressions of known aversions to paperwork have had some influence on the overall perceptions police officers expressed about information innovative technologies.

Beyond this, what this research identified during the soft system methodology was that the difficulties with information systems are exacerbating organisational capacity to manage information. With regard to the mobile platform Tuserv, which provides mobile access to Athena, the uptake was limited to specialist departments who repurposed it for collaborative sharing with the crown prosecution service. The majority of police officers in frontline roles admitted they do not use it, citing difficulties with connectivity, ease of use and practical needs which resonated with the assertions about ambiguity and divergence of use of mobile
technologies highlighted by Allen and Wilson (2004) who explore the reasons behind initial acceptance and rejection of a mobile technology. Although they conclude that the embedment of technology was influenced by the scope for police officers to reorder action and behaviours, the insights from this research only agree with this in a limited way (Allen and Wilson, 2004). The was related to roles and duties in the first instance, then to problems (actual and consequential) with the mobile systems, the latter being more marked. Police officers at Bedfordshire and Cambridgeshire were observed as they encountered repeated difficulties using mobile systems such as Tuserv. Connectivity, availability of service and the variation and limitation of the interface when used in fast paced roles was evident.

The insights about the Athena software service were also attributable to the race to enforce policies for change given the focus on containing risk, managing fears and soothing public concerns as outlined by Reiner (1992a), Ericson and Haggerty (1997) and (Cockcroft, 2020a) in the wake of the public response to failures associated with poor information sharing practices.

Beyond this, the arguments raised by Chatterton (1989) regarding the conflicted response to paperwork were reinforced, albeit there was little scope to attribute this to self-interest because there was more evidence demonstrating the complaints made about the information systems were valid and the compliance despite problems as a learned practice and coping mechanism as outlined by Bristow et al. (2021). Furthermore, the assertions made by Hauck and Weisband (2002) based on their evaluation of police response to adoption of new systems in comparison with legacy systems present additional rationales for dichotomous and conflicting perceptions of Athena. Their argument that variations in perceptions and views are the result of variation in individual levels of familiarity and expertise with newer systems, nature/type of use depending on role and duties, perceived costs of adopting new practices, absence of desired features and perceptions of administrative work were all found to be relevant. Despite this, the context of the problematic situations arising as a result of
adopting the software service indicated that rather than become embedded, police officers and the police forces are now in a continuous process of coping and compensating for the shortcomings of the service turning to practices which affect staff welfare. The impact of this was evident and expressed in the body language of those who provided insights.

It was also evident in the observations of manhours dedicated to battling with the information system due to sudden outages, poor connectivity, unavailability, and limited interoperability. The problems also highlighted the risks of creating software using abstractions of activities which in the case of the Athena software has led to the delivery of a software service that mimics the ‘black and white’ expectations for information collection and storage based on steps and stages from police activity glossaries.

Instead of the software to run seamlessly and complement other policing activities and duties, with a built in understanding of the primary aims of the police organisation including the rigors and practicalities of policing work the software offers an opportunity to comply with legislation and meet government led information sharing directives. In the event that new legislation arises or specific administrative needs arise, instead of updates to the software, police forces were forced to adopt bootleg approaches such as those described by Ericson and Haggerty (1997).

The recording information accurately and appropriately, maintaining records of reported incidents, crimes, investigations, detainee vulnerabilities and PACE compliance records increases potential for officers developing avoidance practices and that some officers are seeking alternatives and work arounds which put their welfare at risk.

14.4.3 Airwave radio

The TETRA airwave radio system was rolled out in the UK in 2005 (Barber, 2022). Currently used by the police forces in this research, airwave radio has been the standard for emergency services communications for more than 80 years (Gomez et al., 2015).
Additionally, point to point land radio mobile network have been instrumental for enabling interoperable voice communication across emergency services (General Dynamics, 2016; Allen et al., 2008; Allen and Wilson, 2004).

According to Gomez et al. (2015), the airwave system is noted for its capacity to provide effective connectivity across wider distances using fewer transmission sites in comparison to mobile broadband data systems such as 4GLTE and 5G. As observed during this research, police, ambulance, and fire service operatives including other agencies such as the transport police were able to communicate effectively using the same network. Described by participants as a lifeline in frontline operational response settings, response officers mostly used the police airwave radio to communicate with the command and control call centre/force control room. Police officers also used the radio to contact each other, their supervisors and other emergency services. Some supervisory officers listened to the police radio discussions as a means of gaining insight into the current workload and demand prior to and during work hours.

In the context of this research, insights about the ongoing developments regarding the emergency services mobile communication program (ESMCP) were mixed with many officers expressing concern about connectivity and stability. Others expressed concerns over future reliability and delays to implementation of the new emergency services network (ESN) based on mobile broadband technologies. Baldini et al. (2014) assert that emergency communications tools and networks should provide broad connectivity and efficient communication while remaining disaster ready, able to cope with emergencies that involve infrastructure degradation. The concerns raised about ESMCP and ESN resonated with the assertions Baldini et al. (2011) make, such as the need to recognise limited applicability of innovative ICTs in the public safety domain.

Of note in the course of this research, the cost of maintaining technologies was a concern for the police forces and in the case of the Airwave radios, the hardware equipment was sturdy,
requiring fewer replacements over time as the devices coped with longer periods of software upgrades to the land mobile radio network. Although the TETRA network is the subject of continued improvement (Baldini et al., 2014; Gomez et al., 2015) with some concern about with suitability and associated costs of the use of radio frequency networks for higher data rates Baldini et al. (2014) raise valid concerns with systems such as the proposed ESN. They argue that innovative technologies such as this introduce risks and larger costs such as conducting peer-to-peer communications over unstable networks with limited broadband connectivity and shorter equipment lifecycles with the tendency to become obsolete quickly.

Overall, the police officers were observed to be benefiting from very good radio connectivity in various terrains including unbuilt and rural areas, using their radios to communicate through authenticated and encrypted group and individual calls, supporting integrated voice and messaging services including individual and group calls as outlined by Gomez et al. (2015). On the other hand, police officers’ work mobile telephone and mobile data connectivity varied from location to location in urban areas with less reliability in remote/rural areas when in the field.

14.4.4 The practicalities of information and communication systems

During this research, the use of information systems was an integral part of the duties of police officers and staff that were observed. The understanding gained was that officers still do not relish the thought of paperwork; however, paperwork has now transitioned to administrative work using information systems. Although change resistance to technologies is a common characteristic in large and complex police organisations as described by Koper et al. (2015) alongside organisational culture as discussed by Gottschalk (2007) the trajectory of uptake of technologies and their use at Bedfordshire and Hertfordshire police forces (particularly in operational settings for call management, incident management, investigations, crime recording and or case management) did not provide much room to police officers resist the use of the technologies available.
Given the procedural constraints and performance related pressures on police officers, it was largely difficult for response officers to circumvent the established processes requiring information to be recorded despite the difficulties associated with doing so. The observed process reinforced the arguments made by Ericson and Haggerty (1997) regarding increased workloads as a result of forcing compliance with processes and procedures that encourage administrative aspects of knowledge work.

The disruption they experienced during the deployment of the current information systems and the continued problems with the use of the information system were impactful on morale, ability to work efficiently and scope to respond to requests for assistance in the context of their work and duties. As discussed by Manning (1982) and (1992) need for sustained and continued reliability of information systems and communication tools was relevant and important to their use of information and their capacity to assess risk and make decisions (Manning, 1982; Manning, 2003). Overall, they were simply desirous of ICTs that are quick, functional, and operational and in doing so they drew comparisons with old systems (and may have reverted to using them given the hardships) had it not been for the means of implementation (which removed that opportunity).

There was concern over the potential impact of new communication systems and these concerns were valid given the variation in mobile connectivity in areas with a mix of rural and urban areas present with problems regarding mobile connectivity. There were concerns with plans to amalgamate multiple functions into one handheld system on the proposed emergency services network, given they currently have the ability to use the airwave radio in various locations with scope to use their mobile phones and laptops should connectivity fail and their experiences with connectivity failures when relying on mobile phones that use technologies similar to the proposed 4G networks.
Where it concerned information systems, the most prominent concern from an IS practitioner perspective were the problems associated with use of software bundled as a service. This constrained their control over features, reliability, availability, and ease of use. Additionally, many of the views expressed were indicative of concerns that arise when information systems are designed without the full understanding of the real world in which they will be used. Outside of this, the reasons for reliance on old technologies was apparent, most of those reasons were sound, police officers preferred them because they came with a better measure of reliability, connectivity, ease of use and accessibility than the newer systems. Their concerns about new technologies were also somewhat valid given the ease with which the older systems worked versus the difficulties of using the new systems.

Beyond this, there were also concerns that the push toward innovative ICTs as a means of saving resources and reforming their practices would actually have the opposite effect, costing more and driving more expenditure in the long run. During this research, leaders indicated there was some concern that the difficulties of using technologies had an impact on staff welfare, increasing sick times and resignation from staff they had trained. Their most prominent concerns however including that of junior officers was that of failing to comply with government led policies, delays to their overall response and making mistakes as a result of dependency on technologies that were adequate, but evidently not suited for a fast-paced time critical environment.

Scholars such as Ariel (2019) explains problems with technologies in policing, highlighting the relationships between risk aversion in policing and the failures and problems with implementation of technologies. Drawing on the work of Skogan and Hartnett (2005a), Lum et al. (2017) and Egnoto et al. (2017), Ariel asserts as is true of the findings of this research, that successful implementation of technologies depend on the power and political influences prevailing and the technologies are advanced and advocated. This research however found that although there was capacity for technology to empower the police forces, the limited
sophistication current systems have constrained the overall value it brings to the police officers who utilise it frequently.

A key observation in the course of this research was that the distinction between local information systems and the police national computer (PNC) are not well delineated in existing literature. It was evident that the PNC was useful to police forces, providing them with quick access to records of cautions, arrests, sentences and so on, however, the PNC is not managed by police forces, and it does not have the scope to hold intelligence with tiered levels of annotations the same way local information systems do.

PNC is managed by the UK home office and linked to criminal justice departments who feed in updates as relevant. In all observed cases, PNC checks were carried out by control room staff on request from police constables or on receipt of emergency calls. Data from PNC would then be linked to specific emergency dispatch records to supplement any local data already held. Rather than serving as a day to day information system or go to for police officers seeking information, the PNC serves as a reference database while the local information systems provide access to a ‘knowledge’ repository, records, and information about people, places, and events in and around the locality in which the police force provides its services.

Beyond this, the data collected in force custody suites had some relevance to the PNC. Because detained citizens would often be bailed to return or bailed pending further investigations, these records were routinely fed to the PNC. This was not without its difficulties because some bail conditions such as ‘pending investigation’ did not have a finish date which meant choosing a date within the parameters of the PNC’s record acceptance and the local information systems’ future date thresholds. Interoperability was also problematic. As result, there was an additional workload in custody suites resulting from reviewing, updating, and resolving records for bailed citizens.
The inadvertent role of immersive research into information systems such as the work carried out in the course of this research is that it provides insight into the ‘problem/s of policing’ encouraging consideration of issues that inherently influence and affect policing practice and policing as seen by the public. The understanding of worldviews and potential problematic situations from ethnography have supported situational understanding, helping to discern starting points and sustains focus on the real world such that it becomes easier to illustrate worldviews, identify objectives and elicit actions. In the case of this research, the two highlighted soft systems methodology cases exemplify a compensation for the non-problem solving nature of ethnography enabling co-created transformative solutions that relied on sharing perspectives (Holliday, 1990) and debate supported by therapeutic and interactive facilitation (Horlick-Jones and Rosenhead, 2007).

Some of the concerns and problematic situations related to the successful use of ICTs by the police, however, sit firmly outside of the control of the police forces. These relate to interoperabilities, extended costs of acquisition and adoption, delays to implementation and disruption as a result of ICTs for police that are managed centrally by the home office.

The insights gathered regarding plans to replace the current airwave radios with an emergency services network (ESN) for voice and data communications on 4G mobile networks were insightful. These plans to engage an ESN including integrated Mobile Communication devices to replace existing airwave radios under the emergency services mobile communication programme (ESMCP) have been ongoing since 2011 without materialisation of key functional deliverables or meaningful implementation. Whilst police officers have expressed concerns that proposed network may lack the connectivity afforded by the current radio systems, the wider concern is that the systems will bring with them new costs that will further strain police forces and new challenges that will impact on efficacy and legitimacy in the delivery of key policing duties.
The police national computer (PNC) and police national database (PND) still maintain limited interoperability with popular police information system services such as Athena and Niche. These core national databases are used by all police forces to manage conjoint crime data resulting from activities across the criminal justice system are maintained and managed centrally by the home office. Although, these two databases have been at the centre of national law enforcement data program (NLEDP\textsuperscript{87}) since 2016, the realisation of the benefits this should bring to operational policing have not materialised, nor is there clarity on the level of disruption deployments may induce. The police forces are therefore proceeding with continuing to improve their local information and communication systems without the benefit of understanding how they might harness or build interoperabilities with the new system while coping with the uncertainty around continued use of the existing PNC and PND.

14.5 The dynamics of police knowledge

The communication and information cycle discussed in the previous section were critical to organisational knowledge and memory at the participant police forces. In a similar stead to Gottschalk (2006), the insights from this research identified links between various stages of information use, communication and tacit and non-tacit knowledge and the construction of organisational knowledge and memory. There were two strands of organisational memory; the first was related to organisational knowledge, and the second was related to organisational practice knowledge.

\textsuperscript{87} The national law enforcement data service is a national project (in progress since 2016). The goal of NLEDS is to merge data currently held on the PNC and the PND. The outcome should be a single point of search and access to integrated national intelligence and criminal records. The service is also expected to host a national missing persons register and enable intelligence image sharing and data alerts including access to immigration data and automatic vehicle registration plate recognition data.
14.5.1 Organisational knowledge

Organisational knowledge at the participant police forces was realised through the management of tacit information to support three police work processes related to mitigating risk in the immediate term, ongoing term and to meet wider policing goals.

1. The first work process is the mitigation of immediate risk or imminent harm through risk prediction and decision making as outlined by Colliers et al., (2004) involving interpreting new information and or exploiting existing intelligence to inform immediate police response and intervention (Collier et al., 2004) and short term investigation. This process is predicated on cyclic application of the national decision model engaging purposeful tasks that support the wider application of the police force national intelligence model practices.

2. The second work process is the mitigation of ongoing risk in the short and long term during the longer term investigations of crime and planning of police operations described by Roycroft (2015). This process is dependent on exploitation of knowledge arising from the first work purpose. It is also dependent on the outcomes of national intelligence model practices, iterative application of the national decision model.

3. The third work process was depended on the information and knowledge arising from the first two work purposes, relevant for managing broader force wide risks through efficient exploitation where relevant. This process was dependent on the compliance of the various workstreams related to the first two work processes with respect to the national intelligence model practices at the police force(s).

According to participants perspectives, the three processes involve cyclic application of the national decision model (John and Maguire, 2003) to a plethora of policing issues and responsibilities in context of the police force’s intelligence led policing strategy (Burcher and Whelan, 2019) enabling the police force leaders to predict threats to police capacity to satisfy demand, risks within the communities policed and make higher level decisions and provide guidance for risk prevention, harm reduction and interventions to contain threats and prevent crime.
14.5.2 Organisational practice knowledge

The second type of organisational memory was practice knowledge, related to know how and experience of the job and experience acquired through continued service and familiarisation with the locality. This included experience related to a broader understanding of work within sub-systems and the whole organisation. This knowledge varied between officers and the more knowledgeable officers often had more years of experience and or were in supervisory positions. Those with the broadest local and practice knowledge were in intermediary positions, having not long been out of the frontline, but now working in more administrative and managerial roles.

There was no specified or apparent technological or documented means of transferring this knowledge. As a result, officers were constrained to learning from those with more experience if they had an opportunity to be supervised by them. There was however a mechanism for sharing expertise of this nature by communicating with one another which some junior officers took advantage of. Overall, using this approach did not seem to be favoured by the younger officers, keen to demonstrate their capacity to make decisions on their own, however there was some form of failsafe in that sergeants could hear radio chatter and intercede or intervene and officers would often check in with the control room supervised by an experienced police inspector when they responded to incidents or set about investigating reported crime or harm.

14.5.3 Innovating with knowledge - humans, algorithms, and data

This thesis demonstrates that police information and knowledge management comprises of interdependent sub-strands of work and sub-systems of coordinated action highlighting and characterising the varied ways in which information is gathered by police. (Pearson and Rowe, 2020a) highlight the links between risk decision making and decision making information that is recorded by police officers and their execution of discretion with regard
to policing powers in intervention and response roles which this thesis argues is relevant to the way exploitation of police data is viewed. This research reinforces the role of the police officers in shaping the way information and knowledge are interpreted and constructed. It also characterises the positioning of response and intervention police officers as a source of information relevant for machine learning and data exploitation for the purposes of risk decision making. Furthermore, it was evident that their exercise of discretion, meaning making and level of expertise influenced how and whether information was recorded.

This research found that adequacy and quality of information was important to the police forces. Additionally, the core internal concerns raised regarding operational officers use of information systems by analysts were related to data quality, reinforcing previous discussions by Babuta et al. (2018) and relevant when the contexts of machine learning and algorithmic computations are considered (Benbouzid, 2019).

Of note, during this research, the participant forces demonstrated awareness of the importance of data quality and wariness regarding the capacity for algorithmic tools to apply the context specific know how and local knowledge they had when making risk based decisions. Beyond this, they also showed inclination toward data integrity by implementing organisational level solutions to their data quality concerns to support their analysts work.

Operational police officers were concerned about losing trust within communities and devising practical solutions based on local knowledge including fears that their negative experiences with technologies was becoming a trend that could frustrate their efforts to improve. Operational leads on the other hand raised mirrored these concerns and expressed valid concerns about their current technologies in the context of information systems development, deployment, and use/exploitation of information. They were collectively cautious of algorithmic exploitation technologies with inexplicable advanced functionalities in alignment with Sandhu and Fussey (2020) including fears of the implications of these on
their resources and demand levels. They were generally, accepting that it is difficult and somewhat unlikely police technologies could match pace with those in the private sector or available for public use. Overall, they indicated simple wishes, desiring funding, and capacity to benefit from reliable bespoke tools structured around their processes, procedures, and legislative responsibilities instead of making do with out of the box solutions that are costly, dated and limited such that they constrain ways of working.

Given what is known that there is a history of scapegoating within police reform, driving police forces and law makers to resort to tackling issues within sub-systems by selecting single problems with a ‘low hanging fruit’ approach (Lum, 2021) or “scapegoating” and or castigating one or more individuals (Schafer et al., 2007), it was interesting to note that frontline operational officers felt wary of the use of algorithmic tools. They acknowledged there is potential for computational and algorithmic tools to support and expedite risk decision making but this was not without misgivings given widespread ethical concerns about datafication (Veale et al., 2018; Shapiro, 2019; Meijer and Wessels, 2019). In particular, they were concerned algorithmic tools would displace local knowledge and place community relations at risk aligned with the insights shared by Shapiro (2019). They were also concerned about ability to execute discretionary judgement much in the same way as analysts who indicated their preference for careful data cross checking by hand over automated tools.

Senior officers on the other hand expressed mixed views about algorithmic tools and technologies. Some of their views resonated with the concerns discussed by GLA (2013) regarding limiting costs and pressure on existing resourcing. Other concerns that gave rise to scepticism about the use of algorithmic tools related to explainability. They recognised the scope for the use of computational tools that could improve their ability to consolidate and exploit local knowledge efficiently. They also presented plausible explanations about the need to do more for communities by engaging with local and regional data meaningfully.
Rather than reinforce the notion that their systems were too sophisticated for outsiders to understand, they expressed frankness and openness and were genuinely interested in how those in more hands-on roles were coping with technologies. They also openly admitted to being aware of the difficulties regarding changing systems and they expressed understanding and took responsibility for the laboured journey to adopting and implementing these systems given they were not as empowered as they could have been. Regarding the way forward, they expressed pragmatism when considering the external pressures to innovate, and various reform policies such as those highlighted by Kearns and Muir (2019) that tout technologies as the overarching solution to reform and professionalise the police.

Given the findings of this research, this thesis argues that policies that highlight technologies as a broad solution for fixing problems present various concerns some of which are highlighted by (Fibitch and Hopkins, 2017; Lum, 2021). Innes (2011) and Jenkins et al., (2011). The insights from this research align with their assertions about the work of policing and the police organisation, in that it is complex and evolving such that reform cannot be driven by innovation alone. Additionally, the insights of this research showed much in the same way as these authors that the social nature of policing and the involutivity of politically directed police reform, particularly those that promote data exploitation as a solution complicate policing. Furthermore, the emergence of policies that advocate the use of automated data exploitation present critical sociotechnical concerns in the context of responsibilities, roles and the job of policing as discussed by Innes (2011) and (Jenkins et al., 2011) complicating the process of continuous improvement and preventing comprehensive changes and reform in policing.

Lum (2021) in her US centric discussion about challenges to police reform also highlight the assertions this thesis makes. In her discussion, she highlights the inter-dependencies highlighted through elicitation of work practices and information and communication cycles at the participant police forces in this research. She describes the interlocked nature of these
sub-systems and confirms as this research in England found, that because the sub-systems are highly interdependent, changing or reforming one sub-system is challenging in the absence of a realignment of all the other sub-systems. Additionally, reform can only circumvent these challenges if each sub-system is adjusted commensurate with changes in another.

When considered, persistently diminishing resources (Home Office, 2019) alongside increasingly diverse public needs (APCC and NPCC, 2016; College of Policing, 2020) and persistent demands to respond to crime are important for policing. As a result, policy led demands and changes that do not include an understanding of the police organisation, or harness the concerns of the police workforce adequately, simply move problems along rather than address problems. This is particularly relevant in the context of information and its use and exploitation, given that the fulfilment of policing duty is increasingly dependent on the use of information systems and technologies.

14.5.4 Organisation memory in the present – toward the Makovian organisation

Organisational memory in policing is a drift away from the traditional perspectives of knowledge management using historical knowledge from its past activities to inform current and future practices. It inclines toward the Makovian organisation described by Klein et al., (2007) where the knowledge that guides the current and future practices within the organisation is informed and shaped by the knowledge integrated in current activities and current state of the organisation. In this way as knowledge changes, the activities of the organisation change and knowledge that becomes irrelevant to its activity cycles is obsoleted. In this stead, the police forces demonstrated that they predominantly require and depend upon current information to manage critical events, make force-wide resourcing and operational decisions, and maintain communications with the public.
This approach enables adequate operational police response to harms and crimes while the practices in relation to communicating risk and harms enable business leaders to monitor and review the ongoing capacity for the police to satisfy police demand. It also enables decision making and coordination of directions that enable enabling response officers and investigation departments to use their practice knowledge to manage and ameliorate immediate risk, prevent ongoing harm and make immediate decisions that prevent further harm and crime (Klein et al., 2007).

14.5.5 Organisational knowledge – Toward harnessing knowledge of doing policing

The management of police practice knowledge was aligned to a more traditional purposing of knowledge reported by Dalkir (2005), who discusses importance of storing tacit knowledge in the same way as non-tacit knowledge such as data from traditional forms and electronic documents. Dalkir also highlights the need for organisational knowledge to include information from content experts, described as the ‘people’ who have valuable tacit knowledge of policing. Here knowledge is commodified, the currency that enables police leaders’ decisions on a day to day basis as described by (Klein et al., 2007).

There is value in the policing organisations’ ad hoc Makovian practices, however, it is vital for the police forces to advance toward standardised recording practices that enable all police department supervisors to review and comment on the daily summaries from departments they have interdependencies with. The current practices for management of information of note or of critical value at the police forces differed from department to department and there was no central repository that could support back casting (Dalkir, 2005; Klein et al., 2007).

There are systems which offer some capabilities such as the one described by Grubin et al (2001) incorporating a knowledge management system that enables crime data entry and comparison with national or local databases demonstrating the potential to adopt technologies for the purpose of managing organisational knowledge (Grubin et al., 2001). In
this respect, exploring means of maintaining daily critical crime data within a repository that is shared, updatable and reviewable by all departments could be made to this to centralise the collation of this information.

This approach supports the risk-based nature of the policing organisation and the overarching need for accountability. In this respect, the creation of daily departmental reports should use a dedicated and central repository that enables supervisors to flag and comment on operational lessons learned. Leaders and supervisors should have the capacity to review historical information and learn from past practices and analysts would be better informed about specific critical incidents. This would present the police leaders with a means of reviewing information and recording their views and decisions within the same system rather than having to read different briefing sheets on a daily basis. It would also segment critical incident information for better analysis and review of operational incidents of note.

14.5.6 Organisational knowledge – maintaining local data for long term planning

The police forces also inclined toward some traditional knowledge management practices, using, and managing information on an ongoing basis for short- and long-term use. This was characterised by processes linked to record keeping and maintaining a repository that helped them to understand the people, places, and incidents in the communities they serve. It also included crime and intelligence information and knowledge for long term planning.

Practices regarding this varied, however the tendency was to record information on the basis of whether it could enhance knowledge about a person or place or object of interest or concern to the police. This included information that highlighted vulnerability to harm and or exacerbated the risk of harm to an individual or in a specific place. Additionally, information was also recorded if it enables support investigation of crime in future or if it could provide a means of supporting individuals through signposting or statutory referrals to other organisations with their consent.
14.5.7 Bounding two domains – conceptualising police organisational memory

Klein et al., (2007) explore the capacity for organisational memory to inhibit and constrain an organisation from effective operations highlighting the benefits of organisational memory arguing for recognition of the interdependency between organisational learning and organisational knowledge. They propose a constructivist framework that motivates planning based on the current state of the organisation drawing on the four discourses of knowledge management (include the neo-functionalist, the critical, dialogic and constructivist.).

These discourses were proposed by Schultze and Stabell (2004) alongside their presentation of a knowledge management approach based on two dimensions that contrast ontological subjectivity and objectivity with socially ordered radical change and regulation giving rise to the four discourses. In their assertions, they describe duality as a constructivist approach that arises from asking ‘when’ and ‘what’ is knowledge. (Organisational) knowledge is viewed as emergent, cyclic, constantly shaped and situated in practice in a web of action and useability. Dualism on the other hand inclines toward pragmatism, taking a deterministic approach to (organisational) knowledge and viewing it as one dimensional. This involves asking either ‘when’ or ‘what’ is knowledge (i.e. either/or ), embracing dichotomies and rejecting contradictions (Schultze and Stabell, 2004).

It is conceivable that an organisation might adopt a Markovian approach to knowledge, while engaging in traditional practices to satisfy other purposes. In the case of policing, the need to maintain readiness to respond to incidents as they emerge is critical, however, their response to incidents also requires an understanding, know how as it were that supports their initial appraisal. Beyond that, given the need for accountable practice, they also need a means of retaining knowledge about incidents that happened in the past.
In contrast to Poe et al (2021) who set out a taxonomic differentiation between intelligence management and knowledge management, this thesis agrees with the assertions made by Klein et al., (2007) and Schultze and Stabell (2004) regarding organisational memory. Despite the limited capture of tacit knowledge using ICTs, there are benefits to be derived from implementing systems that capture local know how in conjunction with crime, incident and contact information realised in operational policing (Alavi and Leidner, 2001) with enhanced benefits derived by the use of ICTs.

In the case of policing, combining the Makovian approach and traditional approach acknowledges the uniqueness of police needs and purposes including the sense and meaning making of people who process information and apply their knowledge. It also supports a transformative alignment with the national intelligence model. Additionally, it provides police forces with a means developing working policies based on knowledge.

14.5.8 Conclusion to this chapter

The asymmetric nature of information (Caudle et al., 1991a) is amplified in policing due to the social organisation of policing, impacting on the expected usage of technology by lower level staff. Although there have been and continue to be benefits from the use of technologies for the keeping of records to promote safety, prevention of crime (Chan, 2001a; Davis, 2015; Koper et al., 2015) it is clear that despite the most marked problems of being a public service agency are affected by economic fluctuations and political change as highlighted throughout this thesis.

The police organisation is information dependent, and information driven as highlighted in the literature, however at core of this information dependency, context is the driver for appropriate interpretation of risk and decision making and context defines the use of information and its storage on information systems. The officers demonstrated varying levels of understanding of big data and expressed caution about incorporating algorithmic tools.
This view was shared and highlighted by analysts who indicated their duty of care and ethical regard included evaluating shifts in behaviour, assessing and confirming/verifying knowledge and intelligence and careful review to ensure they did not simply automatically generate risk lists and risk knowledge. Tactical and specialist teams on the other hand expressed a desire to see/discover algorithmic tools that could accurately predict future risks or support weighting of existing risks. More senior police officers were highly interested in the scope for innovative computation of information to improve efficiency of operational response, however they expressed marked reservations about the explainability of algorithms and the potential for algorithmic tools to impact on community relations and perceptions of police legitimacy.

In this fast paced, dynamic, and unpredictable environment, marked with stressors and increased risk for police officers, the criticality of tools that support and sustain expedient actions is important. This is relevant for the immediate police response and the management of the broader contexts of risk using intelligence led approaches in the short, median, and long term. Despite the problems highlighted within the insights of this research and the worrying concerns highlighted through SSM, rather than conclude that police have still not got it right, this thesis presents an alternative argument as follows.

State of the art technologies are not economical, this much is evident. In view of this, despite the various problems that have been highlighted about and around information systems, participants acknowledged their usefulness. The factors affecting their continued use and acceptance were related in part to practices constrained by legislation and policy and in part to the power impositions presented by the nature of service delivery from software service providers.

In Schafer’s volume on the future or policing, Cowper (2020) asserts the continued criticality of technological tools, arguing that the benefits to be realised from their future use in policing
will be determined by the way they are used in policing (Schafer et al., 2007). Procurement of technologies for big and complex organisations with diverse needs often include costs that exceed that of the average consumer’s spend on the same piece of technology. In the case of a consumer, the turnaround of use and embrace of newer technology is often rewarding. In the case of policing, the acceptance of new information systems has rewarded them by pushing toward compliance with policies and satisfaction of scrutiny, however behind the scenes, the realities of the use of their current information systems lead to inefficiencies in the delivery of service and strain on their ability to meet demand. This has implications for their legitimacy and creates avenues for continued criticisms. The interactions between persons and technologies are of course not constrained to the information systems, the same principles apply to communication technologies.

The persistent fear of going wrong or doing wrong has introduced and continues to sustain a measure of risk aversion in the policing environment. Because the workplace is heavily criticised for the enactment of negative cultures and practices, within which police officers and their leaders are rarely lauded for making do and coping, the inclination is to avoid anything that might sound or look wrong. Instead, they have resorted to managing and coping because despite learning and adopting measures to remedy past mistakes and prevent new ones. Additionally, despite suggestions that use of technologies should improve their work, the scope of the technological tools they can use is limited to what they can fund. Once these technologies such as information systems are embedded, decisions about their continued use are hard to change.
Chapter 15: Conclusion

15.1 Introduction

In the United Kingdom, the police are the most prominent public facing constituted agency with delegated powers to uphold and enforce the law, prevent civil disorder and crime, protect the public and their property; and ensure the health and safety of citizens. The introductory chapter of this thesis highlights what has been said about this and the culture of policing, including the efficiency, leadership, organisational problems and sociological influences and pathologies of policing in the literature. This informed the research objective while the subsequent literature review highlighted the paucity and limitations of existing research into police practice in the context of information, communication and information systems which underpin the risk management and decision making.

The first two chapters reinforce the need for researchers outside political and police organisations to play a role and by proxy, take responsibility for investigating the work of policing. The review of existing work and the field of research supported the refinement of research objectives that focus on improving understanding of the world of policing. It also enabled refinement of the research questions and development of a research approach that recognised the need for in depth understanding of policing. The resultant research was then focussed on what could improve and builds on existing literature.

Chapters 3 and 4 outline the philosophical approach taken to the research including the strategies adopted when conducting field work and analysis. The philosophical approach informed the methods and pluralistic analysis of the research providing structure to the research process.

Chapter 5 builds on the previous four chapters, extending the outline of the research methodology in chapter 4, providing an account of my practice as a researcher spanning my experiences regarding access and gatekeeping. It also details experiences of fieldwork,
providing insight into the scope of fieldwork, context of the research and the rigors of the approach taken to the research. Chapter 6 provides insight into the organisations being researched, highlighting the rationale behind researching and reporting on the participant forces together. The chapter also enhances understanding of the organisation’s collaborative practices with respect to their ICTs.

Chapters 7 through to 12 present the ethnographic insights highlighting the contributions of this thesis to the body of existing work on policing, providing new insights into modern police communication practices. The insights also highlight the sociotechnical and interdependent flow and flux of information within the police organisation, updating the existing literature on police information and communication flows.

Chapter 13 provides a summary of soft systems methodology analysis in two selected cases. This includes a brief introduction to three other problematic situations, highlighting the scope for the use of SSM in complex organisations such as police forces.

The discussion in chapter 14 highlights the complex and interdependent nature of the processes and procedures in different areas of policing with a consideration for the internal and external causations and influences that drive current practices. It also advances an epistemology of the police information and communication practices, defining police practices and providing insight into police meaning making in their networked and highly interdependent sociotechnical system. It highlights contributions to the understanding of use of information, adoption, and implementation of information systems, use and adoption of communication technologies and the dynamics of police knowledge at these two police forces. This includes a discussion of insights that represent an enhancement of the existing knowledge around police knowledge and organisational memory.

This thesis argues that the sub-systems in policing are not only interdependent on one another, but that there is a bigger concern. The mechanisms and instruments that these
interdependent sub-systems require in order to maintain alignment with modern demands such as technologies have been the subject of significant and continued changes over time.

Specifically, in the case of technologies and information systems, the police forces are noted as having limited sway over some aspects of the ICTs they use such as communication radios and national databases. They are therefore persistently coping with the longer-term effect of external influences on the scope of information systems they use. Some of these constraints relate to policy, others have firm footing in political influence and yet others relate to cooperative working practices across other public services.

Reform demands have been helpful in specifying broad problems, motivating changes that are intended to improve policing, but this thesis demonstrates that many policies and demands for reform are ambiguous, politically worded to drive public sentiment and rarely examined from a feasibility or practical perspective. In this sociotechnical account of the business of managing risk in an information driven environment, it was evident that there is limited research that promotes understanding of policing processes and activities. In particular, while existing research provides a valuable framing for understanding specific concerns and or areas of work, research efforts that discuss the intertwining of processes and activities and the consequential use of information and use of information and communication systems are thin on contextualising real-world practice. It is also evident that the characterisations this thesis contributes enable contextual understanding.

Furthermore, despite criticisms, the police forces are persistently constructing and reconstructing mechanisms to cope with and manage the effects of situations which influence or impact on their ICTs capabilities, capacity, and overall service delivery. In much the same way as Loader (2021) in his critical appraisal of policy making predicated upon Peelian principles that date back to 1829, this thesis argues for a policy and research level understanding and acknowledgment of police practices and their inextricable use of
information and associated information and communication technology as a precursor for policy making. It further argues that the understanding of the rationales that support current police communication practices and the context of organisational knowledge and practice knowledge in the context of their risk and decision-making practices are highly important for policy making.

Policy recommendations and legislative enactments should be accompanied by a rainbow approach instead of the black and white approach. All the dimensions of the policing organisation should be carefully weighted using information available to lawmakers about policing capacities, funding, and demand. Changes to any one aspect of policing should be considered in the light of the entire organisation, given that this research shows that the policing organisation is not a system but a system with significant dynamically structured sub-systems all of which are interdependent.

Reformative demands should acknowledge the need to expedite changes, but also include realistic outlines of how and when changes should occur. In particular, where technological innovations are planned for police organisations including police information systems, police databases such as the police national database project and police communications such as the emergency services communication network, the police forces should be enabled a stronger consultative power and stakeholdership while the policy makers should think forward and outward, recognising that innovative technologies often do not become cheaper in the long term.

Given the increased dependency on the private sector for technological solutions, there is a clear need for policies to be strengthened around the development of software for police use. Providers of software should be held to a high standard and held accountable in meaningful ways for software failures and problems and underlying policies should incorporate awareness of the long-term needs associated with procuring technological expertise.
Policy making then, stands to be informed by recognising the following understanding arising from this research. The first is the interlinking and interdependent nature of the systems and subsystems within the policing organisation. The second is the relevance and importance of contextual understanding of policing use of information, communication and information systems use in the context of risk predictions and decision making and the way it influences cultures, perspectives, and overall performance. The final, that the police organisation as a tightly bound, highly interdependent sociotechnical system with multiple sub-systems engaged in multiple information and communication sub-cycles.

### 15.1.1 The interdependent and interlinked police organisation

The insights of this research gave rise to an improved understanding of the nature of the police organisation with attention to information and communication cycles and sub cycles. These insights support policy led understandings of note including the following:

1. The development of whole system changes and transformations requires an evaluation of each of the inter-dependencies within the sociotechnical system.
2. The impact of changes in each sub-system on each of the other sub-systems and subsequently on the whole socio-technical system should be a fundamental part of policy making.
3. The effect of policy change on each sub-system and the information and communication sub-cycles is a contingent aspect of policy making.
4. Policy should rationalise potential for desirable or undesirable effects on the whole system before policies are enacted.
5. Policy should incorporate specificity where the sociotechnical system is required to cooperate or collaborate with agents and or systems external to it with respect to roles, responsibilities, costs, and tasks.
6. That policies should incorporate a clear plan for managing their impact on the practices in the sociotechnical system which are discovered to have influence on the construction of practices related to information and information systems
7. That policy making should engage with the sociotechnical system to gain insight and understanding of their practices and incorporate outlines that clarify their understanding of the changes they propose on the sociotechnical system in which practices are enacted
15.1.2 Context and the sociotechnical police organisation

Another key contribution of this research was the promotion of contextual understanding of police practices and the police organisation with respect to risk, harm and decision making as follows:

1. The context of information and the context of use of information systems in the police sociotechnical system are highly interlinked
2. The context of the management of risk and harm is inextricably linked to the context of information, scope, the context of communication and the sufficiency of information systems.
3. The overall context of decision making is dependent on all of these and highly influenced the meaning making expressed through scope of practice knowledge and exploitation of available organisational knowledge.
4. The sense making and meaning making including embedded cultures of individuals working collectively and interdependently in this context is influential and driven by all these factors in context.
5. The expressed understanding of this context provides police officers with an opportunity to balance power inequalities enacted by their dependence on voluntary and statutory informants.
6. This balancing informs evaluation of harm, decision making about action or inaction at the lower end of the policing sociotechnical system and informed short- and long-term strategic decision making at the upper end.

These two conceptualisations advance an understanding of policing work and support the rationalisation of transformation within the policing organisations. Without knowing and visualising the real-world experiences that shape collective cultures and individual sense making and recognising the sociotechnical nature of the police organisations in context, policies fail and reform falters. As such the impact of directives and the associated bureaucracy from those external to policing is a significant contributory factor for many of the concerns raised about ICTs in policing.
Furthermore, given the chronology of demands for multiple changes to technological provisions in policing in small periods of time in the last decade alone, it is relevant to consider whether the sociotechnical system conceptualised in this research has been afforded time to change, adopt new systems or approaches and embed these; fulfilling adaptation and adoption before having to change again. Although it could also be rationally argued that police reform including driving the adoption of innovative practices that involve harnessing ICTs is a necessary outcome of scrutiny and necessary for the public good. It is also important to recognise that repeated changes have created and continue to create stress lines within the sociotechnical policing organisation which spread into the delivery of frontline policing.

This research also demonstrated that the more advanced and experimental or novel a technology is, the higher the likelihood that the technology will be plagued with deficiencies when deployed in a high demand, time critical environment. Additionally, it was apparent that newer technologies come with a higher likelihood for sustained and frequent updates, upgrades, enhancements, and adjustments to ensure the systems provide continuous and uninterrupted access, remaining impermeable to failures. However, given the scope to ameliorate these problems quicker if the capacity and funding is present, it is important to protect policing from these problems by evaluating the policies around the servicing and funding of technologies.

To give an analogy it would not be acceptable to go into a clinical setting to have a simple procedure involving the insertion of simple dissolving stitches only to find that the stitches require permanent daily visits to the hospital to keep them in place. In the case of policing, the only way to ensure continued access to information systems, is through being shackled to software service providers who bundle services and maintain a long relationship that involves the disbursement of funds despite the inadequacies of their services, highlighting a flaw. Given that if the right funding was in place and good networks were retained, there
would have been scope to develop a unified information system, centrally owned by all police forces and supported by local ICTs expertise as opposed to the ‘what can we afford’ procurements dilemma police forces contend with if the findings of this research were taken into account.

The fear of negative consequences of failing to comply with government policies including associated pressures of reform demands have clearly driven many of the approaches taken to the adoption of technologies in policing. The blame cannot be put at the door of policing alone given the dredges of politicisation of policing remain. The ambiguity of certain policies have also shaped and directed the way policing developed up until the turn of the last century. It is important that police forces continue to work to develop innovatively and improve and strengthen their digital capability to serve the interests of citizens ethical, however, policy makers must take some responsibility by being honest with the public about the conditions and nature of the work of policing.

This research being concerned with the understanding of police information and information and communication systems. The insights support others that assert continued improvement of policing is important, valuable, and necessary. Where it concerned use of advanced and innovative tools, it waws evident that the neo-liberalistic approach to policing and austere policing models including limited funding to critical areas preclude use of high-end approaches that utilise machine learning and algorithmic computation as a norm. Despite the interest in algorithmic tools, rational reservations and caution was expressed as to the sustainability, explainability and risks associated with engaging in algorithmic processes for core operational duties. As the insights of this research also demonstrate, police officers recognised the value of innovative change. This included appreciating the positive implications of improvements to technological capacity, information use and sharing and operational information management practices that harness innovation. However, policing is largely underfunded with emphasis on the reduction of waste and delivery of value.
Although police leaders are open and willing to enable and engage with expertise (as was clear during this research), they can only take expertise they can afford, the continued cuts to police funding therefore limit the capacity for police forces to move with the pace of innovation and engage with better ICTs.

15.2 Revisiting research questions

15.2.1 The role of police officers regarding ICTs and information use

Core Question: How do police officers understand their role with respect to ICTs when collecting, storing, and exploiting information for risk assessment and decision-making?

The insights in chapters 7, 8 and 9 outline police communication and use of information including the context of information and communication cycles with respect to risk assessment and decision making. This thesis provides a key contribution to knowledge by enhancing existing understanding of police work, explaining and characterising police communication and information use practices.

The work of policing is enabled and facilitated by ICTs. Police officers at Bedfordshire and Cambridgeshire expressed their understanding of their role of risk assessment and decision making in five ways. As evaluators, administrative workers, knowledge workers, decision makers, and risk-decision-information reviewers.

The evaluation role spanned two groups: those who perform frontline operational response/intervention, investigatory and tactical roles and those who perform leadership operational roles. The administrative working, knowledge working, decision making, and risk decision information reviewing conducted by the two groups differed aligning to the context and purpose of their duties.

Frontline, tactical, and investigatory police officers performed their evaluation role by identifying the value of information and its relevance in the context of assessing risk,
preventing harm, and managing risk. This involved administrative duties when researching, acquiring recording, and reviewing information and knowledge and knowledge work, contributing to locally held intelligence, and providing background information to support continuation of investigations.

The process of collecting information was also linked to decision making which they understood to have an influence on the work of other departments. Their decisions were guided by evaluation of existing organisational knowledge about places, people and incident supported by practice knowledge about their job which required them to take legislative or policy led actions. They openly expressed the unique nature of this as it was not a single linear process, it was a cyclic, iterative, and repeated practice driven by practice knowledge involving evaluation, identification, recording where relevant and dissipation where relevant.

Senior police officers in operational roles performed their evaluation role differently. They were engaged in top level decision making and dependent on the evaluations of the frontline police officers who mediate primary information management and sense making. Senior police officers used their practice knowledge to review information in three ways. The first was to evaluate police demand, risk and harm levels and plan day to day, the second was to evaluate the same and plan for the short term future. The third was to draw on the capacity to exploit information by tasking analysts in order to understand their demand and crime profile and support their decisions to plan for the long term future.

Both senior and junior police officers understood their role as administrative workers, managing, sharing, and communicating information, and as knowledge workers contributing to and supporting the interdependencies within the organisation by recording, documenting, and storing information and applying their knowledge of practicing police in this process. They also understood their role as decision makers having influence on outcomes for
citizens, victims, and impact on the interdependent work in other departments and as reviewers actively and consequentially learning, reviewing, and extracting information to support their decision making in their roles.

At the nexus of these roles, they took on, they understood and recognised the value of technologies that facilitate communication, recording of information and evidence, storage and management of intelligence, the conduct of investigations and the management of detainees. They considered the technologies they use to be vital for their safety, enabling connectivity and communication, necessary for the effectiveness of their duties, providing them with a means of accounting for their actions and decisions and relevant to their work in the context of public expectations such as accountability. They also expressed understanding of the need to communicate with one another, cooperate with other agencies and interact with members of the public using technologies.

15.2.2 Sub-strands

15.2.2.1 Implications of information & communication for policing work

Sub question a: What are police officers’ views on the implications of information and communication in the context of risk assessment and decision-making?

Chapters 7 through 9 and 12 include contributions that improve current understanding of the context and nature of information and communication in policing. Information was considered critical to the work of policing. Furthermore, police officers indicated that the value of knowledge of policing practices and the extent of their experience of evaluating information were important and critical as was the capacity to make sense of the context in which information was received or provided. Police officers and police staff expressed most of their sense and meaning making through communication. They indicated it was important in their work to build rapport in their interactions with citizens, engaging in cognitive
practices to discern, encourage disclosure of vital or valuable information that would enable the determination of ongoing or impending risk and or provide insight into ongoing or potential risk of harm. In investigatory capacities, information was central to the investigations conducted and relevant to the realisation of prosecutions.

The officers were dependent on a range of communication approaches and communication tools some of which also served the purpose of evidence collection in their duties such as telephones and the airwave radio. They practiced person to person communication with one another and communicated through messages with colleagues in other areas of work who were not co-located with them. Their administrative work, recording information, case building, and record updating was a means of communicating with other staff in other work areas contributing to organisational knowledge as a whole.

They viewed these communications about risk prediction and decision making as having varied relevancy. For instance, communication of information related to summaries of critical incidents was of value to senior police officers and police leaders who found it meaningful and relevant for resource management. For others it was working information about risk enabling decisions based on knowledge sharing giving rise to improved organisational knowledge. Junior officers, however, did not see information as relevant in the context of the type of work they do and the more immediate type of risks and harms they make decisions about.

Police briefings in sub-systems within the police organisation provided a means of exchange of information and intelligence and supported a sharing of practice experience providing police officers with opportunities to socialise and discuss their experiences and local knowledge. They considered this useful and vital in their work. Additionally, this provided a means for supervisors to deliver distillations of critical intelligence needs and requests or tasks, which motivated officers encouraging them to pay attention while out on the beat.
Business leaders did not attend these briefings, not being engaged in hands on practice of frontline policing activities.

Information sharing was generally considered important for determining the best approaches to risks and potential harm. The contributions to existing understanding outlined in chapters 8, 9 and 11 including the SSM analysis in chapter 13 demonstrate the criticality of information sharing for operational work and strategic policing goals. For business leaders, sharing information supported the wider goal of socialisation in their sociotechnical organisation, enabling connectedness with the communities they police, maintaining transparency and representatively expressing accountability. It also enabled brainstorming and consensus on critical policing issues.

15.2.2.2 Exploitation of information using technologies and algorithmic tools

Sub question b: How do police officers feel about the exploitation of information using technologies and algorithmic tools for risk prediction and decision-making?

Business leaders expressed an interest in the scope to exploit information using technologies and varied concerns about the use of algorithmic tools. The same was true of junior police officers in frontline policing roles, however for officers in investigatory and tactical roles, the possibilities to exploit information using algorithmic tools was of significant interest. Of note, there were varied perceptions about what algorithmic tools were with some understanding them as artificial intelligence tools and yet others viewing them as enhanced data sorting and or processing tools.

Chapter 7 contributes to contextual understanding of the nature of information exploitation to support crime response, Chapter 8 characterises the flow of information and its relevance to policing while chapter 9 highlights the value of police knowledge in the context of information and practice knowledge. These are relevant in the context of innovative data exploitation and for the work of analysts at the police forces who indicated that the
overarching costs of technologies that enable algorithmic and or big data exploitation came at a high cost.

Technologies with capacity to perform metric analyses and or manipulate big data were in use, but analysts indicated their work was still highly dependent on checks by hand to exclude errors and mistakes. This was also necessary to compensate for the limitations of the software they had access to. Furthermore, they indicated that the use of technologies was limited by quality of data, scope of exploitation permitted within the legislative guidance and police policies. Business leaders on the other hand were more concerned with the conciseness, speed, and timeliness of analytical outputs.

Overall, the police officers and staff presented shared concerns about the ways in which algorithmic tools could damage public relations or promote errors with social implications. They also expressed a lack of trust in algorithms asserting that their human analysis provides scope to explain, rationalise and confer about their risk decisions and decisions.

15.2.2.3 The future of data use for risk assessments and risk decision making

Sub question c: What are the concerns about the future of data use for identifying, assessing, or detecting risk and making decisions from the perspectives of police officers, and how will this affect their practices?

Chapters 7 through to 11 provide various perspectives that constitute contributions to the understanding of police views about data use. Uncertainty and rapid change alongside ability to manage information appropriately were at the core of future police concerns regarding data use. They linked the future of data use to their concerns about algorithmic tools expressing disillusionment about the slow pace of movement to innovative and more advanced technologies. They reinforced their trust in existing stable and reliable data capture and management tools and felt that immediate value would be better served by improving
body worn cameras, phones, and information systems to improve capacity to record and access data quickly.

Additionally, they also expressed concerns that related to their awareness of advancements in society at large, citing the increased demand for policing response to crimes that were either digitally enabled or conducted digitally. They admitted that the changes to the domestic violence legislation for instance had paved the way for them to begin to gather and use information to classify and record technologically enabled incidents that were previously not provided for in law.

For business leaders, rising costs of accessing expertise, staff retention and costs of technologies were their key concerns. They were also concerned about and interested in ways in which they could diversify their work force, believing that the diversity and representativeness of their workforces as they go into the future would be of benefit over technologies when communicating and interacting with the public and other stakeholders about risk and decision making.

15.2.2.4 The impact of COVID-19 on information and IS systems use

Sub question d: What impact did the global COVID-19 pandemic have on the use of information and information systems for risk predictions and decision making at the police forces?

COVID-19 as witnessed had an initial demoralising impact on policing and it highlighted the lack of interest in protecting the police work force from harm increasing risk levels and altering ways of working. Of note, the provisions for protective personal equipment were inadequate and most police officers had to share equipment such as splash masks and provide their own safety equipment. Chapter 12 highlights contributions to the existing body of research around the impact of the pandemic on policing. The COVID response in the context of use of information and information systems was characterised by learning on the job,
conferring, and seeking advice from one another, relying on practice knowledge to structure actions.

Police practices were challenged by quick changes to legislation marked by difficulties responding to and managing risks in this period due to the limitations lockdown had on potential informants. Safety logistics were limited, and the level of support police were expected to provide involved increased demand levels and expenditure on technologies in order to respond to and support people who were vulnerable and or at risk of harm.

15.3 Summary of research contributions

As outlined at the start of this thesis, much of the existing research into policing in England has inclined toward the political, sociological, criminological and or organisational and business studies fields. There were some gaps in the existing police information systems research in England and Wales. The most important contribution of this research was therefore the enhancement of existing police informatics endeavours and production of up to date characterisations of policing practices regarding information use, communication and information use practices and characterisation of police information and communication systems.

In the case of Bedfordshire and Hertfordshire police forces, this research provides novel insight into their current practices and cultural behaviours regarding information, communication, and knowledge, including the values they assign to these. This includes characterisations of the processes related to these including the use of information systems for the management of risk, containment of harm and facilitation of police decision making. In particular, the insights elicited through this research improve understanding of hierarchical utility of knowledge, contextualising management of knowledge, providing vital understanding of policing activities and decisions in operational, tactical, and strategic roles.
This research also contributes to the existing epistemology of police informatics, conceptualising information, and communication in the sub-cycles within the police sociotechnical system. It characterises information acquisition and receipt processes, detailing the complex and vital web of information and communication within the sociotechnical system at the police forces contributing to and building on existing research efforts some of which rely on limited detail and or are dated. It characterises the work of modern policing, illustrating processes and providing clarity about the use of information and intelligence for risk predictions and risk decision making, highlighting variations in information use and current scope for exploitation of data using predictive algorithmic methods. It also provides insight into the views of police officers regarding adoption of machine learning and algorithmic tools alongside the factors that currently influence and limit their access to these.

The research has also enabled explanations of the applicability of police information, intelligence, and communication relative to type and scope of decision making in the context of police ranks and roles. Additionally, the characterisation and illustration of information and knowledge flows, highlighting interdependencies within the police organisation demonstrate the importance of organisational and practice knowledge. Regarding existing literature that provide limited explanations for the relationships and influences on use of information, intelligence, communication, and information systems. The findings of this research further improve on these efforts by explaining the importance of the contextual interdependencies that exist with agencies outside the policing organisation, offering explanations of their influence on police actions and processes.

Furthermore, this thesis explains the context and value of intelligence, organisational knowledge and intelligence led policing in relation to various police roles and associated processes. It provides a contextual understanding of the work of those that are concerned with organisational decision making and their contextual engagement with information and
intelligence to inform their strategic decisions and intelligence led policing approaches and explains work roles that are involved in the intelligence led policing practice in their collaborative evaluation processes and the purposeful activities related to the use and exploitation of information (as intelligence) within the police organisation, improving scholarly explorations of intelligence led policing. The use of information systems in policing is also characterised, prioritising the voices of those engaged in their use, highlighting the critical needs information systems meet and purposes they fulfil. Experiences of end users and the underlying issues influencing uptake and embedment are exposed giving insight into the practices around information management. Behavioural responses to inadequacies and problems with information systems in the absence of remedies and alternatives are also highlighted, exposing coping mechanisms and salient effects of problematic information systems implementation.

Of note, this research also provides insight into the cumulative and experienced impact of three policies influenced by political interest in the efficacy of policing. The first is the impact of policy and legislative directives which led to collaborative and cooperative work with other public services. The second was information sharing policies with respect to other public service agencies. The third is enactment of policies and edicts to implement information systems and technologies that support information management and information sharing practices between police forces in line with national policing requirements.

The account of the realities and impact of collaborative and cooperative working and analysed outcomes of two problematic situations involving information sharing and the core information systems in use contribute to the current empirical knowledge on policing. Furthermore, this research provides a foundation for future research into other police forces and their use of information, practice knowledge, organisational knowledge, and information systems in the context of risk prediction and decision making.
15.4 Research Limitations

This research involved extensive work that gave rise to understanding of the police forces as sociotechnical systems. As outlined in this thesis, ethnographies are not without their limitations and criticisms. Although this ethnographic work derives credibility by concentrating on the value of persistent immersion and focussed identification of interrelated, causal, and contextual explanations that account for consequential factors, engaging in member checking throughout; overriding events such as the pandemic and time limitations for this research prevented the inclusion of more participants and limited time spent within some specialist departments. Furthermore, the research was limited to two police forces limiting scope for generalisation of findings.

The outsider-insider researcher role and inevitable subjective perspective is open to positivistic criticism given small sample of just two police forces. These limitations may give rise to concerns about reproducibility or generalisation to the other police forces (37 in total excluding the two participating police forces) in England.

Although extensive characterisation of dynamic variables in the phenomena observed in the wild has been expressed in this work, the adoption of a pluralistic analytical process highlighted as a beneficial approach for visualising extensive data and demonstrating the value of multiple interpretive analytic methods may be considered unorthodox. Additionally, reporting on the instances of Checkland’s soft systems methodology have been curated due to the prevailing policies for producing this work.

Finally, SSM analyses did not include interaction with secondary stakeholders external to the police. This was in part due to time and resource constraints extending to considerations for confidentiality as well as avoiding dilution of field immersion which in itself provided unique extensive access to a ‘hard to study’ group. Additionally, had access and discussion been possible, it which might not have been possible on the same terms with the secondary
stakeholders who were not the subject of this research. Rather, the focus was on the honest accounting of the police participants views and observed experiences given one of the goals of this work was to amplify the voices of those who do the work and tell their stories exemplifying their realities.

Therefore, the outputs of the soft systems methodology are potentially open to a modicum of challenge as the recommendations are reflective of delivering solutions that are sustainable while seeking to hold groups that might impose on policing resources accountable in line with SSM principles. The recommendations may differ should the opportunity to engage the primary and secondary stakeholders on equal footing arise.

Despite these limitations, this thesis reports on a large amount of field immersion in operational police work settings, marked by extensive observations of operational and tactical policing activities including discussions and insights from several leads in various tactical and strategic roles and specialist departments.

15.5 Future work

This research was conducted at two police forces. As the literature indicates, characterisation of modern police practices with attention to developing an understanding of use of information, communication and information systems provides insight that supports policy making and reformatory planning. Extending this research to other police forces will enhance the scope of the findings, increasing generalisability of findings. There is also scope to extend this research for needs elicitation based on current policing requirements.

The findings provided insight into multiple workstreams however the amount of time spent researching specific workstreams was limited due to interruptions due to the pandemic. In line with the arguments made about interdependencies within the policing organisations and in keeping with the interpretive practice approach, future work could involve immersive interviewing and longer immersion within all police sub systems to improve
characterisations and derive more understanding of the values and practices within the police sociotechnical system.

As outlined in this thesis, the soft systems methodology involved multiple stakeholders and interested parties. The viewpoints represented including recommendations of the analytical process are aligned with views gathered from police officers. Future research could improve on the soft systems methodology process by gathering perspectives from the third parties and other external stakeholders involving them in the analytical process.

15.6 Concluding remarks

As this thesis demonstrates, policing involves the cooperation of networked police officers and police staff working cooperatively and interdependently to manage crime and harm. Their work is primarily information dependent; the stimulation of police action and processes were reliant on receipt or acquisition of information and the appropriate distribution to relevant workstreams within subsystems. The resulting police processes were a direct result of communication within and across various sub-systems of work; involving repeated sifting to identify relevant risk factors, harm factors, scope to apply legislative powers and or retention value. This practice of police then involved making contextual decisions to support short- and long-term actions and processes aligned with the prevention of harm and crime while engaging with information systems to facilitate and support their activities.

The use of information systems and associated technologies extended beyond the facilitative to the necessary. In particular, information systems were vital, supporting active and passive communication within the networked police organisations, enabling maintenance of local knowledge, and ensuring compliance with legislation and sustenance of a citizen and victim centric policing service. However, there are difficulties such as the problems with cooperative working and information sharing affecting the continued efficacy of police
demand and crime management. There are also complicated problems related to the ease of use, availability, functionality and continued funding of information systems and technologies driven in the main by influences which lie outside of the policing organisations.

There is also marked strain and inclinations toward persistent enactment of coping strategies in order to comply with policies, bureaucratic impositions, and outcomes of scrutiny. Holding police organisations accountable is vital for the continued improvement of police service and democratic practice, however, it is also important to evaluate the implications of these on the current underfunded police organisation.

These strains are indicative of a need for government to acknowledge and present fair balance to police forces and here this thesis draws inference from the continued funding of potential white elephant projects such as the emergency services communication network project. This is particularly important because when and if the emergency communication network devices roll out (which is doubtful), it is police forces who will fund what central government chooses for them.

This thesis therefore raises important questions and considerations about the way communication and information management tools are implemented. It advances conceptualisations that support understanding of uptake and use of information, and information systems and highlights the underlying communication tools and practices at the police forces. It advances the perceptions police officers have about these including the effect of the use of current systems. It also highlights some of the realities of joint working and information sharing arrangements building on what has been reported by other scholars. Finally, this thesis uncovered the realities of austere policing and enactment of reformative policies contributing to the corpus about potential problems and police reform.

In conclusion, this research has highlighted the value and need for continued research into the field of police business information systems and scope for research endeavours focussing
on the development of police specific technologies by the research community. It has also highlighted the underlying culture of coping and adapting with respect to technologies, noting that the scope for police to respond to crime is influenced by the adequacy of their technologies amidst other factors. Of note, there is continued scope to improve policing, however given the emergent nature of crime in an age of rapid innovation, that scope is influenced by the emergent technological and sociotechnical issues that exist in policing spanning procurement constraints, externally enacted policies, scrutiny, and sustainable innovation. It is evident that police use of information has improved over the decades, however further improvements as indicated by this thesis are dependent on funding which continues to diminish and government investment in long term digital capacity given evident low levels of sophistication with respect to technologies. Continued innovation in policing is also dependent on police cultural perspectives and capacity to keep abreast of datafication concerns, technologically enabled and motivated crimes, and enhancements to legislation around this. Finally, although it is evident that technological innovation and adoption have the potential to improve policing, expectations currently exceed funded capacities and these improvements will continue to be influenced by politics, scrutiny, policies, and their potential (mis) alignment with the realities of policing.
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