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Victoria Climbié, Baby P and the Technological Shackling of British Childrens' Social Work

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Abstract

A computer system known as the Integrated Children's System (ICS) was specified by that part of the British government responsible for child welfare—the Department for Children, Families and Schools (DCSF). The specification was developed in response to the failings of a number of agencies that could have prevented the death of a young child Victoria Climbié. The system specification gave rise to a number of implementations that were deployed in all but one of the local authority departments associated with children's welfare. It did not prevent a second death. This article shows that whatever criterion you use to judge the ICS it failed—not just in terms of preventing the second death, but in terms of its usability, fitness for purpose and efficiency. The article is a chronicle of the events that lead up to the development of the ICS starting with the death of Victoria Climbié and the deployment of a flawed system and concludes with the aftermath following the death of a child known as Baby P. Most of the literature on ICS has concentrated on the deleterious effects on social workers. This article looks at some of the reasons why it is defective. It concludes with two simple solutions. Although in financial terms the failure of ICS is small compared with other system failures in government, in terms of its effect of a whole profession responsible for the care of young people at risk it is large. While this article deals with one particular human-centred systems failure in the United Kingdom its lessons are general and not just specific to a British context.

1 Introduction

This article looks at the development of ICS and some fatal mistakes that were made by the DCSF that ensured the system would not be successful. It critically examines a number of issues that arise from ICS¹. These include: the use of software to impose on professionals a set of quasi-industrial practices; the idea that computer code is always better than well-designed manual processes and can replace them; that life-critical systems are not just confined to

¹When I use the term ICS I mainly refer to the documents and processes that were employed in the DCSF for requirements specification and system design before implementation commenced. As I make clear later the developers of the various instantiations of ICS are blameless—I regard them as victims.

areas such as nuclear control, medicine and avionics; that computer code can replace good managerial practice; that software technologies normally used for the development of industrial systems such as those deployed in retail, banking and customer relationship management applications can be used for developing human-centred applications; that simple (and cheap) solutions that may address the vast majority of functionality are less preferable to systems that implement every functionality; that when a system is used by large numbers of distributed user groups that a one-size-fits-all approach should be preferred to a system which provides core functionality that can be easily modified to reflect local practice; that full functionality should be developed *ab initio* rather than drawing on existing functionality and that, in a human-centred system, where unstructured data dominates structured data in both importance and quantity, it is the latter that should drive technological decisions.

ICS is an example of a chronicling system: one where an individual's interaction with a number of agencies is documented. Such systems have a history of failure; ICS in financial terms (£30m) is pocket money compared with other failed and troubled chronicle systems². However, I would posit that it is an important case study: it collects together a very large number of questionable assumptions—cultural, managerial and technical and it is a rare example of a system that failed after a period in use—not when the budget ran out, when the customer refused to accept it or when some internal or external body called in the technical morticians.

Evaluations of the system have described how it has transformed children's social work into an industrial process whereby 60-80% of a social worker's time is spent using a computer [6].

The article concludes by outlining two computer-based solutions that show how a system can be built that can respond to short to medium-term problems and, at the same time respond to long term changes such as a realization by government that social work is not a vaguely moral job which is similar to running a call centre or administering a retail system.

2 A Chronology

In 2002 a young child, Victoria Climbié, died. She died at the hands of her guardians. It happened in a part of Outer London known as Haringey³. She was burned by cigarettes, scalded, kicked, assaulted with heavy objects such as wooden coat hangers, abused and beaten; in the final months of her life she slept in a bath within a bin bag containing her own excrement and urine and was fed while in the bag.

Victoria was eventually rushed to the North Middlesex Hospital suffering from malnutrition and hypothermia. She was transferred to an intensive care ward at St Mary's Hospital in West London where she died. Dr Nathaniel Carey, the Home Office pathologist who examined Victoria's body, found 128 separate injuries and scars, many of them cigarette burns, and described them as 'the

²An example here is the C-Nomis system, a chronicling system that tracked offenders through the justice system and consumed £600m before being cancelled [4].

³Her death occurred while she was under the 'care' of the Haringey Social Services Department; however, she had been seen by a number of other social service departments in other parts of London.

worst case of child abuse I've encountered'.

There were twelve opportunities for the agencies (the police, the health authorities and the local social service department) involved to rescue Victoria. For example, on the 14th July Victoria made a visit to the hospital after the daughter of her child-minder suspected she had non-accidental injuries. The doctor at the hospital accepted her guardian's story that Victoria had inflicted the wounds on herself by scratching at scabies sores. A policewoman and a social worker were eventually assigned to the case after doctors alerted child protection authorities as a precaution. They later canceled a home visit scheduled for 4 August after hearing about the scabies.

The British government set up an inquiry into the death which had a broad remit that included reform of the children's social services system. The horror of Victoria Climbié's life was exemplified by a statement written at the beginning of the report of the inquiry by Neil Garnham QC, its counsel; it describes the final days of her life

The food would be cold and would be given to her on a piece of plastic while she was tied up in the bath. She would eat it like a dog, pushing her face to the plate. Except, of course that a dog is not usually tied up in a plastic bag full of its excrement. To say that Kouao and Manning⁴ treated Victoria like a dog would be wholly unfair; she was treated worse than a dog. [1] 1.1 p1.

3 The Inquiry

The inquiry that was set up by the British government was the most extensive investigation of social work practice in the United Kingdom, although much of its remit was associated with the death of Victoria Climbié there were elements which had major repercussions for social work in the United Kingdom; in particular that the inquiry should:

...reach conclusions as to the circumstances leading to Victoria Victoria Climbié's death and to make recommendations to the Secretary of State for Health and to the Secretary of State for the Home Department as to how such an event may, as far as possible, be avoided in the future. [1] 2.5 (4) p15.

A large number of recommendations were made by the inquiry. Many of them were concerned with the restructuring of children's services at governmental and local level. A number of recommendations were also made to improve the processes of the agencies involved in health care and policing and in the interaction between these agencies and local social service departments.

The vast majority of the recommendations made by the inquiry are outside the scope of this paper, a key recommendation however was the establishment of a database that could be used by social workers responsible for child protection.

There are numerous references to databases throughout the report, mainly concerning the lamentable state or non-existence of databases used to support child care, for example

⁴Her guardians.

In addition to the backlog of referral details waiting to be inputted because of staff shortages, the absence of a common database in social services meant that administrative staff had to complete checks on five or more different databases. As the duty administrative team staff did not have direct access to most of these, the time taken to complete a check was unnecessarily lengthened, which just added to the workload. [1] 5.33 p77

and in a discussion of administrative arrangements at the Brent local authority social services department⁵

A clear example of the failings of the independent business units was the absence of a common database throughout the whole of social services, let alone the whole council. In 1993, the main system in use was the Social Services Information Database (SSID) and this continued to be the predominant database used by adult social services and the One Stop Shops. In May 1996, when Mr Bamford arrived in childrens social work, the department had no connection to SSID after a corporate decision had been made to discard it. He believed that parts of social services were meant to make their own alternative arrangements. In so doing, and because SSID was not generally considered by Brent to be an easy system to use nor did it lend itself to reporting information on children, Mr Bamford decided that childrens social work would use *Filemaker* as their primary database. This database was only accessible by administration and not practitioner staff. In addition to *Filemaker*, Mr Punch, who was responsible for inputting practically all the child protection referrals, had his own system specifically catering for child protection cases. Mr Bamford explained that the operation of five or more different systems in social services ‘was not an ideal situation’, with the consequence that telephone calls would have to be made to different departments to find out whether or not a family was known.[1] 5.46 p80

An impression that one gets from the inquiry report over and above many poor examples of management and administration within the social services involved in interacting with Victoria Climbié was of social workers poorly supported by information technology. Another much more important impression that you gain from the report was that while poor database provision lead to inefficiencies; it was poor management and administration that were major contributing factors to the tragedy—for example the dysfunctional organisation within Haringey council.

Examples of poor practice were also documented in an independent inquiry into Haringey Social Service’s handling of Victoria’s case, for example, it was discovered that the social worker assigned to the case had: failed to call a child protection conference despite the recommendation of a strategy meeting; had failed to carry out a Section 47 inquiry⁶; had failed to give ‘proper attention and

⁵The reference in the excerpt to Mr Bamford is to Branton Bamford, Assistant Director for Finance and Administration at Brent; the reference to Mr. Punch is to Martin Punch who was one of the administrative support workers at Brent

⁶An inquiry carried out by a local authority in order to make a decision as whether or not it should take any action to safeguard and promote the welfare of a particular child. It is

evaluation' to much of the information about Victoria's case; had failed to carefully read a FAX from Central Middlesex Hospital about Victoria's admission; had failed to interview Victoria; had failed to check that Victoria was attending school; had not applied Haringey's child protection guidelines or national government guidelines; and had failed to inform a consultant at North Middlesex Hospital of the outcome of her enquiries into Victoria's welfare despite promising to do so.

The same independent inquiry also described major deficiencies in the management of the social worker by her line manager and other senior members of Haringey Social Services. A major point that it is worth making here is that nowhere in this particular example and in the Laming Inquiry report is the absence of a database or computer support cited as a direct reason for the death of Victoria Climbié. Any effect that poor IT facilities would have had would have been indirect, for example causing wasted time on record searches which could have been spent on more important tasks.

The inquiry recommended that two databases be set up. The first being a national children's database. One of the problems with child protection is that a number of agencies interact with a child and finding information about the child and the interactions is often very difficult. This led to the development of the *Contact Point* database: a directory containing a child's details and data about the agencies that have interacted with the child.

This article is not about *Contact Point*, even though it has attracted considerable criticism, for example regarding the security of the database⁷. The article is about a smaller database-based system (ICS) that was developed in response to the Climbié inquiry recommendation and which has had a much larger effect.

The specific recommendation for this database was

Local authority chief executives must ensure that only one electronic database system is used by all those working in children and families services for the recording of information. This should be the same system in use across the council, or at least compatible with it, so as to facilitate the sharing of information, as appropriate. [1]
Recommendation 32. p375.

The response from social work academics to the Climbié report was prescient and predicted many of the attitudes and requirements drivers that lead to the development of ICS. For example Stanley [27] predicted that 'The danger is that tighter structures for scrutinizing and monitoring child care work will result in a focus on procedure rather than increasing practitioners' capacity to engage with families; more boxes will be ticked but children will still go unheard'. Rustin [23], who as well as pointing out the problems of drawing general conclusions from an albeit horrific single case, also criticized the bureaucratic and procedure-oriented nature of public service delivery that the Climbié inquiry exemplified. Reder and Duncan [21] predicted that that there would be a risk that

...this inquiry, like many others, will promote bureaucratic changes (i.e. the level of organizational structures, written protocols and monitoring procedures) that are distant from frontline staff's need

specified in section 47 of the UK Children Act 1989.

⁷See, for example, At risk from the registers? *The Guardian* 24th March 2009.

to improve their understanding of complex cases and to acquire and apply appropriate skills⁸.

4 The Development of ICS

The first stage of the development of the ICS was that of constructing a requirements document. This was described by the Secretary of State for Children Schools and Families

The ICS requirements were originally produced as part of the Quality Protects Management Information project, by a team comprising Department of Health (latterly, following machinery of government changes, Department for Education and Skills) officials, local authority officers, and academics working in collaboration. Frontline social workers and managers were involved in development through consultative workshops and local trialling of materials. Commercial suppliers of childrens social care systems were also consulted and informed.

In order to learn about the processes involved in the provision of childrens social care services the Department of Health consulted with local authorities and policy specialists. This enabled them to structure the broad information requirements in a logical, systematic way⁹.

The requirements have been subsequently updated by the DCSF, through a collaboration of policy and practice advisers with front-line social work experience and contracted specialists with knowledge of the production of industry-standard requirements documentation. The most recent requirements have taken account of technical queries raised at earlier stages by local authority officers, and were partly informed by a dedicated workshop with a number of local authority officers involved in ICS implementation.

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This is a classical description of the process of determining the requirements for a human-centred system¹⁰.

The DCSF developed a number of documents that formed the requirements specification. One of these ensured that the ICS was shackled from the early days of the project to the point where the software produced can be regarded at very best as flawed and, at worst, not fit for purpose. The four key documents or document sets are detailed below:

A Statement of Business Requirements. This was a short (6 page) document that provided an excellent high-level view of what the ICS should do. In terms

⁸The only item they forgot was the database and associated computer programs that implemented the organizational structures, written protocols and monitoring procedures.

⁹As you will see later in this article this sentence encapsulates a major problem with ICS: that of imposing a rigid structure on a profession whose work is certainly not structured.

¹⁰The subsequent events described in this article describe a problematic implementation based on a poor analysis of requirements; it is unclear given the Secretary of State's statement how this happened.

of quality it matches many of the good, industrial-level, initial requirements documents that I have encountered as a consultant.

ICS Minimum Compliance Criteria. This was effectively an expansion of the previous document. Each business requirement¹¹ was split into sub-requirements and criteria specified for each requirement. For example business requirement D31 specified that

Each child's record includes a unique identifier and has provision for recording similar identifiers used in other applications as is appropriate to support integrated working across agencies.

with sub-requirements 'Each child's record includes a unique identifier' and 'and has provision for recording similar identifiers used in other applications as is appropriate to support integrated working across agencies'¹² and a set of criteria including, for D31, 'The system should have the capability of recording at least three identifiers' and 'The identifier must be unique to that child within ICS within the LA'. A local authority that wanted funding from the government would need to implement a system which addressed the minimum compliance criteria¹³.

A set of exemplars. These were forms documents that demonstrated the documentation that should be filled in by the user of ICS and stored in a database. These are categorized as: general records, child protection forms, core assessment records, child or young person in need planning and review documents, assessment and progress records for looked after children and ICS Outputs for Court. There were 32 of these documents. A typical exemplar was the core assessment record for a child aged 5 to 10 years which was 27 pages in length.

ICS Exemplars: Common Principles. This was the shortest document; one which ensured that the ICS project was flawed. It effectively stated that the exemplars were not to be modified except in trivial ways, for example changing the order of text fields or check boxes in a form.

5 The role of the Exemplars

One of the problems with the ICS is the exemplars. It is worth looking in more detail at one of these: the core assessment for a child aged between 5 and 10 years.

The assessment record is headed by two pages that contains bureaucratic information such as the age of the child being assessed and their address. This is followed by pages that should be filled in by a social worker about the child. Each chunk of information that is provided is accompanied by a number of check boxes.

¹¹The term 'business requirement' is revealing; throughout the documentation describing the development of the ICS there is a theme that what was being developed was not very different from an IT system that would be used by a bank, building society or retail chain.

¹²Many of the sub-requirements are just cut and paste repetitions of each requirement. They just represent a finer-grained, sub-component based view of each requirements with little or nothing added.

¹³Virtually all local authorities implemented the ICS, the exception being the Royal Borough of Kensington and Chelsea who, in refusing any grant money, made the prescient statement that an ICS that arose from the DCSF specifications would 'not be fit for purpose'. They developed a successful system which was more holistic than the ICS and which concentrated on the family as a unit.

A typical chunk describes the child's developmental needs in terms of health within the core assessment exemplar. The main text is introduced via the text 'Notes and evidence on the child's health needs. Note when an issue is not relevant.' This free text is supported by ten yes/no tick boxes including 'H8 Child frequently wets the bed', 'H6 Participates in activities e.g. sports, dance or similar activity' and probably the most important 'H10 Has had many accidental injuries'.

In all there are 15 of these chunks within the core assessment exemplar: 'Health: Childs developmental needs', 'Health: Parental capacity', 'Education: Childs developmental needs', 'Education: Parental capacity', 'Emotional and behavioural development: Childs developmental needs', 'Emotional and behavioural development: Parental capacity', 'Identity: Childs developmental needs', 'Identity: Parental capacity', 'Family and social relationships: Childs developmental needs', 'Family and social relationships: Parental capacity', 'Social presentation: Childs developmental needs', 'Social presentation: Parental capacity', 'Self-care skills: Childs developmental needs' 'Self-care skills: Parental capacity', 'Parents/Carers attributes and the impact on their capacity to ensure that the child's safety from harm and to respond appropriately to his/her needs' and 'Family and environmental factors which may impact on the child and parenting capacity', In total 158 checkboxes are presented to the social worker for just one of the large number of exemplars¹⁴.

There are a number of important points that need to be made about the exemplars:

- The extent that natural text dominates the forms: most of the work filling in the forms would involve typing natural language. Even though there are a large number of tick boxes the amount of written text dominates.
- The partitioning into areas implies an implementation where information is chunked. This acts in opposition to the fact that information about a child should form a narrative [17]; this is even acknowledged in documentation produced by the DCSF; for example the guidance notes for the core assessment stated that 'A chronology should be commenced as part of a Core Assessment. It should continue to be updated until the case is closed'.
- The document *ICS Exemplars: Common Principles* made their use mandatory. Taken in conjunction with the fact that the exemplars were partitioned into functional areas there would be a very strong pressure on the developers of ICS to implement a windows/forms-based implementation. This resulted in the requirement for some form of chronological reporting to be seriously weakened. Social workers require a whole picture view of a child and existence of the exemplars and the fact that they were mandated provided a major roadblock that had to be overcome. Moreover, they are often required to produce summary documentation, for example when considering fostering and dealing with organisations such as the National Society for the Prevention of Cruelty to Children. Structuring the exemplars in such a way and making them compulsory created a major roadblock

¹⁴It is worth pointing out that in each of the chunks the social worker who fills in the form is asked to note when an issue is not relevant.

- At the end of the core assessment exemplar there is a page that describes how the exemplar was developed. It stated that ‘The Assessment Record is based on research information drawn from a number of sources’. There is no mention of the requirements analysis described by the secretary of State which I reproduced in Section 4; there is no reference, for example, to interviewing social workers and their line managers. The sources are listed on the page and are mainly books or government publications, for example [24] and [28]¹⁵.
- In their critique of the Common Assessment Framework¹⁶ White, Hall and Peckover [30] make an overwhelming case that social work is chronology and narrative-based and that forms such as the exemplars are in antithesis to the everyday experience of the social worker where narrative plays a very important part [17].

ICS was implemented by a number of systems developers based on requirements documents provided by the DCSF. It has a number of instantiations including packages that are currently in use at a number of local authorities. It had a troubled developmental history in that 20% of councils were unable to implement the system by the deadline given by the government.

It is worth stating at this point that the deficiencies in the ICS should not be attributed to the software developers: they were given a very narrow brief that was constrained by the fact that the exemplars were mandatory. The DCSF made a major error in this as it effectively forced an implementation which was more akin to those systems used in banking, retailing and industrial production. Such systems are characterized by: exact data (the balance of a bank account or the number of items in stock at a warehouse); the virtual absence of free text and where any free text can be easily placed into categories, for example the reason for returning an item to an online clothes retailer can be categorized as: too big, too small, didn’t like the colour etc.; and where the events that make up a chronology are rigidly ordered. The interactions involved in social work have a broadly temporal progression but within this there is considerable variance in the events, the interactions when documented will only contain a small amount of exact data (child’s name, address etc) and where most of the documentation of interactions involves free text.

The DCSF made a major error: by mandating the exemplars they virtually forced an implementation and, in doing so, made a major error that has been warned against in standard texts in requirements engineering such as [22] and taught to students of software engineering over the past twenty years: that the requirements documents for an IT system should contain a description of *what* a system does *and not how it should do it*.

6 ICS in use

A good starting point in examining the success or otherwise of the ICS is the evidence that UNISON, a trade union that represents many staff in local gov-

¹⁵Most of the citations are to works which were written in the period 1990 to 1999 with only one item in the press. The exemplars were released in 2003.

¹⁶This is the framework that arose from the Laming report in which ICS is one component.

ernment made to the second Laming Inquiry which arose from the Baby P catastrophe [3] that I discuss in Section 7.

UNISON wishes in particular to draw Lord Laming’s attention to the seriousness of the problems being experienced by social work staff with the Integrated Children’s System. Following a number of reports of difficulties being experienced, UNISON has recently carried out a survey of branches to test how widespread the problems are; whether these are primarily implementation, software or general teething problems; or whether this is a fundamental issue with the whole system. We have found that the problems appear to be fundamental, widespread and consistent enough to call into question whether the ICS is fit for purpose.

The reports we have received show that the direct impact of the system is to delay, frustrate and disrupt the flow of work in busy and over-stretched teams. But in addition it adds to the sense of disempowerment and demoralisation among social workers when a system is imposed that hampers their work so severely, yet there is little management response.

A number of problems were detailed:

- a disproportionate burden on social worker time taken up with data entry;
- forms were too lengthy, over-complex and excessively time consuming;
- there was a rigid tick-box approach and lack of flexibility to reflect needs of different families: it did not allow the worker to ‘tell the story’ in a logical way;
- it was designed for data management rather than for supporting an individual approach to cases and information sharing;
- the exemplars were too prescriptive and repetitive;
- it was unwieldy and alienating for children and families to engage with;
- free-text boxes did not have enough space and social workers had to spend excessive time trying to edit assessment information to fit the box¹⁷;
- duplication of information needing to be entered in several different places: ‘If a family of four children is referred 12 ICS assessment records have to be created, completed and individually authorized before the work can be allocated’;
- system issues—frequent system crashes and loss of work;
- documents not printing correctly;
- freezing and slow running of the system together with ‘lock-outs’;

¹⁷This seemingly small detail reveals much about the development of the ICS system. The narrative part of an ICS form had to be shoe-horned into a database more used to dealing with fixed length text: those found in industrial applications such as banking. It also betrays a misunderstanding of the day-to-day work of a social worker.

- incorrect formatting of dates of birth; social workers could not access the same record at the same time even on a ‘read-only’ basis;
- cases had to be categorized very early prior to any assessment, yet the presenting category appears prominently on all future documentation;
- intrusive and inappropriate questions were posed at initial assessment;

The assessment by UNISON was backed up by a number of academic studies which interviewed social workers, examined documents and critically accessed the application-based processes involved in developing ICS. Broadhurst *et al* [9] detailed major problems in carrying out initial assessment of children and discovered major problems; Shaw et al [26] examined ICS from the point of view of statistical reporting, the experience of social workers using the system and the implications of ICS for social work practice in terms of the time used by social workers in interacting with the system, they found major problems in all these areas and recommended a review of the ICS; and Wastell, White and Broadhurst [29] in the most critical assessment of the ICS pointed out that it represented a chiasmus¹⁸ in that an IT-supported process intended to aid the work of a social worker had shackled it.

The DCSF commissioned a report into the functioning of the ICS in a number of pilot authorities by the University of York [6]. Although the text is written in a considered and academic way the message is clear from this document that although IT-based recording is to be welcomed, the ICS system was seriously flawed. The reasons outlined by researchers at York matched both the view of UNISON and academic researchers. It finished with a plea:

We recommend, therefore, that further progress takes into account our recommendations for change, and that the ICS is not extended to other services for children before monitoring of the issues identified above has been undertaken.

a plea that was largely ignored by the DCSF¹⁹.

A very worrying statistic that arose from the York evaluation and from other research [20, 29] was the large amount of time that social workers spent using computers to interact with the ICS. In [6] some of the times were detailed Completed initial assessments took a mean time of 10.19 hours, completed core assessments took on average 48.14 hours; completed child care plans took an average of 27.4 hours and completed reviews took an average of 36.81 hours. Assuming a seven hour day this would mean that each case allocated to a social worker would consume something like 17 days of sitting at a computer²⁰. What is particularly striking is that this extra commitment to bureaucracy did not result in a major increase in accuracy in reporting; indeed that there were substantial problems in statistical reporting with the ICS [26].

¹⁸The term ‘chiasmus’ is due to McLuhan who defined it as ‘the reversal of process caused by increasing its speed, scope or size—every process pushed far enough tends to reverse or flip suddenly’ [19], cited in [29].

¹⁹The DCSF did issue a report which was a watered down version of the York report. There was an extreme reluctance by them to issue the York report; it only emerged 18 months later in response to an Freedom of Information Act request.

²⁰Assuming an allocation of 12-15 children this would mean that each social worker would be occupied at a computer for between 60% to 75% of their time and skimping on important tasks such as visiting a child at risk.

The DCSF *eventually* concurred with the worries expressed by Social Workers, local government managers and academics and issued guidance to local authorities in a 2009 circular *ICS Guidance Note: Improving the Usability of ICS Systems*. It contains:

- Tutorial material about usability in the context of a computer system; this reflects current orthodox views about human-computer interaction as, for example, found in standard texts such as [25]. This is effectively a collection of technical views about usability that have been rewritten for a lay audience.
- A list of problems and the overall reasons for these problems. The latter include the local IT infrastructure, the actual ICS system in use and errors in the national ICS specifications. In one of the most damning parts (Figure 1) of the document there are many examples of poor usability—these are listed in Section 8 of this article where I show how a radical change in direction in ICS implementation could considerably simplify the social worker’s day-to-day interaction with the system and would address many of the problems. Taken as a whole the Figure 1 in *ICS Guidance Note: Improving the Usability of ICS Systems* indicates a failed system.
- A process modeled on the APIR social work methodology (Assess, Plan, Intervene and Review) which would enable childrens’ departments to identify deficiencies, prioritize them and then interact with suppliers in order to remedy them.

The document does not provide any suggestions about functional changes since a number of implementations of the ICS are extant.

The defects outlined in *ICS Guidance Note: Improving the Usability of ICS Systems* are lost time due to error chasing, rework, delays to casework, time spent in administration rather than on working with children and families, a decrease in morale, retention and motivation issues, increased cost due to error chasing and additional training, duplication of work, users building in short cuts leading to poor practice, non-compliance with statute or data returns, processes not shared across an authority, users reverting to other systems such as *Microsoft Office*²¹, wasted time spent on training, work slowed down, key facts being lost, patterns being lost, opportunities to share data between professionals hindered and best practice not shared. While these effects do not directly affect a child in need, they do have the effect of considerably increasing the probability of tragedies such as that of Victoria Climbié.

Many of these problems were detailed in the UNISON evidence quoted at the beginning of this section and indicate a system with considerable problems. The main thrust of the document *ICS Guidance Note: Improving the Usability of ICS Systems* indicated that the view of the DCSF is that the system was rescuable and that this could be achieved by relatively small changes; however, if you examine the defects that are listed in just that document they indicate a failed system.

²¹As you will see in Section 8 I do not regard this as a problem but as a viable solution.

7 Baby P

Peter Connelly (Baby P) was a 17 month old child on the child protection register of Haringey Children's Department; he had seen over sixty times by staff from a number of agencies including social workers from Haringey.

After 17 months cruelty, he died. He had been reduced to a nervous wreck, his hair shaved to the scalp and his body was covered in bruises and scabs. Physical injuries discovered during the autopsy included eight broken ribs, a broken back and the missing top of a finger. He died at the hands of his mother and her partner.

There were a number of similarities in the case of Baby P and that of Victoria Climbié: the huge public outcry, the level of appalling cruelty that was visited on two defenceless children, the fact that deficiencies in the handling of the cases had little directly to do with computer databases, the fact that the agencies involved had a number of opportunities to intervene and move the children from their environments²² and the fact that Lord Laming was called in to carry out an inquiry. There was one difference: ICS was used in Haringey at the time of Baby P's death.

In 2008 Haringey was the subject of a joint area review from OFSTED as a consequence of the death of Baby P²³ Two important points emerge from this review. The first was that, as with Victoria Climbié reviews, the death of Baby P was not *directly*²⁴ the result of computer-based documentation problems. The second result is that the ICS system and its use was defective:

Not all childrens social care files have a chronology of the individual case²⁵. Police files also do not establish clear chronologies of events and it is difficult to decipher the key points at which decisions are made. *Para 18 p8.*

and

Case file recording for individual children and young people is inadequate. There is insufficient evidence of managerial oversight and decision-making on case records in childrens social care services, police and health services. There is also limited evidence of thorough, analytical and reflective supervision to ensure individual casework is carried out effectively. *Para 16 p7.*

and, as a main finding, (one out of 10 main findings)

The standard of record keeping on case files across all agencies is inconsistent and often poor. *Para 7 p4.*

²²In the case of Baby P a consultant paediatrician was the last doctor to see Baby P alive, two days before his death. She failed to identify a broken back and ribs, recording that the examination could not be completed because the baby was 'miserable and cranky'. Another paediatrician, Dr Heather Mackinnon, examined Baby P and was so concerned at his injuries that she contacted Haringey Social Services. She expressed concern at a suggestion he should be returned to his mother; nothing was done about this by the Haringey Children's Department.

²³OFSTED (the Office for Standards in Education), is a British government body charged with auditing standards in local government. Its initial remit was education, however, it was charged with the inspection of childrens' departments after the Victoria Climbié affair.

²⁴Again it is worth re-emphasizing that the problems that it posed social workers make the probability of tragedies such as that of Victoria Climbié much more likely.

²⁵This is one of the major criticisms made of the ICS.

The last statement is particularly damning: it indicates that ICS as a solution for the problems of poor record keeping—one of its major trumpeted aims—failed.

8 Two Solutions

In this section I will examine two simple solutions that address virtually all the problems that have been described by the UNISON trade union [3], the DCSF in their document *ICS Guidance Note: Improving the Usability of ICS systems* issued in December 2009, the University of York review of the pilot implementations [6] and a number of academic studies of its use in the field such as [26] and [29]. Each solution is simple and, I believe, effective and is in tune with one of the main themes of a recent review of IT failure in government: that local and central government should always be pessimistic about IT projects and a rational response to this is the development of simple, unambitious systems [14].

8.1 The Failures

The failures of ICS fall into a number of categories.

Technical problems These include slow page loads, slow data saves, time-outs, data loss, problems with undos, problems with cloning (cutting and pasting text from forms-based windows) problems with autosave and difficulties with sharing outputs.

Workflow problems These include an inability to use the system outside the office, process design issues, poor system design and overall problems with workflow.

Problems associated with the chunking of data These include inability to have multiple windows open at all times, problems with multiple records, atomisation of data and the number of clicks needed to achieve a task.

Task-related problems Screen design issues, form design issues, unwieldy form design

Global problems Global problems include the inability to change ICS quickly and the fact that the system is based on a perverse view of how a social worker carries out their job: that it is similar to that of staff who work in an industrial firm.

There are a number of issues that lie outside the realm of technical improvement and are associated with the original set of requirements documents. These include the fact that too much data is generated; that messages, for example email messages, to social workers are numerous and are akin to a form of technical nagging; and that social workers were unable to understand the guidance associated with the forms they used and the existence of non-intelligent functionality²⁶.

²⁶In the many documents I have examined it is not clear what the phrase ‘non-intelligent functionality’ means and so I have parked it in this list; it is perhaps a reference to the fact that ICS takes little cognisance of the day-to-day work of the childrens’ social worker; if so, it would be slotted into the *Global Problems* category.

8.2 Solution 1 Employ a Word Processor

The first solution would involve each child's record of interaction being stored in one word-processed document. When a social worker interacts with a child in need a number of events occur, these include a child being referred, an initial assessment being carried out, a core assessment being carried out, a report being prepared for a fostering agency, an emergency care order being sought and the preparation of a child in need plan.

Each of these events would be associated a template form that was mainly text-based²⁷ and which could be copied and inserted into the child record in date order forming the chronology that whose absence has been criticized by UNISON and academics. If forms-based data was needed such as check-boxes a word processor such as *MS Word* would provide such facilities.

In terms of organisation of the data store for the application two options would be possible: a central store of word-processed child records accessible via Internet connections or a local solution in which records would be held on local computers and periodically copied to a central data store. Each has advantages and disadvantages, for example the former is more secure. Which would be ideal is outside the scope of this paper. The important point is that both involve a central store of children's records.

Periodically the store of records would be easily processed and stored as `txt` files; this is a trivial piece of programming. The `txt` versions of each child's record would then be converted into an XML document²⁸. Careful design of the word documents, for example ensuring that text separators which heralded important text and situated between text such as guidance notes and a narrative were positioned properly, and were unique, would ensure that the conversion to an XML form would be straightforward.

So, there would be two versions of a child's record: a word-processed version that can be used by social workers carrying out their day-to-day job and an XML version that could be used for statutory reporting and for local reporting, for example providing data and statistics to line management about open cases²⁹. There would be no need for the inflexible use of industrial technology such as relational databases as records are mainly natural language-based and, in general, will be relatively short in length (no more than ten thousand words in length on average). Any reporting functions can be implemented using an XML event-processing technology such as SAX.

It is worth looking at the problems that I outlined in Section 8.1 and how such a simple solution would address them:

- *Technical problems*: all the problems I have listed are immediately solved by the use of a word processor, for example *MS Word* and *OpenOffice Writer* have reliable undo and autosave functions and sophisticated printing facilities that allow social workers to share their work with others such as other care agencies.

²⁷The only exception would be a contact sheet which would contain basic reference data such as the name of child, date of birth, address, family members etc. This sheet would be the first item in the child record.

²⁸A mainstream string processing technology such as Perl could be used.

²⁹As a spin-off the XML file would be suitable for natural language analysis and data mining such as that described in [7] and [8]. However, it is worth stressing that this is not the rationale for my implementation.

- *Workflow problems*: these are mainly due to an inflexible design that forces the social worker to switch attention, for example forcing the social worker to move between individual chunks of a child’s record in carrying out a task such as writing a report for a case review. A single-word processed document would eliminate these problems; the only burden on the user—a small one—would be that of using the search facility of the word processor.
- *Task-related problems*: these are mainly concerned with problems associated with the design of the forms in an ICS implementation. A word-processed solution would not automatically solve these problems. However a solution which made natural language its key data would not suffer from this problem; a word-processed solution which included form elements such as data fields and checkboxes would, as a very minimum, be capable of rapid change in order to respond to user problems.
- *Global problems*: All the problems in this category can be distilled into the view that ICS implementations, driven by a perverse view of social work embodied in requirements documents issued by the DCSF, do not address the day-to-day experience of the childrens’ social worker. There are a number of defining features of social work: it has a narrative focus [17] expressed in criticisms of the ICS by social workers that they were unable to see ‘the big picture’; is mediated; involves a number of actors with different demands and expectations; has a broad chronology in which the sub-chronology is much less pronounced (if not absent) and less exact; and is a long distance from the processes involved in commercial computing which have a strict chronology, have few decision points, where any textual data can be codified; and have well defined intermediate and final outputs. A word processed document—the ultimate in flexible documentation—would be a much more satisfactory solution than the forms-based, relational database-based current ICS solutions³⁰.

Figure 1 shows the template for *Health Child’s Developmental Needs* within the Core assessment for a 5 to 10 year old child without check items. Words such as `HDNChildDevNeeds`, `HDNText` and `EndHDNText` act as punctuation marks that enable the text to be efficiently processed. Figure 2 shows the template for *Health Child’s Developmental Needs* within the Core assessment for a 5 to 10 year old child with check items³¹.

8.3 Employ *MediaWiki*

Wikipedia is an online encyclopædia. It is one of the most impressive results of the progression of the Internet from a one-way transporter of communication to a two-way transporter. The software that drives the Wikipedia web site is known as *MediaWiki*[5]. It allows the development of web pages each of which represent a particular Wikipedia topic.

MediaWiki is a very stable package that has a surprisingly low number of errors, it is free and is easy to maintain—even when processing the input from the

³⁰Pre-ICS social workers would use *MS Word* as their documentation medium and in some of the evaluations of ICS there is evidence that a number have reverted to this technology.

³¹It is reproduced here just to show that all types of approaches are possible with a word processor—even that of the original ICS brief.

Form HDNChildDevNeeds

Health: Child's Developmental Needs

In the space below write down your impression of a child's health; do not feel constrained by the lines that delineate the text: as you type the space for text will increase.

Factors you may need to consider are whether: the child is generally well, their height/weight is at the expected level, their hearing and vision is satisfactory, they have a regular sleep pattern, they eat an adequate and nutritious diet, they participate in activities such as sport, their immunisations are up to date, they frequently wet their bed, they soil without physical explanation and have had many accidental injuries.

In filling in this form do not delete any text that is already in the form as it is needed for computer processing.

HDNText-----

EndHDNText-----

Figure 1: A form without check items

hundreds of thousands of users that access Wikipedia. It is a type of primitive content management system which is suitable for low-level applications. For applications such as keeping hundreds of thousands of documents it is inappropriate [5]: it requires very strict access control, cannot interface with popular software such as *MS Word*, uploading files can be difficult, it has no facilities for workflow and it requires users with some technical skill to employ all of the facilities associated with creating a document, including for example, constructing tables. However, for small-scale applications such as documenting childrens' care records these problems all but disappear:

- The access control required in an ICS application is relatively simple: write access can be given to a social worker and read access to others, for example the social worker's line manager. This can easily be implemented in a *MediaWiki* implementation.
- There would be no need to interface with applications such as *MS Word* as all text that would be stored would be directly typed by a social worker into a web page.
- There would be no need to upload files: all text associated with a child would be directly entered.
- The fact that it has no workflow facilities is an advantage for this type of application. I would have failed in this paper if at this point you would not

Form HDNChildDevNeedsTick

Health: Child's Developmental Needs

In the space below write down your impression of a child's health; do not feel constrained by the lines that delineate the text: as you type the space for text will increase.

Please indicate those factors you considered and feel important.

H1 The child is generally well.	Yes/No/Did not consider
H2 Their height/weight is at the expected level.	Yes/No/Did not consider
H3 Their hearing and vision is satisfactory	Yes/No/Did not consider
H4 They have a regular sleep pattern.	Yes/No/Did not consider
H5 They eat an adequate and nutritious diet.	Yes/No/Did not consider
H6 They participate in activities such as sport.	Yes/No/Did not consider
H7 Their immunisations are up to date.	Yes/No/Did not consider
H8 They frequently wet their bed.	Yes/No/Did not consider
H9. They soil without physical explanation.	Yes/No/Did not consider
H10 They have had many accidental injuries.	Yes/No/Did not consider

In filling in this form do not delete any text that that is already in the form as it is needed for computer processing.

HDNText-----

EndHDNText-----

Figure 2: A form with check items

have realized that a strict workflow is irrelevant to the day-to-day work of a social worker.

- If you confine text reporting to producing first level headings, italicizing, creating paragraphs and using bullet lists then the technical overload on a social worker would be very low³².

The solution would be conceptually the same as using a word processor: *MediaWiki* has a template system that allows users to include parameterized text in a web page³³.

There would be a small number of advantages and disadvantages compared with a word processor solution: printing is somewhat primitive in *MediaWiki*, the documents are readable but are not as sophisticated as a word-processed document; *Media Wiki* represents a better remote solution over that of accessing

³²Even if these facilities were found difficult it would not be a major task to implement a simple windows-based editor to develop the text.

³³It is arguable that the template facilities of *MediaWiki* are superior to those of a word processor such as *MS Word*.

a word-processed document using the Internet since it is based on a single web site; there is a small problem with the *MediaWiki* document creation process detailed above; *MediaWiki* has superb change control facilities compared with a word processor since it has to be capable of tracking all the changes to a Wikipedia article; and *MediaWiki* is open source and non-proprietary³⁴. I would contend, that there is little difference between the solutions.

Before leaving this section it is worth saying that *MediaWiki* is only one solution: commercial wiki-based software or commercial content management systems would all be good alternatives.

9 The Failures of ICS

One of the positive aspects of the ICS—probably the only one—is that it is a case study in failure in the e-government arena which is very rich in the quality and quantity of technical, organizational and managerial errors that were made; it is certainly a case study containing a large number of lessons that is applicable to a wide class of systems and countries—not just those concerned with child welfare in the United Kingdom. There are obvious issues which are outside the scope of this section although they have a part in the creation of the problems with ICS, for example the view of government that childrens' social work is a quasi-industrial process and in which IT is used as a panopticon [12, 13].

In this section I would like, in summarizing a number of points I made earlier, to concentrate on technical failure although; inevitably, I will draw on some issues that lie outside computing.

9.1 A Failure of Requirements Analysis

It is worth stating baldly that ICS is a failure—a requirements failure arising from an organizational failure. I have examined a number of documents which report on its implementation and its problems and, apart from glitches normally associated with the early operation of a complicated system, the implementation of the ICS cannot be faulted: the developers did what they were told to do by the DCSF. They developed a system which implemented a specification; it was just that the specification was wrong. The system delivered did not support the day-to-day, interrupt-driven work of a social worker³⁵.

9.2 Industrial Level Technology and Human-centred Computing

In order to explore this topic it is worth examining a process that forms part of an online retailing system. A customer orders an item and discovers that it is not what they wanted, they send it back to the retailer who then carries out a

³⁴This would either be an advantage or disadvantage depending on your view of Microsoft or open-source—something that certainly divides academics who often regard the former as inheriting the evil (and hegemonic) empire vacated by IBM in the eighties.

³⁵The system as envisaged by the DCSF was of a conventional MIS development when it resembled a real-time system with some degree of life criticality driven by event interrupts such as a social worker being alerted to conditions which required actions relating to obtaining a care order. The ICS documents described what was, in effect, a concurrent, life-critical, real-time system that was interrupt driven.

number of processes. This is the chronology: the customer sends back the item with a computer generated return-note that can be found on the retailer's web site; the item and the note is received by the retailer; the retailer then credits the customer with the amount that they spent on the item; the retailer then carries out one of two processes depending on the reason that the customer returned the item: if the item was defective then it is returned to the supplier who will then credit the supplier with the amount that they paid for the item, if the item was returned for another reason, for example it was an item of clothing that did not fit the customer then the item is repacked and put back in stock.

This chronology is exact, relies on exact data (price paid by the customer, cost of item to the supplier etc.) and has little variability: the variability that exists is predictable and is normally characterized by unambiguous multi-way decision points. Any textual data that is associated with such a process can easily be categorized, for example there may a number of reasons for the return of a bought item that can be implemented as a drop-down list.

The tasks that a social worker carries out are varied and are only predictable to a small extent. They involve fuzzy data documented as variable length text and a large number of interactions with people: colleagues, their line manager, the police, health visitors, the family of a child at risk, a childminder and so on. There is broad progress starting with a referral and finishing with the child in some situation in which they are safer than when the referral occurred. However, within that progress there is a large amount of variability including many fuzzy decision points that depend on factors such as whether the child has health problems, has physical disabilities has special educational needs or is the child of an immigrant.

As I will discuss later there is a point in developing *some form* of model that describes the interaction between social worker and a child in need; that the loose models that are suited to the work of ICS needs to be supported with something more flexible than windows-based forms, relational database systems and programming technologies such as PHP or Java which are more suited to business systems³⁶.

9.3 DCSF as a Proxy Customer and Developer

The role of the DCSF was an unusual one. It carried out much of the front-end work required of an IT implementation, for example: development of business requirements, development of detailed requirements, specification of exemplars, construction of a process model and construction of a data model. It acted as both a proxy customer standing in for the real customers (the local authorities) and a developer and only left the final implementation of ICS to the local authorities—this is both highly unusual and lead to major problems: first it absolved the DCSF of any responsibility to communicate with an implementor, for example answering questions about detailed functionality; second it diluted the amount of cash available for development: instead of developing a single system that cost £30m it shared the monies out to local authorities who re-

³⁶Throughout the documentation that forms part of the requirement document set for ICS there is the continual use of terms that indicate that a business problem is being addressed, for example ICS requirements are referred to as 'business requirements' and in the DCSF documentation that provides guidance to local authorities on improving the ICS defects are referred to euphemistically as 'business effects'.

ceived amounts in the low hundreds of thousands of pounds for development; and third it made acceptance of a system a more convoluted process than it should have been.

It is clear that the DCSF wanted a common approach to social work with the establishment of what was known as the Common Assessment Framework and the ICS was meant to support this world view. Given this it is paradoxical, to say the least, why a major part of the development of ICS was shifted off to the children's departments of local authorities.

9.4 How Implementation Dominated the Development Process

A point that I make earlier in this paper is that implementation concerns tended to dominate the development of the ICS. This is certainly a consequence in the latter part of the developments of ICS where the DCSF acted as a proxy customer and the local authorities acted as their implementation agent. However, there are a number of other reasons why implementation issues played a major part in the front-end requirements process.

The first reason is that the exemplars were made mandatory; this, in effect directed the developer to a forms/windows based implementation where an overall narrative would be split up into chunks—it would have excluded the two implementations that I describe in Section 8.

The second reason is that in very early documents that concerned the ICS the term 'database' was extensively used. For example in the original Laming report [1] the term occurred 38 times. People who are non-IT developers tend to use this term in a generic way: that it describes a collection of data. IT developers tend to interpret it in a narrower way: as a structured collection of data which implements relationships between entities that which would usually be implemented in a relational database.

The third reason why implementation had a greater role than requirements was that the DCSF also issued some very large technical documents such as a 187 page logical data model and a 202 page process model that, on every page, implied a relational database implementation or, as a very minimum, a record-based database implementation.

9.5 Professionalism and Computer Systems

Social workers are professionals; throughout the requirements documentation, and in the ICS, there is indication that they are not being treated as such. Four examples would suffice to support this:

First, there was a requirement for the ICS that certain processes should have been completed by a certain time and that the system should be reminding a social worker that time is running out. There should have been trust in the social worker to allow them to carry out their own time management and, second, to realize that that every child is different and that professional judgment is needed in decisions about resources required and decisions about the timing of the application of these resources.

Second, the exemplars provided by the DCSF contain many tick boxes that require a yes/no answer. Sample tick box text for the exemplar that describes

the core assessment of a child aged 5 to 10 years include ‘Hearing/vision is satisfactory’, ‘Child eats an adequate and nutritious diet’, ‘Child’s immunizations are up to date’, ‘Child frequently wets the bed’ and ‘Child has had many accidental injuries’. These tick boxes are accompanied by a single text area for narrative text. An approach which takes cognisance of the professionalism of the social worker would have reduced this part of the exemplar to a single text entry area with the associated instructions such as ‘Write notes and evidence of the child’s state of health and their health needs. In doing so consider factors such as the child’s vision is satisfactory, their hearing is satisfactory, whether they frequently wet their bed’ etc. These are shown in Figure 1.

Third, the use of standard forms containing text boxes that are validated with error messages being generated when some violation occurs are, of course, important in industrial systems. In a human-centred system such as ICS it represents a software-implemented judgement on the capability of the individual social worker. The difference with the approach of ICS implementations and mine detailed in Section 8 is that I trust the social worker to complete a document and, importantly, that a managerial system is in place which will ensure any errors are detected, mitigated and learned from.

Fourth, ICS follows a very strict workflow progression; there is no way that this progression could be modified, parts omitted or delayed depending on the professional judgement of the social worker.

9.6 Standardization and Professional Practice

There are many positive aspects to standardisation. It reduces variability in processes such as carrying out an initial assessment, provides a conceptual framework, promotes employment mobility and reduces the cost of IT development³⁷ However, the standardisation that is embodied in the ICS is too rigid and too process-oriented.

There are a number of key events in the life of a children’s social worker and their managers, for example: the preparation of an adoption order for a family court, the development of a care plan for a child, the development of a core assessment, the application of an emergency care order, the revoking of a care order, the allocation of a case worker and the evaluation of a referral. All these events need to be documented and the key to a human-centred system such as ICS is to provide some degree of standardization via the documentation that is produced and not via heavy-duty process models implemented via heavy-duty industrial software.

9.7 Life-critical Systems

There are many systems whose failure will produce loss of life—systems that are used in avionics, patient monitoring and nuclear power station control are

³⁷A good example here is the failure of the C-Nomis system which was intended to chronicle the interaction of young offenders within the justice system. One of the major reasons for the failure of this £600m project was the fact that many functional differences were incorporated in the system reflecting differences in practice between agencies such as local probation departments [4]. It was also true of the Libra system for computerising magistrates courts [2] which went 300% over budget and was 16 years late. The failing project was eventually rescued by a systems developer who produced standard descriptions of the way that magistrates and their staff work.

good examples. There is a considerable literature describing their development, for example [11]. What is not realized is that there are systems that are one level removed from them, where loss of life is an indirect of consequence defects in system development.

One of the first steps that are taken when developing a life-critical system is a risk analysis of the factors that could lead to catastrophic events such as loss of life or physical damage. In the documentation that I have examined from the ICS project there is no evidence of this. I would contend that a risk analysis which started with the proposition that a child's life would be threatened by a system which diverted social workers from their core work would have pointed out many of the problems that have bedevilled the ICS.

At the time of writing (January 2010) we have a system that, while not directly contributing to the loss of life, gives rise to working conditions where computer use dominates normal social work activities. It makes the probability of undetected acts of cruelty and loss of life much more likely.

9.8 The Role of Simplicity

One of the failures of the ICS project that saddened me the most was the failure in not considering simple solutions before moving on to more complicated solutions. A simple solution, augmented with some sensible manual processes arising from a sensible organizational and managerial model, would have been cheaper, more transparent and removed a lot of the grief that children's social work is currently experiencing.

9.9 Education and the Software Engineer

Many staff who work on software projects emerge from computing degrees. A central component of such degrees are courses on software development: a student will learn about programming in the first year and then, in later courses, learn about important development practices such as requirements analysis, requirements specification, system design, implementation and validation. These are courses well suited to the development of systems where there is a strict chronology; they are ill-suited to human-centred systems such as ICS which consist of a broad chronology in which a large degree of variability is encountered.

The development of systems such as ICS falls into the intellectual cracks between such technical courses and other courses that are found in undergraduate computing degrees, for example courses on the human-computer interface. If a university computing department wishes for its teaching to be comprehensive then it will need to address this weakness and instill in its students a view that heavy industrial systems development should not *automatically* be used for every system.

The education of future software engineers should also take cognisance of the point I make in Section 9.7 that there is a broader idea of what a life-critical system is compared with the current orthodoxy. It should also take cognisance of the point that I made in Section 9.8: that before reaching for the UML editor a software developer should consider simpler solutions that employ existing software which has much of the embedded functionality that is required for an application.

9.10 Building on Existing Functionality

The examples that I give in Section 8 show that you can build on existing systems for implementation. Indeed, not only a *Word* or *MediaWiki* solution would have satisfied the requirements for the system, but other systems such as content management systems could have been used if, for example, some computer-based processes were replaced by manual processes. This is a result of the poor requirements analysis which I allude to above which, in mandating a set of exemplars and publishing a 187 page data model and a 202 page process model, effectively cut off creative and cheaper system development using existing functionality embedded in software such as word processors and content management systems.

9.11 Human-centred Computing

The last five years has seen a trend in computing to establish a discipline of human-centred computing. See [18] for an introduction to this area; it includes the paragraph

Unfortunately, the changes are not always positive, and much of the technology we use is clunky, unfriendly, unnatural, culturally biased, and difficult to use. As a result, several aspects of daily life are becoming increasingly complex and demanding³⁸.

and defines Human Centred Computing (HCC) as:

...a set of methodologies that apply to any field that uses computers in applications in which people directly interact with devices or systems that use computer technologies. The field is emerging from the convergence of multiple disciplines that are concerned both with understanding human beings and with the design of computational artifacts. HCC researchers and designers have a range of backgrounds and interests, from computer science, sociology, psychology, and cognitive science to engineering, graphic design, industrial design, and so on.

HCC has a wide remit; it includes research which for example, examines the interaction of humans with ubiquitous devices [10], the vocabulary of human interaction with the computer [16] and computer-supported cooperative work [15]. The establishment and growth of this discipline is, of course, welcome: for example, the area of computer-supported cooperative work has plenty to say about the mediated nature of interactions between technology and individuals who are collaborating with each other and how the computer can help and hinder. However, the problems with ICS arise from an organizational decision and a consequent problem with requirements analysis.

The DCSF decided to act as both a proxy customer and a front-end development team and left the implementation of the system up to the local authorities—often by buying in a software package. What this did was to erect a huge barrier between the eventual user and the implementor. It prevented any feedback on performance, technical capabilities and on whether ICS was fit

³⁸This sentence could quite easily have been written about the ICS.

for purpose—it very effectively prevented any mid-term corrections during implementation. Requirements analysis is still an iterative process and even if the procedures described by the Secretary of State in Section 4 of this article were followed then there would have to have been considerable feedback required.

The barrier between the proxy customer and front-end developer (the DCSF) and the implementors and users prevented any feedback as the documents produced by the DCSF were regarded as final—even feedback informed by HCC would not have helped. The result of this was that, in a minor way, the implementors became victims and, in a major way, the social workers became victims to the point where they have much more familiarity with the computers they use than the children in need they have responsibility for.

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