Innovation, exnovation and intelligent failure

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Innovation, exnovation and intelligent failure

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Introduction: the failure to discuss innovation failure

When it comes to innovation, failure is—or at least should be—a given. By its very nature, innovation involves risk and unpredictability, in both processes and outcomes. Whether occurring in the private, public or voluntary sector (or in hybrid organizations), innovation can involve the creation, testing, implementation and diffusing of new ideas, concepts and solutions. At any stage along this innovation pathway things can go wrong. Public services in particular may have to contend with additional risks of failure, because services which are under state governance are often inherently contested and controversial, must cater for a range of citizens and users rather than just a limited set of ‘customers’, and often face greater scrutiny of their innovations and the associated risk-taking from the media, citizens and communities.

But how far is failure discussed analytically in the innovation literature? This article examines innovation and its failure, especially ‘intelligent failure’ (Sitkin, 1992) and considers how the risks of failure can be mitigated or managed, leading to valuable organizational learning and innovation success. It also explores one particular approach to addressing failure—the deliberate killing off of an innovation—for which Kimberly (1981) coined the term ‘exnovation’. In addressing these questions, this article draws on innovation literature from all sectors but critically applies ideas to public governance and public services in particular, taking account of the distinctive context and processes of the public sector (Hartley, 2013; Fuglsang & Møller, 2020). The methodology is an essay, drawing on the authors’ earlier writings, including literature reviews, but also wide reading across private and public sector literatures to bring novel insights and questions to understanding failure—most particularly intelligent failure—in innovation. In consolidating insights from these apparently disparate sources, this article provides a clear elucidation of key conceptual links and, in so doing, offers new insights for both researchers and practitioners of innovation in the public sector.

The lure of innovation

As a starting point, we might consider why there is so much interest in innovation but—in relative terms—so little in innovation failure? Innovation sounds so exciting, different and transformational that it attracts considerable interest. After all, who can be against something which is new, shiny and modern? In the private sector, there are many exhortations to innovate because it is ‘the new imperative’ (Chesbrough, 2003), a perspective which echoes the advice from, reputedly, Peter Drucker to ‘innovate or die’. This interest in innovation has been echoed in public services policy, practice and scholarship (Jordan, 2014; Borins, 2014). Innovation is, as Osborne and Brown (2011) note, ‘the word that would be king’ for public services. In the context of public service reform and/or austerity measures, innovation has the implied promise of something newer and often cheaper (Kiefer et al., 2015).

There are, however, strong reasons to retain a questioning approach to innovation for public services. Meijer and Thaens (2020) argue that insufficient account has been taken of the...
‘dark side’ or negative effects of public innovation and that there is a need for a more critical approach. Equally, while there is a large research literature on innovation, there is also ‘speculation and wishful thinking’ (Kimberly, 1981, p. 84). We suggest this includes overlooking the true nature of innovation failures and indeed we argue that the question of failure in the context of innovation is underdeveloped: as Danneels and Vestal assert, ‘there is very little research to support the growing calls to embrace failure’ (2020, p. 1).

The omission by many textbooks and handbooks on innovation to index ‘failure’ is both striking and informative. Similarly, there is only a small literature about failures on the path to success or failures stemming from serendipity. This, at least, is a reminder that innovation, however well described as having linear stages, is often emergent, cyclical or unplanned (Van de Ven et al., 2000; Bason, 2010).

There is a distinct literature about wider organizational failure (Baumard & Starbuck, 2005). Claims abound concerning failure rates in organizations, often without context or clarification. This includes such assertions that 66% of change initiatives fail (Sturdy & Grey, 2003, p. 651) or that 50–90% of strategy execution initiatives fail (Cândido & Santos, 2015). Claims about public services are similar. The veracity or otherwise of these and similar assertions has been discussed elsewhere (for example Hughes, 2011). Ultimately, however, the analysis of innovation failure remains slim. This article argues that failure is intrinsic to innovation and that certain types of failure can be harnessed in intelligent ways. Before we get to that point, however, it is valuable to reflect on the key concepts of innovation and failure.

Defining innovation and defining failure

Innovation has been widely studied but there are variations in definition. Public innovation scholars have, nonetheless, broadly converged on a number of agreed characteristics which are set out here to ensure common understanding for the purposes of this article. From this perspective, innovation is about new ideas or practices which are implemented—innovation does not therefore cover just the creative stage (Bessant, 2005; De Vries et al., 2016). Innovation is not any type of change or newness; it is a disruption—whether a step-change (Lynn, 1997; Osborne & Brown, 2005; Hartley, 2005) or more incremental (Fuglsang, 2010; Fagerberg et al, 2005). A step-change in this regard is not necessarily a major or large-scale change, rather it can simply be a specific break with established practices based on a different approach or mindset (Sørensen & Torfing, 2011). The degree of innovation change is at least partly subjective and, socially constructed (Greenhalgh et al., 2004). Roberts and King (1996) note that innovation involves change in a new location (for example organization, context) and does not have to be uniquely novel. Finally, an innovation is not necessarily successful (Borins, 2008), despite the pro-innovation bias of much of the literature (Lynn, 1997). Consequently, separating innovation from success enables us to examine ‘success’ and ‘failure’ more analytically.

The context blind nature of innovation studies

Historically, innovation studies were context blind, with public services innovation overly reliant on models from the private sector (De Vries et al., 2016). That is now changing, with greater recognition of many distinctive aspects of public innovation (Hartley, 2013; Windrum & Koch, 2008). While ‘publicness’ is a continuum not a dichotomy (Bozeman & Bretschneider, 1994), there are different institutional logics for innovation in private compared with public sectors (Fuglsang & Møller, 2020). As noted by these and other scholars, key features of public service organizations include the role of politicians in addition to managers in innovation; the role of citizens and not only ‘customers’; the benefits (and disbenefits) of an innovation being to society and therefore the importance of creating public value and not just accruing value to the individual firm (organizational performance is consequently not the only or best measure of innovation success for public organizations); the value in sharing and spreading innovation across services and society rather than trying to protect innovation for competitive advantage; and the contested nature of many public services, with different stakeholders holding views about the innovation not only customers and suppliers. Public innovation also takes place in the glare of public scrutiny; comment and debate and cannot (generally) be kept under wraps until its launch.

This public scrutiny and the ever-changing requirements of various stakeholders may also account for the often highly fluid and dynamic nature of public innovations. Demographic changes, variations in service-user needs and expectations, and the ripple effect of unintended consequences can have significant impacts on the longer-term relevance, applicability and feasibility of innovations. What is regarded as a useful innovation today might be the subject of a public enquiry or an electoral backlash tomorrow. It is important to recognize the distinctive aspects of many public innovations so that judicious and relevant use can be made of insights from private sector organizations and innovation, while also noting differences.

Defining failure

Turning attention to the concept of failure, a significant challenge for discussion lies in its definition. McGrath proposes that ‘failure is the termination of an initiative that has fallen short of its goals’ (1999, p. 14). While some failures may be very clear (for example a death in custody or errors in laboratory testing), others have elements of subjectivity and social construction, raising further questions, such as who defined the goals against which failure/success are measured; what is the nature of those goals; and were those goals reasonable to begin with?

An understanding of failure consequently entails the acceptance of a significant degree of ambiguity and the realization that failure can be contextual. This is highly relevant when considering failure in the public compared with the private sector. For a private organization, goals will typically be defined by a manager or management team and often in terms of financial measures, market share or market positioning, within the organization’s overall strategy. Stakeholders may often be primarily internal or partners in the supply chain. The decision to terminate an innovation is likely to be internal, based on progress against objectives and strategy.

In a public service organization, the situation is likely to be differently configured. Operational goals may be defined by a
manager or management team, though are likely to be set in the context of the law, regulations and policy goals from central, devolved or local government, which in turn may be influenced by a range of global, national or local factors and political pressures. Public service goals are often broad as they tend to focus on outcomes for society rather than solely organizational measures, so innovations aim to create public value (Benington & Moore, 2011; Bason, 2010) rather than private value (Hartley, 2013). Public goals attract comment from the media, politicians, citizens and communities, with outcomes often evaluated differently. Importantly, some goals, particularly preventative goals, can be difficult to measure and may, moreover, be subject to political pressures, external regulatory scrutiny and subjective judgements. The picture of what constitutes a failure to achieve goals is consequently often contested. Vincent (1996) notes that public service organizations face greater scrutiny of their risk taking and their failures than private firms.

While innovation and failure appear to be distinct concepts and have varying understandings and implications across sectors, they are nonetheless inherently linked. One key approach to understanding this nexus is encapsulated by Sitkin’s (1992) concept of intelligent failure.

**Intelligent failure**

Sitkin (1992, p. 243) argues that while failure must not be pursued for its own sake there are nonetheless certain types of failure which are safety- and survival-enhancing, and allow risk to be more effectively managed. These failures, Sitkin argues, are intelligent failures; in other words, those ‘failures that are most effective at fostering learning’ (Sitkin, 1992, p. 243).

**Characteristics of intelligent failure**

In developing the notion of intelligent failure, Sitkin (1992) outlines five closely interlinked characteristics. First, and perhaps most importantly, intelligent failure arises from thoughtfully planned actions. Intelligent failure is not, in this regard, haphazard, accidental or malign, but reflects carefully considered and often detailed plans and scenarios which can be used to inform subsequent activity. Planning is crucially central to intelligent failure—it is not a post hoc interpretation of what has happened. Second, the likely or intended outcomes of the actions should be uncertain. This sounds counter-intuitive, but if the outcomes are already highly predictable then there is no new information or learning to be gained and no need to risk failure. Third, the failure should be modest so that the potential scale or impact of the failure is both managed and manageable—an important consideration given the threat, harm and risk context of some public services. Fourth, if failure occurs it should be dealt with quickly and efficiently. It is not left to linger as doing so might heighten any potentially negative impact. Finally, it is crucial that any failure should occur in a sufficiently familiar context so that effective learning can take place. By ensuring that failure takes place in a context which is to some degree known and understood, other factors impacting on the process can be diagnosed and understood. Intelligent failure, overall, is a kind of careful and well thought through form of experimentation.

McGrath (2010) subsequently proposed two additional characteristics of intelligent failure which extend and build upon Sitkin’s (1992) initial theoretical conceptualization. Specifically, she argues that in the planning stage any assumptions underlying the process should be explicitly clarified and shared. Further, McGrath recommends that these assumptions are tested at ongoing and agreed points to ensure that any divergence from planned outcomes is identified as soon as possible. McGrath’s points link respectively to the first and fourth characteristics initially outlined by Sitkin.

When managed effectively, intelligent failure aligns with Argyris and Schön’s (1978) notion of double-loop learning. Rather than simply establishing the facts of what might or might not have happened and those elements that might have contributed to failure, Argyris and Schön (1978, pp. 2–3) emphasise that ‘Double-loop learning occurs when error is detected and corrected in ways that involve the modification of an organization’s underlying norms, policies and objectives’ (1978, pp. 2–3).

Some parallels can also be drawn between the key elements of intelligent failure and what Shergold (2015) has termed ‘adaptive government’: ‘Adaptive government calls for greater organizational flexibility. It demands more willingness to experiment—starting small, testing what works and (in the worst case) failing quickly’ (p. xi).

Rather than being prescriptive, these various characteristics are useful for highlighting how failure might be looked at differently by taking an intelligent failure approach where this is feasible. Each context is likely to be different and so varying requirements to explore assumptions and extract learning will come into play. This will ultimately support a recognition for greater flexibility in approaches over time, not just within public services generally but also at the level of organizations and teams. More broadly, it also highlights that an intelligent approach to failure has key benefits for both private and public sector organizations as they grapple with the risks and the challenges of failure.

**The paradox of an intelligent approach to failure**

The apparently paradoxical nature of intelligent failure is captured effectively by Sitkin (1992) when he argues that:

> It sounds like Orwellian ‘doublepeak’ to say ‘failing is good’. But a closer analysis of the problems associated with success suggests why the seeming counterintuitive may be advisable. Where success can foster decreased search and attention, increased complacency, risk aversion, and maladaptive homogeneity, modest levels of failure can promote a willingness to take risks and foster
resilience-enhancing experimentation—benefits that complement the liabilities of success (p. 237).

In other words, as Farson and Keyes (2002) suggest, success and failure are not so much rivals as siblings, a point hinted at by Harford (2011, p. 35) when he asserts that ‘distinguishing success from failure, oddly, can be the hardest task of all’. This is partly because failure can lead to cover up, denial or enhanced risk aversion. An inability to learn from experience—and particularly failure—can doom a service or organization to repeat the same mistakes over and over with minimal improvement, or even awareness of opportunities to improve.

Taxonomies of failure

Consequently, not all failures are equally valuable for an organization (whether public, private or third sector). Edmondson (2011) proposes a taxonomy of reasons for failure in organizations that helps to identify whether a failure has value to the organization, and she outlines strategies for learning from different types of failure. Edmondson’s framework is a spectrum of reasons for failure, which range from those Edmondson considers to be ‘blameworthy’ where an individual recklessly or willfully chooses to violate an agreed process or practice through to, at the other end of the spectrum, those she calls ‘praiseworthy’. These latter failures are based on thoughtful experiments to expand knowledge and investigate possibilities, even if they eventually result in failure and indicate a link to Sitkin’s (1992) concept of intelligent failure.

In constructing this spectrum, Edmondson asserts that failure in organizations can typically be classified as one of three types: ‘Preventable failures in predictable operations’, ‘Unavoidable failures in complex systems’ or, echoing Sitkin, ‘Intelligent failures at the frontier’ (Edmondson, 2011, pp. 50–51). Innovations may involve failures in this last category, though whether sufficient learning is extracted is a different question.

Edmondson’s approach was adapted by Tomkins et al. (2020) who applied this taxonomy to public services by examining reasons for failure in a large police organization. Tomkins et al. found that deviation or inattention were reasons for preventable failure; lack of skill or ability, and task complexity or unpredictability were reasons for tolerable failure; and innovation was a reason for intelligent failure. More specifically, Tomkins et al. argue that intelligent failure is a factor in innovation when there is ‘an appetite for exploration and experimentation, where failures are seen as valuable sources of data’ (2020, p. 100). This occurs when a culture of ‘promising practice’ is encouraged and the ‘possibilities for innovation are collectively debated’ (Tomkins et al., 2020, p. 100).

These ideas about intelligent failure, distinguished from other forms of failure, have been put into practice by the Metropolitan Police Service—the UK’s largest police service. Based on the work of Tomkins et al. (2020), the ‘Met’ has expressed these ideas about different reasons for failure on a small card, which can be carried behind the warrant card of all police officers. By specifically highlighting that failures in innovation can be praiseworthy, this cultural artifact (Schein, 1997) is shaping this police service’s approach to individual and organizational learning. The card details are shown in Figure 1.

As this example from the Met demonstrates, while intelligent failure might at first appear paradoxical, when it is contextualized and compared with other forms of failure, clear practical benefits can accrue for organizations seeking to implement thoughtful experimentation.

Active experimentation while addressing risk

Intelligent failure is based on active experimentation in order to learn and improve, but it should nonetheless be recognized that organizations can vary substantially in their attitude toward experimentation and risk. Thomke and Manzi (2014, p. 72) argue that: ‘A pharmaceutical company would never introduce a drug without first conducting a round of experiments based on established scientific protocols… Yet that’s essentially what many companies do when they roll out new business models and other novel concepts’. This observation can also be applied in the public sector, where policy announcements sometimes precede the innovations required to support them (Hartley, 2013).

On the other hand, public service organizations have tried to address some aspects of the risks of innovation through active experimentation using pilot programmes, pathfinder initiatives and beacon schemes (Cabinet Office, 2003; Hartley & Rashman, 2018). These can maximize learning and minimize risk in innovation before wider rollout. As Golden (1997, p. 171) notes, once a public innovation is in train, often ‘the manager is trying to learn quickly from experience and is greedy for information—information that is reliable, relevant to the real problem, highly detailed, reasonably comprehensive and available quickly’. Muoio et al. (1995, p. 233) are clear that, at least in theory: ‘Every pilot project can be a win-win situation because information is systematically obtained on feasibility, adequacy, and completeness of the item or issue being piloted’. The Cabinet Office (2003) reports, however, that some pilots, pathfinders and other initiatives and schemes are sub-optimal due to lessons not fully being learned prior to national ‘roll-out’ or decisions to go ahead regardless of what is being learnt about practicalities. This is experimentation without organizational learning which can be highly risky for organizations, citizens and communities.

Risk aversion and experiment aversion

While the notion of organizational risk aversion is well known (Farson & Keyes, 2002), less well-explored is the concept of experiment aversion—a tendency to minimize risk through the avoidance of experimentation and possible further or different risk (see also Bovaird & Quirk, 2017). Ariely (2010) attributes this partly to some policy-makers and managers preferring to trust experts and expert intuition over evidence, along with the fear of suffering short-term losses in order to achieve long-term gains. It is not surprising that there is a plethora of scrutiny bodies overseeing the practices of public service organizations or that public services will often shrink from risk and active experimentation in this context.

Yet, just as experimentation and learning are central to intelligent failure, so, too, is more effective engagement with risk. This is a major issue for public services, where the challenges associated with managing risk and the dangers of risk are often heard as an argument not to innovate or
change existing practices (Lodge, 2009). Indeed, Osborne et al.’s (2020) empirical research found ‘limited appreciation that risk was an inherent part of the innovation process’ (p. 58). This risk aversion can be due, at least in part, to the reality that some public services deal with life, death, liberty and/or quality of life for citizens. Brown and Osborne (2013) note that risks may occur to individuals (for example careers damaged by a mistake); to organizations (for example the legitimacy and reputation of an organization or a professional association); and to the wider community (mortality at worst if mistakes occur).

**Alternative ways to address risk**

However, there are alternative ways to address risk. Brown and Osborne (2013) refer to the work of Renn (2008) who notes that the traditional approach is risk minimization, whereby risk is avoided or reduced through anticipatory processes (extra procedures, additional checks): something which can be antithetical to certain aspects of innovation. This approach is largely based on the idea that the risks are both known and knowable—something that might potentially occur in a certain and stable world, but which can be challenging in reality (Taleb, 2008) and particularly given that innovation outcomes cannot be fully knowable, especially in complex systems. A second approach is to focus on risk analysis, recognizing that risks cannot be fully avoided. Detailed understanding of consequences is, therefore, needed so that negative outcomes can be constrained and managed. The third approach recognizes that many aspects of public services operate in conditions of uncertainty, where the risks are not known and cannot be fully comprehended and so Renn (2008) argues for a different approach, namely ‘risk governance’. This takes account of the fact that risks may have benefits as well as harms, so encouraging experts and society more widely to negotiate the amount of risk considered to be acceptable. Renn summarises this as a shift from ‘how safe is safe?’ to ‘how much uncertainty and ignorance [about risks] are the main actors willing to accept in exchange for some given benefit?’ (2008, p. 277). An intelligent failure approach suggests the value of the second and third approaches to
risk in particular, given the inevitable uncertainties associated with innovation. Meijer and Thaens (2020), in their analysis of how to address negative aspects of innovation, also argue for debate and discussion to explore how different approaches can be weighed up.

The sharing of experiences of innovation or failure across a service or sector can reduce the political, service and organizational risks of innovation—a process which applies both within the public sector and between the public and private sectors. The diffusion or sharing of innovations is a highly valuable element of public services innovation (Hartley, 2013). Research on sharing innovations in local government has found that an innovating local authority reduced the risks for second and later adopters because the political and service risks had already been taken (Rashman et al., 2005). In addition, as local authorities shared their experiences of innovations, the ‘learner’ local authorities were just as interested in the failures and cul-de-sacs as they were in the successes (and were, in fact, often sceptical and demotivated by simple success stories). This approach enabled them to understand at a deeper level how the innovation had been achieved and, therefore anticipate and manage risk for their own organizations (Hartley & Rashman, 2007). Molnar et al. (2018) refer to similar approaches to risk and learning between policing bodies as they prepare for major events in a process they refer to as ‘failure-inspired social learning’ (p. 109). Diffusion or sharing can consequently enhance learning, reduce risk and help to manage uncertainty.

**Developing a responsible risk culture**

Although active experimentation with its attendant risks is not easy, Bovaird and Quirk (2017) argue for an acceptance by public organizations of the inevitability of certain failures as a key way of minimizing their potential downside, leading to what they term ‘the transformative potential of a responsible risk culture, based on proportionate rather than over-cautious responses to risk’ (2017, p. 258). Furthermore, to mitigate risk, Thomke and Manzi (2014) propose a five-area framework and checklist to encourage experimentation practices and culture. The initial model focuses on commercial organizations but this article has fruitfully adapted it for public organizations. The adapted checklist is shown in Table 2.

<table>
<thead>
<tr>
<th>Purpose</th>
<th>Does the experimentation focus on a specific policy area, management action or stakeholder aspiration under consideration?</th>
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<tbody>
<tr>
<td>Buy-In</td>
<td>What specific changes would be made on the basis of the results?</td>
</tr>
<tr>
<td>Feasibility</td>
<td>What is the required sample size?</td>
</tr>
<tr>
<td>Reliability</td>
<td>What indicators and measures will be used?</td>
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<tr>
<td>Value</td>
<td>In what ways will public value be created?</td>
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Overall, active experimentation can help public organizations engage more effectively with risk. A real challenge arises, however, when the downsides of innovation are encountered in practice and where divestment or cessation ought to be considered, which is where exnovation may be important.

**Exploring the link between failure and exnovation**

Drawing on the concept of intelligent innovation this article has, so far, focused on the value of active experimentation. We now turn to consider what organizations can do when innovation failures occur. Some of these failures may be intelligent (thoughtful experimentation) but others may occur for a variety of reasons, including the emergence of unintended consequences through innovation implementation or the difficulties of taking an innovation from pilot to full scale. The value of innovations may also change over time, for example due to changes in society, changes in politics or changes in stakeholder expectations.

There are a number of ways in which failures can be reviewed and evaluated, beyond those already advocated through intelligent failure and active experimentation. Practices such as the After-Action Review (McGrath, 2017) (utilized by certain public services) or the more detailed and structured Return on Failure assessment model of Birkinshaw and Haas (2016) can both be usefully employed because they each focus on learning, understanding and implications rather than blame or retribution. The role of a questioning and enquiring leadership is also valuable in encouraging curiosity and planned experimentation from the workforce rather than a fear of failure (for example Farson and Keyes (2002)).

While in themselves these processes can be useful for learning from failure, they can only ever be a support for decision-making rather than being the decision-making itself. When failure has occurred, decisions may be needed to continue or discontinue the initiative. It is in this nexus that we find the link between innovation, failure and exnovation.
Understanding the concept of exnovation

The concept of ‘exnovation’ was coined by Kimberly (1981) and describes ‘the process whereby an organization decides to divest itself of an innovation that it had previously adopted’ (Kimberly & Evanisko, 1981, p. 710). Kimberly (1981) and others (for example Rodriguez et al., 2016; Heyen et al., 2017; David, 2017) show that exnovation is not the opposite of innovation but can be integral to it. It should be noted that exnovation can occur without failure but that can be a reason for deploying it.

Exnovation occurs at a turning point (sometimes painful/sometimes a relief) where resources have been invested, stakeholders brought on board, political capital often expended, organizational practices modified, training undertaken and so forth. Where once there was a commitment to a particular innovation, exnovation now means that the decision is made to substantially or completely reverse that decision. While Kimberly locates this process in an organizational framework, for public services this decision may additionally result from a shift in government policy, a change of government or a reformulated sectoral budget.

Alternatives to exnovation

Importantly, exnovation is often a difficult decision both to make and implement (David, 2018). There are various ways in which organizations press on with the innovation despite the tacit—or even explicit—recognition that it is no longer fit for purpose or even failing. First, an innovation may be ‘doomed to success’, a phenomenon recognized by many public service practitioners and often occurring where an innovation is known to be failing but no attempt is made to address the situation. This may be because the failing innovation is a key stakeholder’s pet project so to drop the innovation—or even to raise the idea of curtailing it—would involve losing face (particularly for ministers or managers). This can lead to a situation of escalating commitment, well analysed by Staw (1976) and by behavioural economists: a case in which the sunk costs outweigh—psychologically, socially and professionally—the perceived benefits of changing the decision.

Second, either on its own or compounded by the first, there may be stakeholders and power blocs who have too much to gain from the status quo even if dysfunctional overall—whether those gains are in resources or reputation. Bardach (1976) calls these ‘anti-termination coalitions’ and argues that we should therefore think of the termination or curtailment of a policy or programme as a political process not just an evidence-based process.

A third approach is to keep the innovation ‘on the books’, but quietly ignore it. Such an approach might result in workarounds or the substitution of other approaches without removing the original innovation. This leads to archaeological layers of policy and practice innovations where new language or new practices are introduced as innovations but without earlier innovations being withdrawn.

Processes which support innovation

While these approaches can make exnovation difficult, there are also active and explicit techniques to recognize the failure or non-fulfilment of an innovation which can better inform decision-making. For example, ‘stage-gate’ models (for example Cooper, 1988) help to identify key stages in the progression of an innovation from an idea to implementation (Albury, 2005) and help decision-makers assemble data to decide whether progression to the next stage of development of the innovation is justified or not. The ‘gate’ puts an end to the innovation if the evidence does not warrant continuation and it links to a key stage of Sitkin’s (1992) intelligent failure approach, namely—and as noted above—that failure should be dealt with quickly and efficiently. Such techniques may partly account for the high level of innovations which fail at some point along the pathway between original idea to launch (Tidd et al., 2018). Crucially, however, the underlying assumption and logic of stage-gate models is that, once the innovation has passed through the final stage-gate, then the product or service is seen as successful and is ‘launched’. Further evaluation may not be undertaken as the innovation is deemed a success.

The difficulty can be that, as noted earlier, innovations and their contexts are often dynamic—changes in populations, innovation use or expectations, and unintended consequences can mean that an innovation is initially valuable one day but declines in value over time, sometimes even overnight. Observant politicians, managers, professionals and citizens may identify problems and failures. An adaptive organization (Shergold, 2015), or failure-tolerant leaders (Farson & Keyes, 2002) may handle failures skillfully (Cannon & Edmondson, 2005) but not all organizations have this kind of leadership and culture.

Other benefits of exnovation

While exnovation can sound as though it is primarily about killing off innovations that are no longer fit for purpose, crucially, exnovation may also serve other goals. A key insight from Kimberly and Evanisko (1981, p. 710) is that: ‘the adoption of one innovation may be made possible by another’s exnovation’.

In other words, if managed effectively, innovation and exnovation can be two sides of a coin—each facilitating the other in organizational and policy settings.

How can this be? It is helpful to recognize that there can be a problem with too much innovation in a service, sector or country. With the pro-innovation bias in general, and with new governments often keen to show off their credentials through innovative new policies promoted rapidly, often as aspects of public service reform, hyper-innovation (Moran, 2003) can flourish. This is, where there is so much innovation enacted concurrently that it is difficult for policy-makers and practitioners to focus on or sustain innovation, or where different innovations counteract and undermine each other.

By implementing exnovation and consciously allowing for intelligent failure through planned experimentation, the space for further contemporary innovation can be created. For example, Heyen et al. (2017) found that a focus on exnovation in coal-fired plants in Germany enabled the state to direct more resources and actors to develop green power industry innovations, which were more sustainable for the climate in the longer-term.

Importantly, however, exnovation is not necessarily a simple rational process. Bardach (1976) noted, in line with a view of
The relationships between intelligent failure in public compared with private contexts.
The behaviors of intelligent failure, organizational learning and organizational performance.

<table>
<thead>
<tr>
<th>Research area</th>
<th>Importance</th>
<th>Potential benefits to policy and practice</th>
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<tr>
<td>Processes and outcomes of intelligent failure in public sector organizations</td>
<td>Currently under-researched—could provide rich data to understand intelligent failure Is intelligent failure easier or harder to action in the context of incremental rather than radical innovation, and other dimensions of innovation?</td>
<td>How to practice intelligent failure in the context of risk and public scrutiny Could help with planning innovations in particular contexts through deeper understanding of intelligent failure Better balance between initiating and killing off innovations, leading to more realistic organizational change. Support the development of more effective policies and processes to create effective exnovation Enhance policy and leadership effectiveness Enhance decision-making effectiveness at an organizational and sector level Support greater understanding of the impact and nature of failure in a public policy context Support the development of better organizational processes for organizational learning from innovation failure and using that learning productively</td>
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<tr>
<td>Dimensions of innovation and intelligent failure</td>
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<tr>
<td>Drivers and blockers of exnovation</td>
<td>To understand when, how and why exnovation is considered and enacted</td>
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<tr>
<td>Key processes of decision-making in intelligent failure and exnovation</td>
<td>To understand aspects of decision-making processes and decision-makers, including rationality and politics</td>
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<tr>
<td>Intelligent failure in public compared with private contexts</td>
<td>To gain greater insight into responses to failure in varied contexts and degrees of publicness To understand whether intelligent failure always leads to useable learning. And does that learning lead to improved organizational performance?</td>
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<td>The relationships between intelligent failure, organizational learning and organizational performance</td>
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Table 3. Suggested areas for further research.

The challenge of exnovation

Exnovation may not be easy. But if failure is conceptualized as providing important signals and learning about processes and impacts which create or impede public value creation for the wider good of society, then exnovation becomes a somewhat easier process with which to engage. This may be particularly so if exnovation occurs in a context in which intelligent failure is consciously practiced. By combining the two approaches, organizations may be able to optimize the value of public innovation failure, in order to create learning and through that contribute to innovation success.

However, as noted earlier, there is a relative lack of research on innovation failure, and particularly intelligent failure, and little research on exnovation outside the technology sector. So this article concludes with some suggestions for a future research agenda. There are many areas about which to build evidence and understanding, to inform policy and practice. We suggest a small number of promising avenues in Table 3. Both case studies and surveys could help to furnish researchers, policy-makers and practitioners with insights which will help them improve innovation and exnovation processes.

Conclusions

This article has examined the complex and contested relationship between innovation and failure as applied to public services. It uses literature from the private and public sectors to do so—in a critical way which recognizes both similarities but also important differences between sectors. In considering public service innovation and failure, we highlight two core concepts: intelligent failure (Sitkin, 1992) and exnovation (Kimberly, 1981). While superficially innovation, intelligent failure and exnovation might appear to be odd bedfellows, the taxonomies of failure developed by Edmondson (2011) and Tomkins et al. (2020) help to elucidate why each is concept can be valuable in fostering learning and in creating adaptive, successful innovations. We further argue that understanding these two concepts of intelligent failure and exnovation also aid the understanding and effective management of risk—itsel never an easy issue for public services—which can lead to more well-planned public service innovation and outcomes.

Disclosure statement

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