

Reducing the gap between rhetoric and reality: Use of Digital Service Standards for public service innovation through digital transformation in Australia

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Abstract

Nearly a decade ago, the Australian Federal Government introduced a Digital Service Standard (DSS) for new and redesigned government services. This was an opportunity to encourage digital services and disruptive innovations to help the government improve citizens outcomes, and indeed there was a significant uptake in the digital services assessments offered by the program with key government agencies across health, human services, taxation, and education on board. However, by the 2020s the number of publicly visible assessments had significantly reduced. The initial broad adoption and recent reduction in numbers present an opportunity to explore the effectiveness of this government innovation management program that was ahead of its time. This paper reviews the impact of the DSS in fostering public service innovation and presents lessons learnt from the program. To perform this analysis, this research evaluates to what extent the DSS applied common private sector innovation management approaches of Innovation Process Management and Innovation Portfolio Management in the public sector. It also looks at the impact of these programs in encouraging specific

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types of modern digital innovations. The analysis draws on DSS assessments from 2015 to 2021 and considers how the program demonstrated public sector innovation leadership. This paper proposes a framework to improve the DSS by tailoring its approach for new and existing services, adopting specific standards to encourage incremental and disruptive innovations, and promoting more transparent reporting and funding of innovation management programs. This evaluation found that the DSS exemplifies Innovation Process Management in its use of stages and gates, and Innovation Portfolio Management in its use of targeted assessment criteria across innovation portfolios of various government agencies. The analysis also identified design limitations in the DSS as a whole of government innovation management approach due to its limited uptake in multiple large agencies and lack of specific standards to encourage different types of innovation. The impact of this research is to increase the adoption of the DSS and increase the innovation outcomes delivered by this government program. We conclude by reflecting some of the unique considerations in applying private sector innovation management practices in the public sector.

KEYWORDS

digital transformation, innovation management, portfolio management, process management, public sector innovation

Points for practitioners

- Innovation management techniques are emerging but remain immature in the public sector.
- Australia has shown leadership in Government Innovation Process and Portfolio Management.
- Government must remain committed to innovation management programs and sharing the outputs of these programs.
- Government Innovation Management Programs should build in flexibility to encourage different types of innovation.

1 | INTRODUCTION

1.1 | The importance of public sector innovation

Innovation is a highly topical and heavily studied area of modern times with much focus amongst government, the public, industry, and academics (Al-Noaimi et al., 2022; Dodgson et al., 2013; Fagerberg et al., 2005; van der Panne et al., 2003; van der Wal & Demircioglu, 2020). For corporate executives, innovation is commonly seen as a top priority (Guo et al., 2017; Tang et al., 2015). Throughout the academic world, the interest in innovation has led to over 1000 papers published on the topic per year since the early 2000s (Crossan & Apaydin, 2010). The topic has gained momentum throughout the 20th century, with innovation identified as a driving force in national development (Schumpeter, 1942); the Organisation for Economic Co-operation and Development estimates that innovation accounts for up to 50% of economic growth (OECD, 2015). Contemporary studies have identified innovation as one of the most important determinants of organisational performance (Mone et al., 1998) and ingrained in the mindset that organisations must innovate or die (Drucker, 1985).

Within this realm, public sector innovation management is important because government delivers key services to citizens and represents a major component of national economies (Bason, 2010; Sørensen & Torfing, 2011). Traditionally, the public sector has struggled to innovate and more often been unsuccessful as *'innovation often gets derailed'* (Eggers & Singh, 2009, pp. 6–7). One major challenge has been the perception that *'innovation in the public sector is an oxymoron'* (Bommert, 2010, p. 15). Beyond this perception issue, public sector innovation is also hampered by risk aversion (Roszkowski & Grable, 2009) and bureaucratic hurdles (Osborne & Plastrik, 1997), although attempts to solve *'wicked'* societal challenges (Rittel & Webber, 1973; Schad & Bansal, 2018) warrant disruptive innovations and new ways of thinking to address such problems. However, constraints on government expenses in economic recessions (Makkonen, 2013) and fiscal pressures to do more with less (Mulgan & Albury, 2003) affect the ability to realise disruptive innovations. While studies into public sector innovation have gained traction in recent years (Al-Noaimi et al., 2022) and more recent literature looks at the institutionalisation of public sector innovation (Hjelmar, 2021), the overall literature remains immature and fragmented (De Vries et al., 2016) with a large number of challenges (Cinar et al., 2019).

1.2 | Public sector innovation through Digital Service Delivery

Governments have used Digital Service Delivery (DSD) to innovate the public sector. DSD has helped governments to connect with unprecedented numbers of citizens through greatly improved services at a fraction of the cost (Fishenden & Thompson, 2012; Hui & Hayllar, 2010). It has made public services more accessible and reliable (Castelnovo & Sorrentino, 2018) and enhanced citizen outcomes (Gil-Garcia et al., 2018). DSD has allowed a radical reduction in the cost of delivering government services—one government study found that the average cost of a digital government transaction was over time 20 times cheaper than traditional post, telephone, and face-to-face transactions (UK Cabinet Office, 2012).

Over the last 20 years, there has been a global trend for digitisation of government (United Nations, 2016). This global trend occurred through distinct waves including an initial establishment of E-government, a move to Government 2.0, and the rise of digital government (Katsonis & Botros, 2015). The initial digitisation of government, E-government, saw government adopt Information and Communications Technologies (ICTs) and create an online presence via

rudimentary websites. Government 2.0 built on E-government by moving away from simplistic website publishing to two-way interactions with citizens via portals and online forums. The last stage, digital government, sees government deliver fully online and tailored public services (Katsonis & Botros, 2015). In more recent times during the global COVID-19 pandemic, out of necessity government shifted services online and moved a traditionally face-to-face workforce to working from home (Eriksson et al., 2021). In recent accounts (Gil-Garcia et al., 2018), it is now becoming increasingly difficult to observe any government service that does not involve digital. However, even with the far greater adoption of digital services in government, there still remain structural and cultural challenges to digital government (Wilson & Mergel, 2022).

1.3 | Evolution of public sector innovation through DSD in Australia

Since the 1990s, Australia has transitioned from E-government to Government 2.0 and then digital government. Williams (2012) provides an account of this history—starting in 1997 when the then Australian Prime Minister, John Howard, set a target for all appropriate Australian Commonwealth government agencies to have a website presence. Five years later, in February 2002, the Prime Minister announced that this target had been met. In subsequent years, the government made further improvements by bringing more government services online through a Whole of Government 2.0 taskforce and multiple reviews of its digital capabilities. After many years of effort and investment, by 2016 the Australian government was delivering over 80% of services online and ranked third in world for delivery of digital government (United Nations, 2016). By 2022, Australia ranked seventh in global E-government rankings with 85% of services deemed available online (United Nation, 2022). These changes over the last two decades were a radical improvement from a government that consisted of only two websites in the late 1990s.

In July 2015, as a continued commitment to public sector innovation, the Australian Government released the Digital Service Standard (DSS) to support the adoption of digital government services (Digital Transformation Office, 2016). As this occurred, there was global interest in digital government standards (Katsonis & Botros, 2015) with comparable standards already in place across the United Kingdom and United States, and a new standard released in Canada during 2017 (Department of Finance Canada, 2017; UK National Audit Office, 2017; US Digital Service, 2016). By 2022, since its introduction, the Australian DSS has been applied across the federal and other government jurisdictions (Digital Transformation Office, 2023). This paper explores the effectiveness of the DSS as an innovation management tool for the Australian Government. In particular, this research evaluates the alignment between the DSS and the commonly adopted innovation management approaches of Innovation Process Management (Cooper, 1990) and Innovation Portfolio Management (Tuff & Nadji, 2012). The analysis draws on publicly available data on DSS assessments from July 2015 to March 2021 and case studies of specific assessments. The research considers where the DSS has effectively navigated challenges to public management of government funding, evidencing innovation outcomes and passivity across public institutions (Al-Noaimi et al., 2022).

This evaluation found that the DSS exemplifies Innovation Process Management in its use of stages and gates, and Innovation Portfolio Management in its use of targeted assessment criteria and application across multiple projects. The paper closes by proposing an innovation management framework to realign the DSS to better practices of Innovation Process Management and Innovation Portfolio Management, including tailoring the DSS for new and existing services across a greater proportion of government agencies, and adopting specific standards to encour-

age incremental and disruptive innovations. The analysis also identified design limitations in the DSS as a whole of government innovation management approach due to its limited uptake in the majority of large agencies and lack of specific standards to encourage different types of innovation by traditional private sector taxonomies (Henderson & Clark, 1990) as well as modern public sector typologies (Chen et al., 2020). Finally, there is a reflection on the nuisances in adapting private sector innovation management in the public sector.

This paper is structured into three sections. Section 1 focusses on the literature review and introduces the emerging field of government innovation management, describes two contemporary innovation management approaches, namely, Innovation Process Management (Cooper, 1990) and Innovation Portfolio Management (Tuff & Nadji, 2012), and presents background details on the DSS. Section 2 presents the research method adopted for this study. Section 3 analyses and summarises the delivery of the DSS from 2015 to 2021 and assesses how the DSS enabled innovation across government. Section 3 also summarises the learnings from initial years of the DSS, acknowledges where the DSS had success, and proposes a theoretical framework to improve the DSS. This research tackles a key area of public debate around the digitalisation of government while assessing the appropriateness and effectiveness of innovation management methods in government. The theoretical framework from this research can be applied directly back into the Australian context and, more importantly, to the management of any public sector innovation management portfolio.

2 | LITERATURE REVIEW—INNOVATION MANAGEMENT, APPLICABILITY IN THE PUBLIC SECTOR, AND AUSTRALIA'S INNOVATION MANAGEMENT PROGRAM

Many years have passed since Schumpeter's seminal studies of innovation and creative destruction (Schumpeter, 1942), and innovation is still a central area of debate in management (Dodgson et al., 2014; Lyytinen, 2022). There naturally exists a strong justification for innovation management given its importance in supporting operational improvements (Calantone et al., 2002) and firm performance (Mone et al., 1998). Hargadon (2014) advocates for innovation management by emphasising the need for managers to coordinate resources and broker innovation.

One of the major challenges in innovation management is that there is a fragmented view on the topic (Tidd, 2001). This challenge stems from our fluid understanding of innovation. This understanding has shifted from a 20th century focus on the concepts of innovation as invention (Baunsgaard & Clegg, 2015), new product development (Marceau, 2008), and as a linear process (Godin, 2006). These early views have evolved to recognise innovation as being more than invention (Poole & van de Ven, 2004), occurring through networks and across organisational boundaries (Chesbrough, 2003; West & Bogers, 2014), drawing on innovation systems (Lundvall et al., 1988), and occurring as part of an innovation ecosystem (Adner, 2006).

Our modern understanding of innovation management is aligned to theories of evolutionary economics and dynamic capabilities (Crossan & Apaydin, 2010). Evolutionary economics (Nelson, 2009) dictates that firms need to actively pursue changes over time to remain relevant and competitive. Dynamic capability theory (Teece et al., 1997) stresses the need for organisations to configure their resources to align with environmental needs. Common across these perspectives is the need to orchestrate organisational resources and structures in support of innovation (Peteraf, 1993) and use innovation as a dynamic capability to respond to customer demands and external pressures

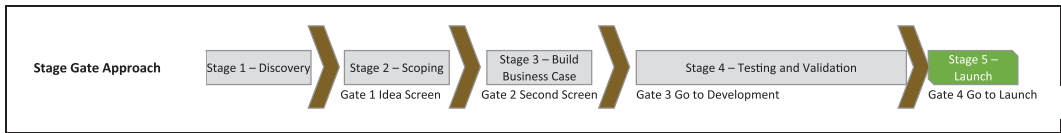


FIGURE 1 Stage-Gate Innovation Process Management stage and gate approach (Cooper, 1990). [Colour figure can be viewed at wileyonlinelibrary.com]

(Slater et al., 2014). As a consequence of this mindset, since the 1990s innovation management has gone hand in hand with a firm's resource allocation (Christensen & Bower, 1996).

Innovation management is not without its challenges. While the highly planned approach to innovation management has led to innovation often originating from senior managers (Elenkov et al., 2005) and using a structured mindset (Asheim & Isaksen, 2002), this top down and rational style has been criticised for underestimating the value of employee-led innovations (Kesting & Parm Ulhøi, 2010) and restricting a level of flexibility inherently required for innovation to succeed (Cooper & Edgett, 2012). A further challenge to innovation management arises out of the tension in balancing innovative pursuits and core business activities. With organisations under pressure to exploit current products and customers (Tushman & O'Reilly, 1996), they often struggle to justify innovative business activities that differ from existing customer requirements and revenue streams (Christensen, 2013).

Discrete approaches have emerged to manage innovation (Adams et al., 2006). A common thread in these approaches is the concept of translating specific inputs into outputs through a targeted process (van de Ven et al., 2008). Specific offshoots of this structured approach have been Innovation Process Management (Cooper, 1990) and Innovation Portfolio Management (Cooper, 1988). With origins back to the NASA space program in the 1960s and 'Phase Project Planning' (Sweeney et al., 1978), these approaches have helped organisations better coordinate innovation across organisations (Chien, 2002) and provide structures to foster new innovations (Seidel, 2007). The below paragraphs introduce each of these methods.

'Innovation Process Management' provides a framework to support development of innovation projects from their early design through to release to customers. One central element of Innovation Process Management is the Stage-Gate approach (Cooper, 1990). Popularised by Robert Cooper in the 1990s, Stage-Gate guides new product development from early ideas to full launch. The original Stage-Gate approach comprises five work stages and four gates. Each stage comprises specific tasks and deliverables. At the end of each stage, there is a gate, where a decision must be made to continue or stop the project. Figure 1 demonstrates a Stage-Gate model.

The Stage-Gate innovation management approach has its drawbacks. One of these is that there may be an overemphasis on upfront requirements and documentation, which slows progress, adds cost, and restricts disruptive innovation (Lenfle & Loch, 2010). In addition, the approach often lacks the flexibility required for fast-paced projects (Cooper, 2014; Tatikonda & Rosenthal, 2000; Verganti, 1999). There have been modern enhancements to Stage-Gate to maintain its relevance through using fewer or shorter stages, and introducing early prototyping and user testing (Cooper, 2014). Although over 20 years old, the Stage-Gate approach remains relevant to this day and is now used in approximately 75% of top-performing companies to manage innovation (Cooper & Edgett, 2012).

'Innovation Portfolio Management' helps firms strategically allocate resource to innovate (Kang & Montoya, 2014), prioritise innovation investments, and balance incremental and transforma-

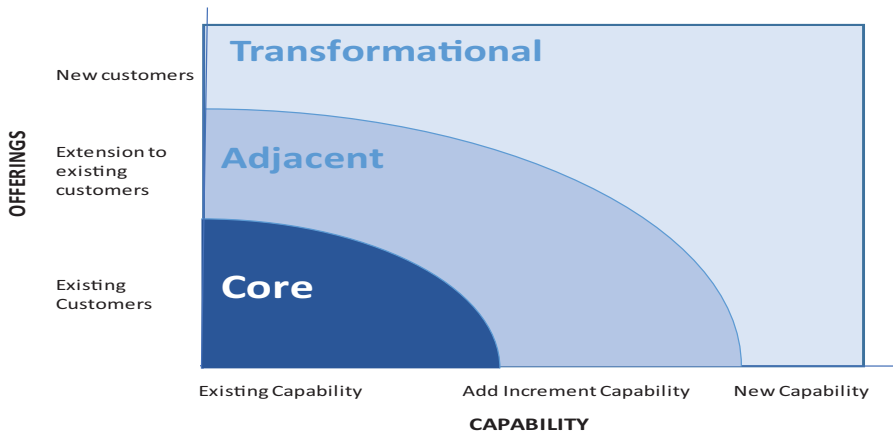


FIGURE 2 Innovation Portfolio Management (Nagji & Tuff 2012). [Colour figure can be viewed at wileyonlinelibrary.com]

tional investments (Tuff & Nadji, 2012). Central to Innovation Portfolio Management is the concept that underinvestment in innovation leads to organisational stagnation with organisations becoming overly reliant on existing offerings, losing competitive advantage, and, ultimately, dying (Drucker, 1985). It also acknowledges that there is greater value in managing innovation projects as a portfolio (Cooper, 1988).

Innovation Portfolio Management is built on the concept of strategic buckets (Chao & Kavadias, 2008). These strategic buckets define the innovation focuses of an organisation and encapsulate strategies and aspirations in both the short and long term. Once these buckets are defined, organisations must find a balance between incremental innovation delivering gradual improvement on existing offerings and disruptive innovation to drive future long-term value (Henderson & Clark, 1990; Salter & Alexy, 2014).

More recent contributors to the field prescribe actual breakdowns of an innovation portfolio. Nagji and Tuff (2012) describe Innovation Portfolios based on offerings and capability. Offerings refers to whether the innovation targets existing customers through to new customers. Capabilities extend existing capabilities, incremental improvements, and new capabilities. Based on these two variables, there is a matrix of innovation ambition that shows three innovations ambitions:

1. Core: existing customers and existing capabilities;
2. Adjacent: expanding into new to organisation pursuits with extensions on customers or incremental capability improvements;
3. Transformation: breaking into new markets that do not exist with new customers and/or new capabilities.

The model is shown in Figure 2 below. Nagji and Tuff (2012) recommend that organisations direct approximately 10% of their innovation investments to transformational innovation because these deliver over two thirds of future organisational revenue.

There are multiple barriers to Innovation Portfolio Management across all industries. One of these is a reluctance to invest in innovation projects due to their risky nature (Ritala & Hurmelinna-Laukkanen, 2013) and high chance of failure (Cozijnsen et al., 2000)—some studies find that the failure rate of innovation projects at over 75% (Evanschitzky et al., 2012). This

makes it very difficult to invest in innovation due to a negative risky perception (van der Panne et al., 2003). Many organisations often struggle to invest sufficiently in disruptive innovations and instead focus on smaller incremental innovations (Klingebiel & Rammer, 2014; Meifort, 2016). Meifort (2016) observed Innovation Portfolio Management failing in many organisations due to low acceptance or an overload in information that hinders effective decision making.

2.1 | Applying private sector innovation management in the public sector

Public Sector Innovation Management has been an emerging and maturing discipline for some time. One origin of the field was the development of New Public Management, which witnessed the widespread adoption of private sector/market-inspired administrative processes in the public sector to drive efficiencies and improvement (Hood, 2005). This innovation mindset was largely premised on the application of existing mindsets in public sector (Gieske et al., 2020). In more recent times, public sector innovation management has grown to acknowledge the field in its own right with unique features such as focus on co-creation and public service delivery (Osborne, 2018). There is recognition that innovation in the public sector targets problems that the market neglects and requires a high level of management coordination in order to be successful (Osborne & Brown, 2013). There has also been continued debate and redefinition of the types of innovation in the public sector. One of the latest accounts (Chen et al., 2020) defines internal innovations across mission, management, and services, and external innovations across policy, partners, and citizens.

Incompatibilities exist in applying private sector practices in the public sector. Nählinder and Eriksson (2019) identify that there are two fundamental shifts from a private goods-producing sector to a private service-producing sector and a public service-producing sector. These require a different approach to conceptualise and manage innovation. A notable challenge is when public managers try to treat a citizen like a customer, which is not a simply swap (Aberbach & Christensen, 2005). Finally, others celebrate and acknowledge the opportunities for the public sector to lead in certain innovation pursuits due to its value for society and the sector's ability to lead in certain fields (Bason, 2010; Mazzucato, 2011). In further paper, authors reinforce government's leadership role in sparking innovation (Mazzucato, 2015) and shaping markets through public value creation (Mazzucato & Ryan-Collins, 2022).

The public sector's application of innovation management processes is immature and is often a barrier to public sector innovation (Cinar et al., 2019). In relation to the previously mentioned innovation management approaches of Innovation Process Management and Innovation Portfolio Management, Stage-Gate Innovation Process Management has largely been adopted by the private sector (Kahn et al., 2006) for new product development (Aas et al., 2017). There have been limited application of the approach across Government and the public service (Cooper et al., 2002; Lappi et al., 2019). Hartley and Knell (2022) found that enforcing stage gates and, in particular, stopping public sector projects is difficult due to organisational and cultural stigma relating to failure. Further analysis of Innovation Process Management in the public sector needs to recognise the inherent challenges that come with shaping projects, justifying investment and successful delivery of projects in government (Flynn, 2007).

Within the public sector context, Innovation Portfolio Management has received little attention (Globocnik et al., 2022). More holistically, governments have found it hard to prioritise innovation (Meifort, 2016; Rittel & Webber, 1973). Contemporary governments are always pressured to deliver immediate benefits (Farrell & Saloner, 1985) under fiscal constraint while doing more with less

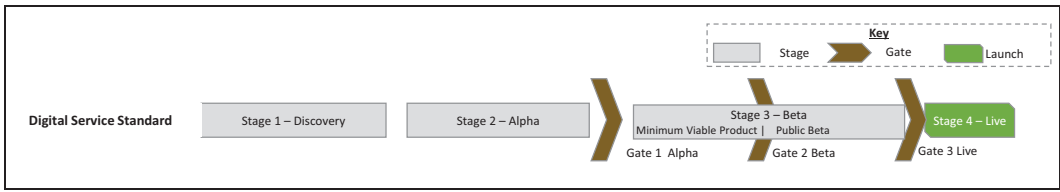


FIGURE 3 Digital Service Standard stages and gates. [Colour figure can be viewed at wileyonlinelibrary.com]

(Osborne, 1993) and with close scrutiny from the voting public (Bloch, 2010). While more sophisticated and well-funded governments have been fortunate to be able to explore targeted programs to foster innovation portfolios, the overall Innovation Portfolio Management maturity in government is low (Roberts & Schmid, 2022). A fundamental challenge to the public sector is that the overall field of portfolio management, not just for innovation, is still in its infancy (Roberts & Edwards, 2023).

2.2 | Australia’s innovation management program—The DSS

In July 2015, the Australian Federal Government released the DSS. The DSS aims to deliver government ‘services that are simple, clear, and fast’¹ and applies to new and redesigned government services (Digital Transformation Office, 2016). The DSS is core to embracing innovation in government and ‘making government digital by default’ (Department of Prime Minister and Cabinet, 2015, p. 14). It also complements the Australian Government ‘2030 Prosperity through Innovation Report’ which seeks to make government a catalyst for innovation and be recognised as a global leader in innovative service delivery (Department of Industry Science and Resources, 2017).

The DSS is a management framework for government projects during (a) assessment stages of a project according to (b) standard criteria.

2.2.1 | Assessment stages

The DSS is administered through four sequential stages (see Figure 3). To begin the process, Discovery (Stage 1) is performed to understand the service landscape, technology considerations, and user needs. Alpha (Stage 2) involves user research, building prototypes, and iterating the solution. Beta (Stage 3) advances stage 2 prototyping and builds an accessible and secure service, which members of the public can trial. Finally, Live (Stage 4) sees the service rolled out to all intended users.

2.2.2 | Standard criteria

The core feature of the DSS is 13 standards (see Table 1). The criteria are used to judge projects.

It is worth noting that many of these standards align to key themes in the innovation literature. Thus, include:

TABLE 1 Digital Service Standards.

1. Understand user needs
2. Have a multidisciplinary team
3. Agile and user-centred process
4. Understand tools and systems
5. Make it secure
6. Consistent and responsive design
7. Use open standards and common platforms
8. Make source code open
9. Make it accessible
10. Test the service
11. Measure performance
12. Don't forget the non-digital experience
13. Encourage everyone to use the digital service

1. Standard 1 (understand user needs) promotes innovation based on an appreciation for the end recipient of a service (Rowe, 1991).
2. Standard 2 (encouraging multidisciplinary teams) supports collaborative partnerships with other government agencies and non-government entities such as universities and industry (Wilson & Doz, 2011).
3. Standard 7 (use open standards), standard 8 (make source code open), and standard 9 (make it accessible) aid open innovation through the flow of ideas in and out of government (Chesbrough, 2003).
4. Standard 3 (agile and user-centred process) promotes rapid piloting of ideas and iterations of new offerings, which help break organisational inertia (Chiaroni et al., 2011) and promote organisational learning (McKee, 1992; Wilson & Doz, 2011).
5. Standard 10 (test the service) and standard 11 (measure performance) align to the theme for trialling and measuring performance of new innovation (Sosna et al., 2010).

During various stages of its life, a project is assessed against these standards. At the Alpha stage, the service must pass standards 1–3. At the Beta and Live stages, the service must pass all 13 standards. The outcomes of DSS assessments are available via a government website.

The DSS displays elements of both Innovation Process Management and Innovation Portfolio Management. The DSS utilises stage gate assessments, which is a common attribute of Innovation Process Management (Cooper, 1990). The DSS shares commonality with Innovation Portfolio Management in that it has a clear set of assessment criteria that encourage specific project types and delivery behaviours (Chao & Kavadias, 2008).

The above provides an overview of the importance of public sector innovation and digital services in government and increasing efforts to manage public sector innovation. With the introduction of the DSS, it is important to understand its effectiveness in fostering innovation. The next section describes an approach for evaluating the DSS as an Innovation Process Management and Innovation Portfolio Management tool.

3 | RESEARCH METHOD

This section describes the approach to assess the effectiveness of DSS as an innovation management tool. The analysis uses explorative research methods (Stebbins, 2001), drawing on close analysis of publicly available information on the government program. In looking at the program's history, we explore statistical trends in the program's assessment over time and also specific case study assessments. Using these different assessment methods, we can compare the real-life experience of the program against the literature to draw conclusions (Yin, 2004). This balance between quantitative and qualitative assessment has been recently found to be particularly important in public administration research (Hendren et al., 2022).

Building on the known challenges to government innovation management discussed in the literature review and positioning of the DSS as an Innovation Process and Portfolio Management instrument (Cooper, 1990; Tuff & Nadji, 2012), we created a research method that followed the blow steps:

1. Data source identification on the innovation program;
2. Data codifying on projects assessed by the program;
3. Descriptive analysis on the impact of the program;
4. Case studies on innovation projects and the program's impact;
5. Convergency analysis and theoretical framework to guide the research and bring together the findings.

3.1 | Data sources

This assessment was informed by the DSS website and assessments completed from July 2015 to June 2021.

3.2 | Data codification

To understand the program, we created a framework to codify and analyse (Wasserman & Faust, 1994) DSS assessments over the years. This included:

1. Project Name and Owning Agency;
2. Organisation Completing the Assessment;
3. Date Complete;
4. Type of Innovation: internal innovations across mission, management, and service, and external innovations across policy, partner, and citizen (Chen et al., 2020);
5. Overall Result: Pass, Not-Pass (including fail and not tested);
6. Assessment Stage: Alpha, Beta, Live;

7. Results Against 13 Digital Services Standards: Pass, Not-Pass.

3.3 | Descriptive analysis

The collation of this information allowed us to explore volumes of DSS assessments over time, results of assessment, performance of projects against DSSs, and type of innovation.

3.4 | Case studies

A subsequent deep dive on case studies was used to validate observations in the data (Creswell, 2013). This case analysis was informed by government websites, department annual reports, and other relevant documents such as Australian National Audit Office Reports. This use of publicly available data is a widely accepted approach for public sector research (Veljković et al., 2014).

3.5 | Convergency analysis and theoretical framework—Alignment between theory and practice

In evaluating the impact of the DSS on public sector innovation, we used a comparative case study approach to connect policy and practice (Bartlett & Vavrus, 2016). This compared against the DSS using a theoretical framework against key features in the innovation management approaches of Innovation Process Management and Innovation Portfolio Management, common challenges to public sector innovation management (Al-Noaimi et al., 2022), and differences between public/private sector innovation management. The public sector innovation process and portfolio management theoretical framework underpinning the research is outlined in Table 2 below.

This testing of the DSS experience allowed us to confirm the relevance and impact of Innovation Process Management and Innovation Portfolio Management approaches (Sekaran & Bougie, 2016) and to surface opportunities for improving the delivery of digital government innovation in Australia (Bryman & Bell, 2015).

4 | RESEARCH FINDINGS

4.1 | Descriptive analysis of the DSS

This section shows the (a) volumes of DSS assessments across government over time, (b) results of the overall assessment, (c) performance against DSSs (see Table 1 for the 13 DSSs), and (d) types of innovation supported.

4.1.1 | Volume of Assessments

Since its inception in July 2015, the DSS has been applied to Australian Commonwealth, State, and Territory Government Agencies during 45 publicly published assessments². Each assessment used the 13 standards (Table 1) and resulted in an overall result of pass or fail. As shown in Figure 4,

TABLE 2 Public sector innovation process and portfolio innovation management theoretical framework.

Features of Innovation Process Management	Features of Innovation Portfolio Management
<ul style="list-style-type: none"> • Clear stages and gates (Cooper, 1990) • Flexibility based on project type (Cooper, 2014) • Enforcement of gates to stop projects (Cooper, 2008) • There is an appropriate expectation of projects to provide documentation that is not too much of a burden (Lenfle & Loch, 2010) 	<ul style="list-style-type: none"> • Encourages a diverse range of incremental and transformational innovations (Nagi & Tuff, 2012) • Risky innovations are presented for assessment (Klingebiel & Rammer, 2014) • Innovation portfolio management is adaptable for fast paced environments (Nauyalis & Carlson, 2010)
Key public sector innovation management challenges to overcome:	Differences in public and private sector innovation management
<ul style="list-style-type: none"> • Common drivers/inhibitors to public sector innovation (Sahni et al., 2013): <ul style="list-style-type: none"> ○ Optionality to experiment ○ Need to respond to low performance ○ Formalisation of feedback loops ○ Incentives to innovate ○ Budget constraints • Key challenges to overcome (Al-Noaimi et al., 2022): <ul style="list-style-type: none"> ○ Public management of government stimulus ○ Visualising innovation outcome ○ Knowledge management ○ Passivity across public institutions 	<ul style="list-style-type: none"> • Different innovation types (Chen et al., 2020): <ul style="list-style-type: none"> ○ Internal innovations across mission, management, and service ○ External innovations across policy, partner and citizen • Public sector focuses on co-creation and public value in a service context (Osborne, 2018) • Public sector context require / suit public sector innovation leadership (Bason, 2010; Mazzucato, 2011)

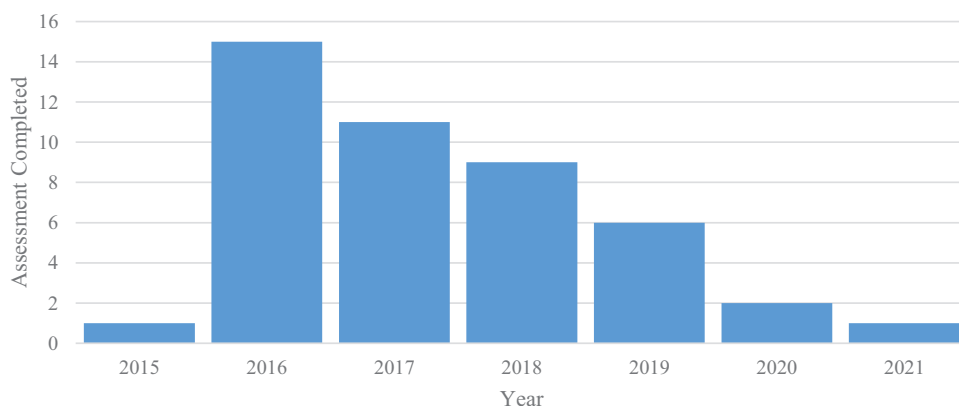


FIGURE 4 Digital Service Standard—Assessments published.

Source: DTA (Australia Government, 2023).

[Colour figure can be viewed at wileyonlinelibrary.com]

the trends in assessments saw the Digital Transformation Agency (DTA) facilitate and publish a peak of 15 in its second year and declining year on year volume with one completed in 2021.

The assessments were distributed across 12 Australian government organisations. This included the agency administering the program (the Digital Transformation Agency), 10 Commonwealth Government Entities, and a Territory Government Agency. Most of these assessments were Alpha assessments (51%) and the remaining were Beta assessments (36%) and Live assessments (13%). Details on the assessed organisations and assessment type are included in Table 3.

4.1.2 | Assessment results

As per the below Table 4, of the 45 overall assessments, 45 (98%) received a pass score. All 23 Alpha assessments, which were performed against DSS standards 1–3, passed the overall assessment. There were 16 Beta assessments, which were performed against all 13 standards, with 15 passes and one failure. All six Live assessments, which were performed against all 13 standards, passed.

It is recognised that this success rate is notably higher than what has been seen in other innovation programs, where the majority of innovations fail (Evanschitzky et al., 2012). The rationale for this high success rate is assessed further in the discussion.

4.1.3 | Performance against DSSs

The below section captures the result of projects against the 13 digital services standards. Projects at the Alpha phase are assessed against only three standards. Projects at Beta and Live stages are assessed against all 13 standards.

Alpha project results

Across Alpha projects, all projects passed relevant criteria for that stage (see Figure 5 below).

TABLE 3 Organisational reviews using Digital Service Standard.

Organisation	Organisation type	Assessment type			
		Alpha	Beta	Live	Total
Department of Health	Federal Government Entity	6	5	1	12
Digital Transformation Agency	Administering Agency	5	3	1	9
Department of Human Services	Federal Government Entity	4	2	1	7
IP Australia	Federal Government Entity		1	2	3
Department of Immigration and Border Protection	Federal Government Entity	2	1		3
Department of Industry, Innovation and Science	Federal Government Entity	1	2		3
Australian Taxation Office	Federal Government Entity		1	1	2
Australian Bureau of Statistics	Federal Government Entity	1	1		2
Department of Veteran's Affairs	Federal Government Entity	1			1
Department of Education	Federal Government Entity	1			1
ACT Health	Territory Government	1			1
National Blood Authority	Federal Government Entity	1			1
Grand total		23	16	6	45

Source: DTA (Australia Government, 2023).

TABLE 4 Overall results.

Organisation type	Assessment type			Total
	Alpha	Beta	Live	
Pass	23	15	6	45
Not pass	0	1	0	1
Total	23	16	6	46

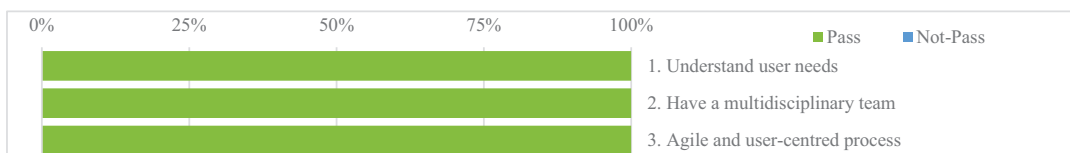


FIGURE 5 Alpha assessment results against standards. [Colour figure can be viewed at wileyonlinelibrary.com]

Beta project results

Across Beta projects (see Figure 6), there were examples of various standards not being met across the sample. The standards that saw the greatest number of challenges related to accessibility (standard 9) and making the source code open for all (standard 8).

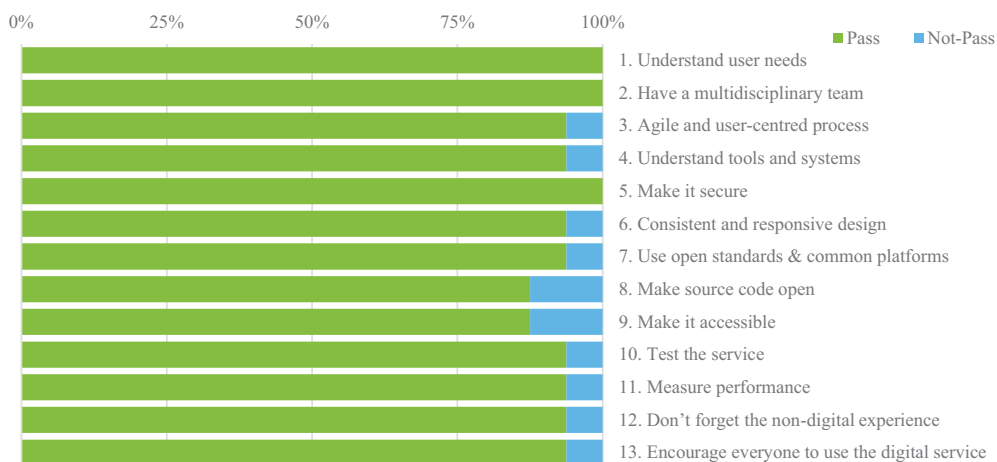


FIGURE 6 Beta assessment results against standards. [Colour figure can be viewed at [wileyonlinelibrary.com](https://onlinelibrary.wiley.com/doi/10.1111/1467-5300.12615)]

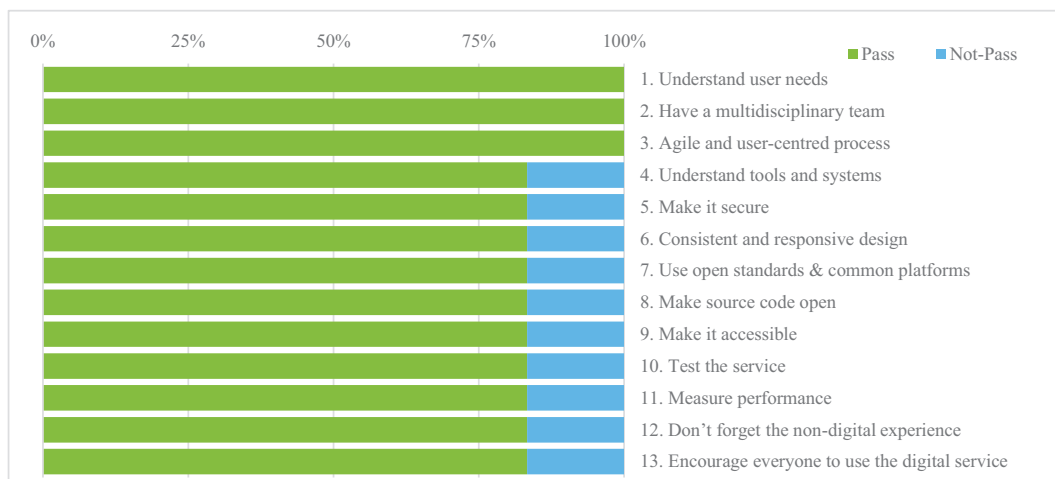


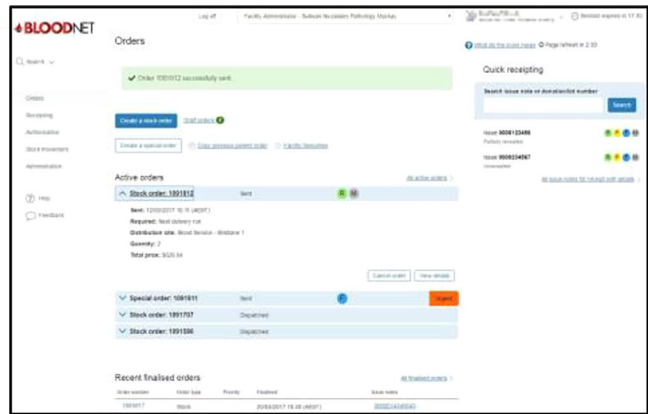
FIGURE 7 Live assessment results against standards. [Colour figure can be viewed at [wileyonlinelibrary.com](https://onlinelibrary.wiley.com/doi/10.1111/1467-5300.12615)]

Live project results

Across Live projects (see Figure 7), there were instances of projects passing the gate without successfully meeting all standards. Noteworthy standards not met including security (5), responsive design (6), common platforms (7), testing (1), and performance measurements (11).

In addition to scores against each standard, the assessments highlighted areas of noteworthy performance and improvement recommendations. The top areas of good performance included understand tools and systems (standard 4); consistent and responsive design (standard 6); make it accessible (standard 9); and don't forget the non-digital experience (Standard 12). The top areas of recommendations included understand tools and systems (standard 4); have a multidisciplinary team (standard 2); consistent and responsive design (standard 6); and encourage everyone to use the digital service (standard 13).

FIGURE 8 BloodNet screenshot.
[Colour figure can be viewed at
wileyonlinelibrary.com]



To complement these observations, a case analysis was performed on three assessments, including BloodNet (Alpha); Digital Marketplace (Beta); and MyGov (Alpha).

4.1.4 | Types of innovation supported

Since its inception in July 2015, the DSS has been applied to 45 assessments with the following breakdown by innovation type (Chen et al., 2020):

- External citizen: 29 (64%);
- Internal service: 10 (22%);
- External partner: 5 (11%);
- Internal management: 1 (2%);
- Internal mission: 0;
- External policy: 0.

This emphasis on citizen and service innovations shows a unique alignment to the nature of public service (Nählinder & Eriksson, 2019), which justifies the use of these management approaches. This utility is discussed later.

4.2 | Case analysis of the DSS

The below three case studies further explore the assessments completed. They look at the context of the innovation projects, the nature of government service, background to the assessment, and impact of the assessment. This section highlights some of the key organisational drivers for the review and nature of how the reviews were completed.

4.2.1 | Case 1: BloodNet—Redesigning digital blood ordering

BloodNet is an existing government service supporting healthcare staff to order blood products online from the Australian Red Cross Blood Service (see Figure 8). BloodNet was released in 2011

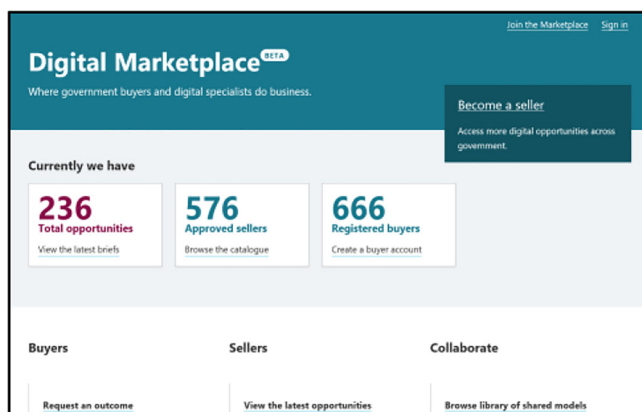


FIGURE 9 Digital Marketplace screenshot. [Colour figure can be viewed at wileyonlinelibrary.com]

and is used by nearly all hospitals and laboratories to process over 500 blood orders a day (National Blood Authority, 2016).

In 2017, BloodNet underwent an Alpha Assessment. This review looked at the project's alignment to the first three DSSs: (1) Understand user needs; (2) Have a multidisciplinary team; and (3) Agile and user-centred process. BloodNet passed all three standards.

The assessment included a heavy emphasis on engaging a diverse set of existing users through 39 site visits and 100 individual interviews³. This level of consultation demonstrates a user-driven innovation approach (Franke, 2014). It was also positive to see the use of prototypes, as this helped present real solutions to existing problems. What was evident in this assessment is that it set out to improve stable BloodNet services that had been in place for many years (National Blood Authority, 2016). The assessment targeted improvements in response to known user issues (Dewar & Dutton, 1986) through encouraging incremental innovation, which is a typical approach for innovation management in patient critical health services (Fleuren et al., 2004).

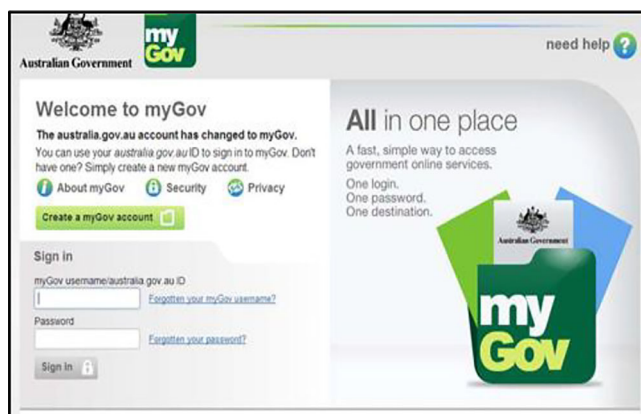
4.2.2 | Case 2: Digital Marketplace—An online market for digital services

The Digital Marketplace is a new website allowing government departments to buy technology-related services through an interactive job posting board (see Figure 9). The marketplace supports buying from an agreed set of technology and digital service buyers listed on the website. During August 2017, there were over 600 registered government buyers and over 500 suppliers on the marketplace.

In August 2016, the project first underwent an Alpha Assessment against standards 1–3, which it passed. By the end of the Alpha assessment⁴, the project was reported to have created a multidisciplinary team, explored the public service procurement landscape, and already begun testing concepts with users. In March 2017, the project underwent a Beta assessment against all 13 standards. By the completion of the Beta assessment⁵, the project had performed iterative design and development, and involved close working with potential external users. These attributes during the Alpha and Beta assessments encouraged end-user-driven innovation (West & Bogers, 2014), understanding user needs (Standard 1), supporting multidisciplinary teams (Standard 2), and agile and user-centred processes (Standard 3).

An important element of this case is the final result—at the completion of the Beta assessment, the Digital Marketplace failed the overall assessment. This was because the project did not pass

FIGURE 10 MyGov screenshot.
[Colour figure can be viewed at
wileyonlinelibrary.com]



the Accessibility standard (standard 9) as it was not fully accessible for high-need individuals with disabilities. The DSS assessment report recommended that the project perform a formal assessment against common government accessibility standards and provide a plan for remediation actions.

Notably, in the months after the failed assessment, the Digital Marketplace continued to operate. By the time of this review, there had been over 200 transactions registered online, with over a dozen registered in August 2017—5 months after the failed assessment⁶. The continuation of the project following a failed gate result suggests that the gate decision was not a binding decision for this project. This tendency for gates to be circumnavigated has often been referred to as ‘gates with no teeth’ and is a common challenge to innovation management processes (Cooper, 2014).

4.2.3 | Case 3: MyGov—A look back at the government’s single online portal

MyGov is an existing single portal for Australians to access government services. Launched in May 2013, it provides individuals with secure online access to services across health care, tax, welfare, child support, and veterans’ affairs (see Figure 10). By November 2016, MyGov supported nearly 11 million active accounts and over 160,000 daily logins (Australian National Audit Office, 2017). In January 2017, the DTA performed an Alpha assessment of MyGov. The assessment scored MyGov a pass for standards 1–3 and a pass for the overall assessment. This assessment found good user understanding in the project with a wide range of stakeholders involved. The assessment also commended the project against standard 2 (have a multidisciplinary team) for bringing together a diverse team spanning the DTA, Department of Human Services, and Australian Tax Office.

The MyGov assessment demonstrated the evolving role of the DSS to one targeting large existing government services. The MyGov assessment report calls out this new focus in its aim to ‘review the entire MyGov experience and reimagine a user experience that puts users’ needs at the forefront’⁷. Unlike previous assessments targeting new services, that is the Digital Marketplace, or services with small total user numbers, that is BloodNet, MyGov involved millions of users and over 100,000 transactions per day. This assessment pivoted the focus of the DSS to much larger and more complex government services. The Australian Government acknowledged this change during the audit of MyGov, which sighted this assessment as the first of an existing high-volume Australian digital government service (Australian National Audit Office, 2017).

4.3 | Summary convergence analysis

The descriptive analysis of the 45 assessments of the DSS and three sample case studies analysed make clear the Australian Government's intent to encourage innovation through digital government services. The program was able to support innovations in digital services, aiming to enhance citizen interactions, services delivery, and partner coordination (Chen et al., 2020). The adoption across 12 different organisations with wide-ranging policy responsibilities, from health and welfare provision to home affairs, suggests a broad-ranging applicability of the program. To further understand the efficacy and effectiveness of these efforts, the next section explores how the administration of the DSS aligned to the best practices of Innovation Process Management and Innovation Portfolio Management processes.

4.4 | Alignment of DSS to innovation process and portfolio management

This research surfaced alignment between the DSS and Innovation Process Management and Innovation Portfolio Management processes. Using the comparative case study approach (Bartlett & Vavrus, 2016), the innovation management approaches of Innovation Process Management and Innovation Portfolio Management were synthesised into a theoretical framework and compared for similarities and differences to the real-life experience of the DSS. These are summarised in Table 5 below capturing similarities and differences.

5 | DISCUSSION: A THEORETICAL FRAMEWORK FOR IMPROVING THE DSS

An opportunity exists to improve the design and execution of the DSS to support of public sector innovation in line with contemporary Innovation Process Management (Cooper, 2008; Holzweissig & Rundquist, 2017) and Innovation Portfolio Management (Aas et al., 2017; Tuff & Nadji, 2012).

To build on the earlier Public Sector Innovation Process and Portfolio Management theoretical framework (see Figure 2), specific improvements have been proposed to apply Innovation Process Management and Innovation Portfolio Management in the public sector and apply them more practically and continuously across public sector projects (Wilson & Doz, 2011). This framework includes key four opportunities for improvement and areas to reinforce based on the DSS experience. This is captured in the below (Table 6) theoretical framework.

Further details on the four improvement areas are outlined over the coming pages.

5.1 | Improvement 1: Project profiling

The first improvement opportunity would see the standards tailored for new and existing services and disruptive and incremental innovation. This recognises that new projects need to be treated differently from existing services and incremental innovations differently from disruptive innovations (Kelley, 2009). Specifically, disruptive innovation may be encouraged to undertake

TABLE 5 Comparison between Digital Service Standard (DSS) and innovation management approaches—Innovation Process Management and Innovation Portfolio Management.

Approach	Innovation Process Management	Innovation Portfolio Management
Similarities	<ul style="list-style-type: none"> • The DSS sets out a set of structured stages and gates that encourage repeatable identification, assessment, and progression of innovations (Cooper, 1990). • The DSS provides structured feedback during key stages of a project and offers guidance on project improvement (Cooper, 2008). Across the projects reviewed, there was an average of over three recommendations for improvements in each assessment. For example, the BloodNet Beta assessment included improvement recommendations to make the service more secure, design a consistent user experience, improve accessibility, and employ thorough service testing. 	<ul style="list-style-type: none"> • The use of the standard across 12 organisations over multiple years for over 40 assessments evidences its utility as a government-wide innovation portfolio management tool (Cooper, 1988). It is commendable that program extended complex portfolios of immigration, human services, health, tax, and education, amongst others. This coverage also extended to a Territory Government in the Australian Capital Territory Government (ACT). • The diverse assessment criteria encouraged different types of innovations across citizen interactions, services delivery, and partner coordination. The DSS also fostered open innovation (Chesbrough, 2003) across the Australian Government through supporting the use of open standards (standard 7) and having multidisciplinary teams (standard 2).
Differences	<ul style="list-style-type: none"> • The original Innovation Process Management approach prescribes greater upfront scoping and the development of a business case, as well as multiple gates before system development occurs (Cooper, 1990). In contrast, the DSS allows two stages of system delivery work (Discovery and Alpha) without any gates. This means that by the time a DSS project is assessed against the first gate, it has already undergone development work and prototyping. In favour of the DSS, the use of early development and testing allows early and iterative end user experience, which increases the chances of adoption (Cooper, 2014). • The DSS has to date applied a level of flexibility on gate decisions. As shown in the Beta and Live Assessment, projects were permitted to pass a gate even when multiple criteria had not been met. This limited enforcement of gates is a common challenge to Innovation Process Management and makes it difficult to differentiate between good and bad projects (Cooper, 2008). 	<ul style="list-style-type: none"> • There were no specific standards to support incremental innovation versus encouraging major disruptive innovation (Henderson & Clark, 1990). This was evident in the analysis when common criteria were applied for single agency-based services, such as BloodNet, through to large cross-government services, such as MyGov. The current 13 standards make no distinction based on size, risk, or level of innovation (Slater et al., 2014). • While the standard was adopted by 12 organisations, there was an overall low uptake across the Australian Federal Government. In fact, 15 of the large Australian Federal Government agencies with over 1500 staff (Department of Finance, 2017) did not undergo an assessment. This limited uptake restricts the government's ability to shape a cross-government innovation portfolio. One consideration in this space is whether agencies were avoiding the standard due to the likely time and cost required to prepare for a review and respond to any feedback (Carter & Weerakkody, 2008).

TABLE 6 Theoretical framework for Innovation Process and Portfolio Management.

Key considerations when adopting Private Sector innovation management in the Public Sector

- Innovation approaches need to target unique government services, combat administrative and interaction barriers, and avoid institutional resistance to innovation in government (Cinar et al., 2019).
- Transparency in the public sector drives a structured approach but introduced potential short termism or presentation bias (Torffing et al., 2019).
- There is an increasing convergence of DSD, government operations, and innovation (Criado & Gil-Garcia, 2019).
- Public sector digital innovation management needs to be collaborative in nature (Gil-Garcia et al., 2018).

Improved Public Sector Innovation Portfolio Management

- Improvement 1: Project profiling to encourage a diverse innovation portfolio (Nagji & Tuff, 2012)—flexibility base on project type.
- Development of a new approach to clarify public sector innovations.

Reinforce

- Provides assessment criteria that encourages a diverse range of innovation types (Nagji & Tuff, 2012)
- There is some flexibility to support more disruptive innovations assessment (Klingeibel & Rammer, 2014)

Public Sector Innovation Process Management

- Improvement 2: Adjusting approach based on project profiles (Cooper, 2014)
- Improvement 3: Enforcing Gates with Teeth (Cooper, 2008)
- Improvement 4: Global adoption and open innovation (Mu & Wang, 2022).

Reinforce

- Structured stages and gates applied to agreed projects (Cooper, 1990)
- Transparent expectation of projects to provide documentation that is not too much of a burden (Lenfle & Loch, 2010)

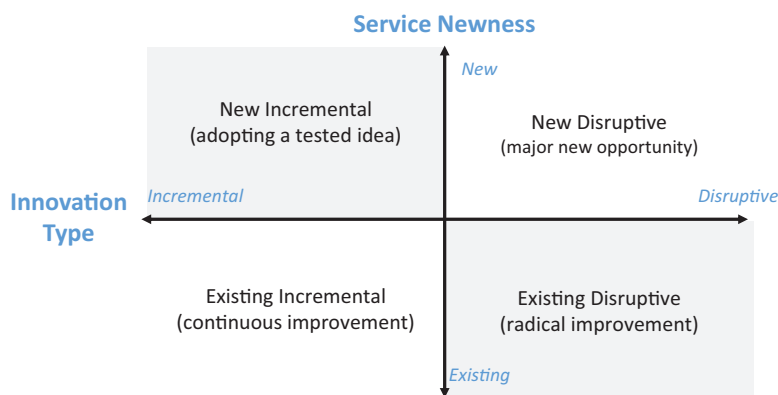


FIGURE 11 Framework for classifying public service innovations. [Colour figure can be viewed at wileyonlinelibrary.com]

experimentation, establish proofs of concept, and accept far higher tolerances for failures (Christensen, 2013). For these disruptive innovations, there are specific opportunities in the public sector to explore business model innovation, such as partnership with the private sector (Lee et al., 2012). Incremental innovation may be subjected to targeted assessment standards that encourage continuous customer improvement (Menguc et al., 2014) and building feedback loops (Hughes & Chafin, 1996).

Through focusing on newness and degree of innovation (Dodgson et al., 2014), it is possible to construct a two-dimensional framework (see Figure 11) to guide a revised DSS.

As shown in Figure 11, this considers the needs of new and existing services, and incremental and disruptive innovations as four segments that are broadly described as follows:

1. **New Service Incremental Innovations:** These are opportunities for a new service that are delivered through the adoption of a tested idea to address a known problem. Standards should focus on efforts to understand the problem and identify practical solutions to fill identified needs.
2. **New Service Disruptive Innovation:** This occurs when there is a major opportunity for a new service that would create new areas of value for government. The standards should encourage open exploration of new services and finding radical ways to address societal problems based on new, often radical, ways of working (Govindarajan et al., 2011).
3. **Existing Service Incremental Innovations:** These services are in place and would benefit from a gradual and ongoing service enhancements. The standards should encourage government to look at its existing services and identify ongoing improvements to core services. In this area, the standards should recognise the significant opportunities for leveraging frontline worker insight to drive innovation (Kesting & Parm Ulhøi, 2010).
4. **Existing Service Disruptive Innovation:** This innovation involves services in place that would benefit from major performance or cost improvements (Salter & Alexy, 2014). These standards should seek service redesign through disruptive innovations where government encourages new ways of thinking (Chesbrough, 2010) and support staff to actively pursue outside thinking as a means to drive new value creation (Wiklhamn & Styhre, 2017).

At the core of the framework is the recognition that there are different types of innovation and contexts for innovation (Henderson & Clark, 1990), which need to be recognised and managed

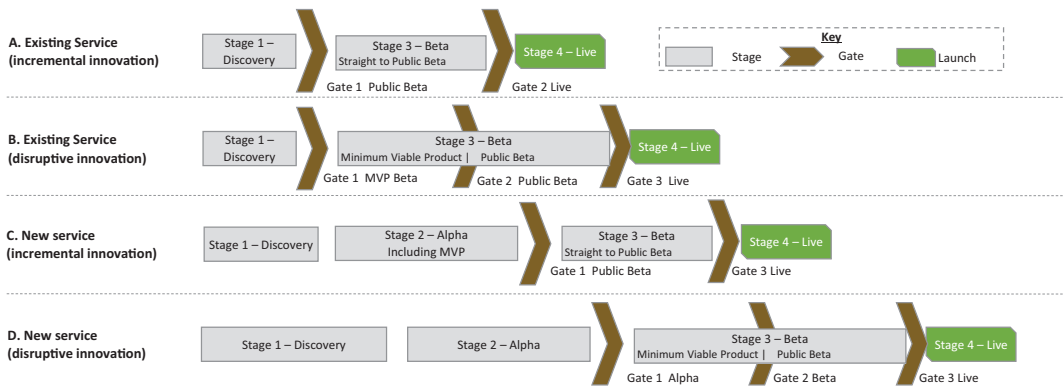


FIGURE 12 Tailored assessment processes. [Colour figure can be viewed at [wileyonlinelibrary.com](https://onlinelibrary.wiley.com/doi/10.1111/1467-5300.12615)]

accordingly. The above two-dimensional framework supports a balance between agile and quick development with rigour and diligence (Cooper, 2014).

5.2 | Improvement 2: Adjusting approach based on project profiles

A further improvement opportunity sees a varied application of stages and gates (Cooper, 2014) based on the dimensions of service newness and degree of innovation (see Figure 12).

As shown in Figure 12, different configurations of stages and gates could include:

1. Existing Incremental Service Innovations: To support continuous improvement, the execution of the standard may see a reduced discovery time and move straight to public Beta. There would be limited need for Alpha as the service is already in existence. This approach would allow quick passage to testing, reduced administrative burden, and faster release of the revised service.
2. Existing Disruptive Innovation: In support of radical service improvements, a process may entail a reduced discovery time followed by a gate to check suitability before moving into a Beta phase. This would include a minimum viable product (MVP) in order to reduce technical risks of the disruption. Beyond the MVP, the service would go for public Beta before a gate prior to going live.
3. New Incremental Innovations: To encourage continuous improvement, the project would go through both discovery and Alpha. Given the incremental nature of the innovation, the MVP may be incorporated into the Alpha stage to allow faster service testing in varied contexts. At the completion of the MVP, the service would go for public Beta before a gated go-live assessment.
4. New Disruptive Innovation: To support major new service opportunities, this aligns to the standard in its current form. This would involve a discovery and alpha stage to explore and design the service. It would then to go to MVP, Public Beta, and Live.

These first two improvements enable dynamic assessments (Cooper, 2014) that could have helped deliver quicker improvements in existing services and focused risk management for

new disruptive services. This flexibility allows for quicker reviews of existing services and more considered assessments for disruptive innovations (Slater et al., 2014).

5.3 | Improvement 3: Enforcing gates with teeth

One of the most notable features of the DSS assessments to date was the high success rate at over 95%. While this may act as a complement to the ability of submissions to meet the service standards, the result does go contrary to the broader literature that the majority of innovation projects are unsuccessful (Evanschitzky et al., 2012). While there was no evidence that any of these projects were unsuccessful, it should be noted that 7% of projects were able to pass an assessment when they did not meet all of the standards. This tendency for gates to be circumnavigated is a common occurrence termed 'gates with no teeth' (Cooper, 2014). In forward iterations of the standard, it could be valuable to consider situations where projects are stopped or discontinued following an assessment.

5.4 | Improvement 4: Global adoption

A further improvement opportunity would focus on a broader application of the DSS across government agencies. During the period of this review, there were less than 50 published assessments, with the highest number reported in a single year being 15 in 2018 (Australia Government, 2023). While we must acknowledge the dip in adoption from 2020 coincided with the COVID-19 pandemic and that this review is based on the publicly available assessments, many government departments (e.g. defence and planning/environment) and services have not adopted the standard. The presence of online results over multiple years gives citizens the opportunity to gain an insight into digital government innovations. However, the selective focus on only a relatively small number of services across government likely encourages presentative bias in the underreporting of activities, overreporting of successes, and overall short-termism approach (Torfing et al., 2019). This is important to recognise as a likely factor that permitted such a high success rate (95%) in projects submitted to this program.

As an additional opportunity for improvement, there could also be expansion of the standard to other Australia States and Territories. This would drive cross-boarder collaboration and service improvements. While this more open sharing of government data and cross-boarder innovation is inherently difficult due to factors such as information security and barriers to cross-government collaboration (Al-Noaimi et al., 2022, Ruijter et al., 2020), government would be able to unlock significant value for itself and the public if it could better work together (Mu & Wang, 2022).

Collectively, these four improvements would see better application of modern innovation management practices. A visual presentation of these four improvements to the DSS is depicted below Figure 13.

These improvement opportunities represent a way forward based on lessons learnt since including assessment results and recent trends in assessments. These changes would see a timely refresh to the standard that is no longer seeing new assessments published on the website. It would also help government continue to drive the adoption of new innovations that help us move beyond COVID-19 (Eom & Lee, 2022). Another opportunity is a more transparent approach to reporting, budgeting, and incentivising innovations and visualising the outcomes of innovation programs (Al-Noaimi et al., 2022). Given the sheer size of government budgets, any progress it makes in

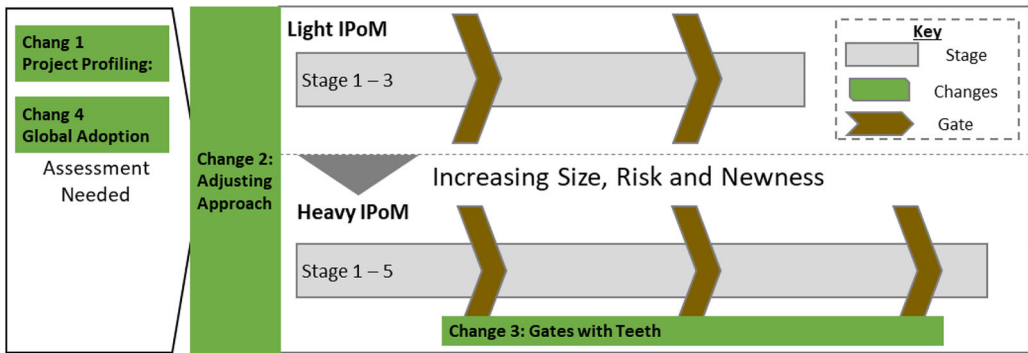


FIGURE 13 Combined application of Innovation Portfolio Management and Innovation Process Management processes with Digital Service Standard for public service innovation. [Colour figure can be viewed at wileyonlinelibrary.com]

delivering innovation would allow it to diffuse these innovations to the private sector, as opposed to the other way around (Chen et al., 2020).

6 | CONCLUSION: IMPACT, LIMITATIONS AND FUTURE RESEARCH

This study builds on the innovation management and public sector literature. Importantly, it extends the area of innovation management using the discrete tools of Innovation Process Management and Innovation Portfolio Management into the public sector. In performing this research, this study is a further extension of the service portfolio management literature, which has traditionally lacked in innovation studies (Aas et al., 2017). Importantly, we examine the applicability of widespread private sector innovation management practices into the public sector domain of digital government services. This is important as few studies look specifically at Innovation Process Management and Innovation Portfolio Management to assess the applicability in the public sector and how they can better support digital government services and the creation of public value.

The analysis against the leading innovation management approaches of Innovation Process Management and Innovation Portfolio Management puts a spotlight on government's ability to manage innovation (Bommert, 2010; Borins, 2001). Since introducing the DSS in 2015, the Australian Government has remained committed to managing digital government innovation across multiple organisations. The analysis indicates that the innovation management approach has been adopted and had a positive impact in shaping a large number of key digital government services supporting citizen and partners. As we move beyond the unprecedented period of COVID-19 pandemic, there is an opportunity to reflect on the DSS and apply more contemporary approaches that allow the dynamic management of a diverse innovation portfolio.

Policy considerations arise out of this research. Ultimately, it helps guide government to better manage, evolve, and extend its considerable resource base and innovation portfolio (Meifort, 2016). With comparable standards now in place across the United Kingdom, Australia, the United States, and Canada, there is great opportunity to extend this research to other regions (Department of Finance Canada, 2017; UK National Audit Office, 2017; US Digital Service, 2016). Moreover, as

other countries in emerging economies strive for digital government, there is major opportunity to apply this research across those regions (Chen et al., 2020).

Additionally, while digitally enabled transparency typically creates accountability and encourages a focus on public value (Criado & Gil-Garcia, 2019), the openness of this information may in fact have created a short-term focus on efficiency and stifle experimentation (Torfing et al., 2019). This is most evident in the exceptionally high success rate of innovations seen in the reported sample. It is promising to see a good adoption of these innovation management practices; however, a fuller adoption of the innovation processes likely still requires additional cross-organisational leadership and cooperation to fully institutionalise the changes required (Hjelmar, 2021). This high success rate can also be put down to the innovation programs manifesting itself as a compliance-based box ticking exercise, which has traditionally been a problem with public sector innovation management (Mulgan & Albury, 2003).

There are certain limitations in this research. First, the research considered only assessments on the DTA website. This review recognises that agencies may have adopted the standard without publishing the results on this website. If any data become available on assessments that were not on the website, they could be considered using the research method developed for this paper. Given this analysis was based on publicly available online information, the research would further benefit from more thorough case analysis involving interviews with members of the DSS projects and the final recipients of the government service.

Another limitation to this study is that many agencies run distinct internal innovation management processes. For example, the Commonwealth Department of Treasury has its own Two-Gate ICT Project Delivery Approach⁸ and the Department of Defence, which is the Department with the greatest number of employees without an DSS assessment, has its own Capability Lifecycle with multiple stages and gates⁹. Additionally, there are multiple innovation management strategies and approaches in place across government agencies (Australian Public Service Commission, 2016), which stimulate separate innovation investment portfolios and management processes. Going forward, there is opportunity for further research on the alignment of the DSS with the different innovation practices across government.

CONFLICT OF INTEREST STATEMENT

The authors declare no conflicts of interest.

DATA AVAILABILITY STATEMENT

The data that support the findings of this study are available in Australian Digital Transformation Agency Assessment Reports Website at <https://www.dta.gov.au>. These data were derived from the following resources available in the public domain: <https://www.dta.gov.au/help-and-advice/digital-service-standard/assessment-reports/>.

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ENDNOTES

¹ Digital Service Standard Overview—Retrieved 1 August 2017 (<https://www.dta.gov.au/standard/>)

² DTA Assessments—Retrieved 31 July 2017 (<https://www.dta.gov.au/standard/assessments/>).

³ BloodNet Alpha Assessment—Retrieved 1 August 2017 (<https://www.dta.gov.au/standard/assessments/alpha-assessment-bloodnet/>).

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