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## Digital Capabilities: Getting Ahead of the Curve

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## Digital Capabilities: Getting Ahead of the Curve

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## Abstract

The covid-19 pandemic has been a catalyst for digital transformation, causing organisations to go through complex systemic organisational change. The literature shows that pressure from the public is driving digital transformation, which is causing governments and the private sector to uplift their capabilities. Practitioners and researchers are calling for investments in digital capability. This exploratory field study found fifty-one digital capability initiatives in two governments, which are partitioned into four themes: Ways of Thinking, Ways of Learning, Ways of Doing and Ways of Enabling. The study applies organisational learning theory to show how immediate needs for user-centric and agile capabilities led to second-loop investments in achieving a shift in managers' mindsets through action learning. Respondents reported that third-loop investments were necessary to enlist previously siloed services through reorganisation and changes to funding controls. By achieving all three loops of learning through investing in the four 'Ways of', organisations may get ahead of the digital transformation curve.

**Keywords** Digital Transformation, Digital Capability, Organisational Learning, Australia

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## 1 Introduction

For many organisations, covid-19's physical distancing has driven an immediate digital transformation. Managers are understandably concerned about their organisations' ability to thrive in this new digital world. With staff members working from home, avoiding business travel and servicing customers remotely, the second-order consequences to how we develop products, market, sell, and service are profound. Experience and current actions suggest that adopting digital technology alone will be insufficient.

Researchers have identified a critical need for digital capabilities. However, practitioners and researchers do not have a view of what this means specifically in practice (Vial 2019). This research aims to explore this gap through an interpretive field study taken immediately before the outbreak of covid-19.

We define digital transformation as an organisation-wide prioritisation of digital services and products ahead of analogue physical solutions, which requires new technologies and new ways of working (Fitzgerald et al. 2014; Vial 2019). Digital transformation changes configurations, products and services (Smith and Watson 2019). Private, public and non-profit organisations are transforming themselves to become *digital* (Ebert and Duarte 2018). Public expectations of "transparent, accessible and responsive services" (Dudley et al. 2015, p. 3) are a key driver, and the covid-19 pandemic has made transformation compelling.

Before the pandemic, digital services were a competitive necessity in the private sector (Nwankpa and Roumani 2016; Peppard and Ward 2004). In public service, digital services deliver 24x7 accessibility, improve service quality and reduce costs (Dudley et al. 2015; Peppard and Ward 2004). For the non-profit sector, digital transformation is necessary for action and growth (Leong et al. 2018). Video conferencing is an immediately visible example of digital connections across organisations, departments, customers and suppliers. However, adopting 'digital' requires much more than technical capability.

We draw on the literature to define digital capabilities as the physical, technical, intangible, and human resources necessary for initial and sustained digital transformation (Amit and Shoemaker 1993; Nwankpa and Roumani 2016; Törmer and Henningsson 2020; Warner and Wäger 2019; Witschel et al. 2019). The end state includes new technology, as well as new strategies, structures, boundaries, and governance. Being digital requires new roles, skills and people. Broader than the organisation itself, these include capabilities to 'adapt to business ecosystems' and innovate through collaboration with other network players (Teece 2007, p. 1319). Organisations are embracing this disruption. However, stakeholders want to know if their digital capability investments are in the right areas and are sufficient (Matt et al. 2015).

Organisations have incomplete tools and methods for managing their capabilities. Simpson argues that organisations "make only a cursory attempt to clarify and actively manage their capabilities" (Gluck et al. 2014, p. 59). What they often ascribe to poor strategy execution is instead poor understanding of their capabilities when they formulate their strategy. Organisations must understand how their abilities integrate and then develop a portfolio approach to close the gap between their needs and their abilities.

Digital-focused capability research is appearing, but gaps remain. Vial (2019) proposes a digital research agenda to explore capabilities and how capabilities contribute to digital transformation. This paper reports on a research project that attempts to answer that call by exploring what capabilities practitioners were investing in during calmer, pre-covid-19 times. We apply organisational learning theory to analyse why they were investing in the portfolio. The research uses semi-structured interviews and other techniques to engage with the Australian federal government and the New South Wales (NSW) state government, which were growing their digital capabilities.

## 2 Literature Review

Digital transformation is larger than the integration of technology. Smith & Watson (2019, p. 85) comment that "Like a tapestry, digital transformation is achieved with multiple different threads woven together behind the scenes by several business groups, including IT." These threads include organisations' strategies, structures, governance, processes and external boundaries.

Organisations are reconsidering their corporate strategy (Vial 2019) as digital technologies provide "both game-changing opportunities for – and existential threats to – companies" (Sebastian 2017, p. 197). The diffusion of digital technologies "renders digital transformation relevant for nearly every

industry” (Remane et al. 2017, p. 143). Digital strategy development requires different capabilities to Information Technology [IT] strategy development, which traditionally aligned IT with business strategies to create business value (Bharadwaj et al. 2013; Mithas et al. 2013; Reynolds and Yetton 2015). Today’s digital strategies are a ‘fusion’ of IT and business. Digital strategies embed technology and business objectives into the one strategy (Bharadwaj et al. 2013; Chantias et al. 2019; Drnevich and Croson 2013; Matt et al. 2015; Mithas et al. 2013; Woodard et al. 2013).

An organisation that develops a successful digital strategy is capable of dealing with emergent forces through being comfortable with iterative strategies, which makes them learning organisations (Chantias et al. 2019; Mithas et al. 2013). For example, a digital strategy is never complete because technology evolves despite the strategy, requiring a constant strategic change (Smith and Watson 2019). Four factors driving continual strategic renewal are the speed of digital technology changes, the exponential growth of big data, the rapidly evolving expectations of customers and users, and in 2020, the wholesale adoption of digital technologies due to covid-19 (Dinham 2020). The literature also reports that beyond digital strategy capabilities, digital strategists need to consider the organisation’s other digital capabilities. What often causes a strategy to fail is a “gap between a company’s capabilities and the ones needed to deliver the strategy successfully” (Gluck et al. 2014). Many organisations need new strategic capabilities to adopt this emergent, iterative and responsive approach to strategy. These new strategy capabilities also require structural support to be sustainable.

Digital transformation requires “new ways of managerial thinking” (Horlacher and Hess 2016, p. 5126), with practitioners arguing for the formation of a new team under a Chief Digital Officer (CDO). Horlacher and Hess (2016) identify the CDO as one of the fastest-growing C-level positions. The CDO evidences five significant focal differences between IT and ‘digital’: management control, value orientation, goal achievement, their reference industry and the CDO’s location in the value chain (Tumbas et al. 2018b). Some researchers, including Haffke (2016), view the creation of the new CDO structure as an ‘inflection point’, highlighting a redefinition of the CIO.

The CDO also embodies ‘IT ambidexterity’ (Sebastian 2017) or ‘bimodality’ (Haffke et al. 2016); components of exploitation and exploration; or ‘supply’ and ‘demand’ (Tarafdar and Gordon 2007). In this way, IT and the CIO focus on exploitation, which includes tasks like production, efficiency and implementation. The CDO demonstrates the organisations’ ability to explore through risk identification and management, experimenting, discovery and innovation (Horlacher and Hess 2016). In addition to the CDO’s capabilities, the position of the role in an organisation’s structure demonstrates executive support for digital transformation. With a responsive digital strategy and executive support, organisations must be able to deliver transformation with agile change programs holistically involving multiple functions and external organisations.

Digital work is typically agile – it is iterative and experimental (Tumbas et al. 2018b), fast (Dorner 2015), collaborative (Chantias et al. 2019) and involves constant engagement with end-users (Simonofski et al. 2018). Digital requires practitioners to blend business and technology in developing business processes and technology simultaneously and iteratively. Teams work in agile ways. Although agile is mature in software development, the ‘Manifesto for Agile Software Development’ was published approximately twenty years ago (Beedle et al. 2001), digital organisations must be capable of being agile across the entire organisation. Some researchers go so far as to define digital as the ability to be agile (Dorner 2015; Smith and Watson 2019).

We have demonstrated above how research finds that for a digital transformation to succeed, an organisation must be able to develop responsive strategies through exploration, risk and external sensing. They need to be thoroughly agile in their work processes to pivot and respond to their evolving strategies. Next, we turn to what research finds are the necessary capabilities in technology, social interpretation, and environment management.

Digital technologies are the ‘fuel’ for organisational disruptions (Sousa and Rocha 2019; Vial 2019). Organisations must be capable of managing “combinations of information, computing, communication and connectivity technologies” (Bharadwaj et al. 2013, p. 471). These include social media, mobile, analytics, cloud and the Internet of Things (Bharadwaj et al. 2013; Sebastian 2017). For example, organisations must be competent with social media to engage customers and users (Schlagwein and Hu 2017), placing the organisation at “the centre of a vast network” (Leong et al. 2018, p. 173). An ability to internalise technology is necessary (Sousa and Rocha 2019). Digital technologies, such as the IoT, Cloud, Big Data and mobile technologies, are driving the need for specific competency development (Sousa and Rocha 2019).

A flexible transformation is not chaotic; it needs guiding principles. Foremost amongst these is the role of the user or customer. Organisations need to be able to place the user or customer at the centre of everything (Simonofski et al. 2018; Vial 2019). For digital transformation, the user is paramount (Bharadwaj et al. 2013; Haffke 2016; Rickards et al. 2015; Setia et al. 2013; Tumbas et al. 2018a), requiring the ability to be human-centric. As a guiding principle, this human-centric ability needs rigour to give confidence in the transformation. Users are not always external customers. They could be suppliers, collaborators or staff members. The ability to see the user across boundaries is necessary to enlist the full digital ecosystem.

An ability to harness external resources is powerful in the context of a shift from analogue relationships to digital relationships (Bharadwaj et al. 2013; Mithas et al. 2013; Tumbas et al. 2018b). Tumbas et al. (2018b) acknowledge the ‘outside-in’ perspective of the digital era, with the external environment being influenced by, as well as an influencer of, organisations’ digital efforts (Mithas et al. 2013). The ability to include external resources finds support from modern digital technologies that allow for work across boundaries of time, distance and function (Bharadwaj et al. 2013; Sambamurthy et al. 2003).

The literature finds a useful set of digital capabilities such as responsive strategy development, exploration, agility, technical competence, human centricity and ecosystem engagement. The literature contains calls for understanding the specific practices necessary for digital transformation (Vial 2019); that is what “organizational actors actually do, on a day-to-day basis” (Karpovsky and Galliers 2015, p. 136). Studies of the practical actions practitioners are taking to improve their capabilities may be a useful line of enquiry (Peppard et al. 2014), not least because the findings would be actionable by other practitioners.

This research attempts to contribute by exploring the *practices* in digital capability building. Adopting an interpretivist approach, we aim to understand the specifics of digital capability uplift. Our guiding question is: Which digital capabilities are practitioners investing in, and how are they investing? This paper reports on the findings before discussing the practitioners’ motivations for their practices, which it does through an organizational learning theory lens.

### 3 Research Study

This study seeks to develop preliminary ideas about digital capabilities in practice following Neuman (2006, p. 33). It uses an interpretive paradigm “to describe and understand phenomena in the social world and their meanings in context” (Cecez-Kecmanovic and Kennan 2017, p. 137). We looked for research sites where investment success reporting would be available. Publicly available reporting led us to the government where probity requirements typically mean post-implementation reports are public. We sought leading digital governments because some governments have been slow to adopt digital. In this way, Australia was ideal. The UN recognises digital Australian government services as being in the top three in the world (United Nations Department of Economic and Social Affairs 2020).

Further, we had good access and prior knowledge of Australian Federal and State government agencies<sup>2</sup>. The Federal Government has 240,000 employees. The total budget is \$505 billion for 2019-2020 (Australian Government 2019), much of which it allocates to the states and territories, such as NSW. The NSW State Government has 330,000 full-time equivalent employees (NSW Premier & Cabinet 2019), and a budget of \$83 billion (NSW Government 2019).

### 4 Data Collection

Two of the researchers were also practitioners in digital transformation<sup>3</sup>. During the research period, the Australian government engaged the researchers through the Australian Federal Government’s

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<sup>2</sup> In the balance of the paper we refer to the Federal and State governments rather than the full titles.

<sup>3</sup> Sargeant has four years of practical experience in digital transformation. Roles involved project management, analysis and capability building. Whilst at the Australian government’s DTA, Sargeant’s responsibilities included strategy, project and event management and sourcing capability building. Thorogood has thirty-five years of global experience in digital transformation. These roles include software development, support and sales, project management, product management, strategy consulting, and capability building – both internally and within ecosystems. As Head of Digital Strategy at the DTA, Thorogood’s responsibilities included strategy, internal capability building, and harnessing supplier ecosystems.

Digital Transformation Agency. One was a member of the senior executive service, and the other was part of the strategy and sourcing capability teams. As part of their work, they engaged with peers in the State government to collaborate in delivering joined-up digital services.

During the research, the team collected data in two ways. One was as participant observers. The other was through formal interviews and carefully collecting material. As participant observers, the researchers took part in everyday activities and conversations in the agencies, online and in-person. Online was by various technologies such as Skype and Slack. We also took part in meetings, seminars and conferences. We read and wrote documents about digital capability, held training courses for others, and attended the training. We prepared budgets and authorised expenditures to support capability building. Our planning for capability building covered five years but focused on the next year, with public reporting and adjustment to the plans each year. We developed videos and websites to help publish the digital transformation journey<sup>4</sup>.

Activities included working with state governments, which we met frequently. We also met separately with governments in the UK, USA, Denmark, Bavaria, and Wallonia. One two-week trip across Europe resulted in a dozen interviews and workshops. The researchers presented the findings of these engagements to conferences and reported back in a public service outlet, *aPolitical*.

Throughout this period, the researchers engaged in informal discussions with colleagues and took extensive notes. Colleagues frequently reviewed the notes, particularly when engaging with other governments. The researchers conferred daily to share learnings and explore the subject as practitioners.

As participant observers, the researchers had access to relevant technical and policy documents, such as cabinet papers, whole-of-government employee capability surveys, agency strategies, readiness assessments, and supplier capability assessments that were essential to understanding the digital transformation process. Some of these documents were confidential and not part of the empirical material.

Formally, the researchers interviewed managers from the NSW State Government and the Federal Government. They were deliberate in selecting those individuals involved in digital transformation or specifically building digital capability. Professional connections with the research sites helped to introduce participants. Purposeful sampling further extended the participants (Lincoln 1985). Many of the interview participants suggested other people for engagement. This snowball technique was useful.

These interviews ranged from 40 to 60 minutes in length and were semi-structured. Semi-structured interviews were useful as they allowed for interviewees to offer thorough accounts, including their views, experiences and motivations (Gioia et al. 2013). They were an alternative lens on the topic to the participant-observer lens. Interviews were at the respondents' premises, allowing observations of the work environment and the use of visual aids (Neuman 2006). Meeting with each interviewee at their workplace meant that we could consider their office environment and setting. We asked what agencies are doing to uplift their digital capability. Unstructured questions helped the researchers explore emerging areas. We recorded all interviews and transcribed the recordings verbatim after each interview.

## 5 Analysis

Following the hermeneutic approach, we began the analysis process before completing the data collection. During data collection, we inductively analysed the data from previous interviews (Corley and Gioia 2004), whilst proceeding with other interviews in parallel (Langley 1999; Lincoln 1985). Data analysis began before and continued throughout the interview processes.

As an integral part of qualitative data analysis, concept formation began during data collection (Neuman 2006). As Neuman (2006, p. 459) describes, "Qualitative researchers look for patterns or relationships, early in a research project, while they are still collecting data". We referred to secondary material before interviews for preparation, and during and after interviews for additional information and clarification purposes.

To support the conceptualisation process, we performed what Neuman (2006) describes as "compulsive" note-taking. Before interviews, we made preliminary notes based on secondary material from public websites.

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<sup>4</sup> See <https://www.dta.gov.au/digital-transformation-strategy> for the artefacts.

While reading through each interview transcript, we began developing open codes in NVivo 12<sup>5</sup>. During the process of open coding, and as we read more transcripts, similarities across the interviews became apparent. To capture these similarities, we created another memo file. We continuously updated this memo file throughout while analysing and coding the remaining interview transcripts.

After open coding, we iteratively performed higher-level coding. This coding examined and categorised initial codes into themes, facilitating the emergence of new ideas. Initial grouping of codes forms a “governing structure” (Miles 1994). We used post-it notes and NVivo 12 as the primary tools. Our coding identified common initiatives and four emergent dimensions.

Saturation became evident through the interview process, with minimal new insights emerging in the last few interviews. By organising what Neuman (2006, p. 459) calls “specific details” through repeating the iteration process numerous times, we experienced “bursts of insight”, which is what typically leads to research findings (Wolcott 1994).

## 6 Findings

Across the two governments, we identified fifty-one initiatives to uplift digital capabilities, including establishing the Australian Digital and Data Council, Digital.NSW, Digital Marketplace, Leadership Academy, and installing multi-agency Microsoft Teams. We grouped these initiatives into thirty-one themes and four dimensions.

Themes included digital mindsets, learning through doing, agile project management, user-centric practices, working in multi-disciplinary teams, and information sharing and collaboration. After the interviews, we discussed the themes with the respondents who felt that they made sense to them.

Subsequently, we grouped the themes into four dimensions and re-verified those dimensions with respondents. Figure 1 presents the four dimensions: Ways of Thinking, Ways of Learning, Ways of Doing and Ways of Enabling.

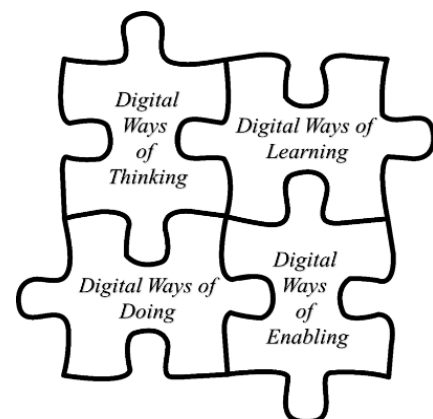


Figure 1: Digital Ways of

### 6.1 Digital Ways of Thinking

Respondents thought a ‘digital mindset’ was necessary throughout an organisation. The State government explicitly calls for the digital engagement of frontline staff, backend-systems operations staff, policy/strategy staff, specialist digital staff, senior executives, and CEOs/Secretaries.

Interviewees emphasised shifting executive mindsets. For example, Interviewee 2 said, “...if you do not have the head of the organisation supporting it, don’t even try”. Respondents identified three reasons for this focus on executives. First, people at senior levels tend to resist digital practices. They are comfortable and have achieved success with the traditional ways of working. Deprecating their previous skills may make them uncomfortable and resist the change. Second, senior people typically have more established power than incoming digital natives. Harnessing that power would be useful for digital transformation. Third, senior executives drive agency culture, which makes them essential supporters because digital transformation involves “a big cultural shift” (Interviewee 7). Senior executive buy-in increases the legitimacy of practitioners’ digital efforts.

The NSW State Government and the Australian Federal Government have “programs that are centred around... senior executives, to get them to shift their mindset and get them to shift their ideas of how to work” (Interviewee 7). The critical programs are the Leadership Academy for the State Government and the Leading Digital Transformation Program for the Federal Government.

### 6.2 Digital Ways of Learning

Ways of learning investments included new delivery techniques, new physical spaces for collaborative learning, and new communities to share learnings. For delivery, interviewees emphasised the importance of learning through doing, problem-solving and collaborating. They sought ways to combine

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<sup>5</sup> <https://www.qsrinternational.com/nvivo-qualitative-data-analysis-software/home>

all three. These delivery techniques included new workshop components. Interviewee 3 said, “when you give people a problem to work around, the learning can be a lot more effective, both in terms of actually delivering a change, but also allowing people to practice what they’ve learned”.

One challenge they overcame was having to rent space for collaborative learning. Respondents felt that shared meeting spaces were difficult. The focus on multi-agency delivery meant that all agencies and the private and non-profit sectors had to meet regularly. In some cases, one large agency would take the lead and build physical learning environments to share. In others, small central functions made the investments. These spaces became focal points for new budgets, people, processes and techniques to support digital ways of learning. These ‘Hubs’ included the Digital.NSW Accelerator, the Future Transport Digital Accelerator, coLab and the Policy Lab. The Hubs became symbols of the new openness.

Respondents also reported investments in knowledge sharing. There were specific investments in communities of practice. GovX<sup>6</sup> is an example, which is a life event community of practice that facilitates learnings across the Federal Government and is also open to state governments. Another example is the Federal Government’s Digital Practice Circles targeting middle managers. The Practice Circles are a “peer-based, practice-based approach to coaching and mentoring. The program aims to help build digital confidence, skills, connections and networks” (Digital Transformation Agency 2019).

### 6.3 Digital Ways of Doing

The new digital way of working “is actually quite foreign to most public servants” (Interviewee 4), which was challenging. One digital practitioner said, “you have to be mindful about how far you can push them” (Interviewee 5). Investments in this area build up skills - such as user research, content design and development - to support the creation of human-centred and agile multi-disciplinary teams.

‘Doing’ refers to design, development, delivery and improvement. For example, the life event journey mapping encourages joined-up and streamlined services to citizens. Life event journeys focus on what citizens need when interacting with public, private and non-profit sectors. Executives reported that collaboration between private and public sectors was necessary for delivering life event services (Brookes 2020). Learning how to map these journeys helped to bring together government agencies across council, state and federal jurisdictions, and private sector service providers such as undertakers, driving instructors, and banks.

We found reports that user-centricity and agile skills are good interplays. The ability to pivot and embrace users’ needs, even when surprising, is a critical capability. However, agencies have been slow to adopt agile practices. They use it for “non-critical, non-business core systems” (Interviewee 6), and intermingle it with traditional methodology. Managers do not see agile as safe for large scale service development. “It isn’t quite there, but it is happening” (Interviewee 6).

Digital.NSW adopted the life event journeys approach. Rather than focusing on a citizen’s interactions with each service, “the overarching aim of life journey services is to improve citizens’ experience by providing unique and tailored access to all the service-related interactions they have at points in their life journey, whether that is having a baby or grieving for a loved one” (Andrews 2018). Service transformations aimed to “get a common understanding of citizen pain points, which allows agencies to collaborate and design seamless, holistic services for citizens during major life events” (Digital.NSW-Accelerator 2019).

A further complication to this collaborative approach was that agencies were operating in mandate- and budget-driven silos. The silos were significant barriers to delivering effective digital services for life events. Some form of restructuring was imminent.

### 6.4 Digital Ways of Enabling

Our research found that enabling involved significant changes in restructuring and in budget reallocations. Both the State and Federal governments invested in new specialist agencies of technical experts. Digital.NSW and the Federal government’s Digital Transformation Agency (DTA) had a whole of the (respective) government mandate. They help other agencies with their development and delivery of services. They also manage their whole of government digital strategies. For example, in May 2017,

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<sup>6</sup> The Australian GovX is not the US GovX (see <https://en.wikipedia.org/wiki/GovX>), which is unrelated.



Digital.NSW released the NSW Digital Government Strategy. With a vision of transforming “the lives of the people of NSW by designing policies and services that are smart, simple and seamless”, the strategy sets out three priorities: “customer experience, data and digital on the inside” (Digital.NSW 2017).

Senior respondents with a background in digital said it was clear that multi-organisation collaboration was necessary to deliver a coherent digital service. However, organisational structures were a barrier to cooperation with significant “fragmentation of government” (Interviewee 3) hindering collaboration across agencies, and between government and non-government organisations.

Structural initiatives resulted in significant reorganisations. In the State, Machinery of Government (MoG) changes merged agencies into eight clusters (NSW Premier & Cabinet 2019), which facilitated a citizen-centric service view. The MoG also established the Delivery and Performance Committee alongside Cabinet to address digital or data components of every policy proposal (Hendry 2019). A Federal MoG moved the DTA into Services Australia albeit keeping the DTA’s independence.

Aligning funding with agile digital practices saw the State set up a Digital Restart Fund. The Fund lessens the issues experienced with funding by changing traditional funding structures to support agile practices and initiatives.

## 7 Discussion

This research paper addressed how organisations are investing in digital capabilities. We found that the Ways of Doing investments address gaps in functional capabilities. The Ways of Thinking investments are necessary to help the Doing investments; they include new digital models for management thinking and processes. Similarly, learning investments aligned delivery with outcomes. Finally, enabling investments restructure how those governance changes appear. Enabling initiatives moved and changed the composition of organisations to facilitate new power relationships and processes. In this section, we explore these investments through an organisational learning theory lens to unpack the motivations behind the investments.

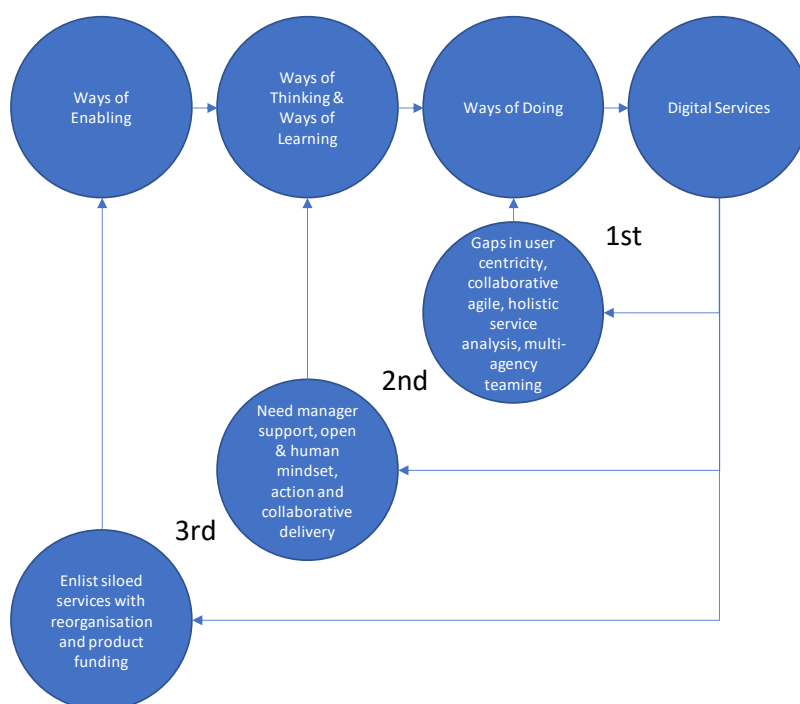


Figure 2: Organisational Learning of Digital Capabilities

Organisational learning theory posits learning occurs in at least two levels (Argyris and Schon 1974) – first, an “action oriented, routine and incremental” (Tosey et al. 2012, p. 292) and second, changes to governance frameworks, policies and processes (Cyert and March 1992). Some posit the third level of

reflective learning that involves how governance changes emerge (Snell and Chak 1998a)<sup>7</sup>. We adopt the three-loop approach, which Figure 2 illustrates.

Single-loop learning involves improving the system as it exists. Digital Ways of Doing is an example. Improving capabilities such as content development, user-centricity, and agile development was to meet immediate requirements for digital service development. We found respondents frustrated by governance that did not allow them to pivot and change project outcomes rapidly according to constant user feedback. They felt that management and processes did not support the digital Ways of Doing.

Double-loop learning reflectively addresses governance challenges that single-loop learning is unable to resolve (Argyris and Schon 1974). The frameworks, or mental models, that managers use to control digital services changed through Ways of Thinking investments. Similarly, Ways of Learning investments changed the coursework delivery so that it became more collaborative and thereby improved learning outcomes. Single-loop and double-loop investments were necessary.

Triple-loop learning involves changing the context in which double-loop learning emerges (Snell and Chak 1998b). It requires significant, systemic changes to the organisational system. The Digital Ways of Enabling investments did two things. One was the wholesale MoG changes. To become digital, the governments created central digital functions, then reorganised their service deliveries entirely and moved the central functions into the service delivery agencies. The State government consolidated service agencies. Governance of digital became digital service governance. The other change was the establishment of budgets to help with digital ways of working.

The significant and sustained change required investments in all three loops of organisational learning. Investment in each identified where further investments in others were necessary. This research found that digital capability building is an ongoing iterative process.

## 8 Conclusion

Covid-19 has forced leaders to reconsider the importance of digital capabilities within their organisation and their ecosystem. This study, undertaken before the covid-19 outbreak, provides some indication of what may follow. The paper usefully develops an understanding of how organisations may invest.

Performing an interpretive field study with practitioners, this research paper partitions organisations' digital capabilities into four dimensions of change: they practice the "Ways of Doing" by working iteratively in multi-disciplinary teams and placing users as the central focus. The practitioners deploy 'Ways of Thinking' when they need to adopt open and 'digital' mindsets, particularly in senior executives. They apply the 'Ways of Learning' by learning through doing or learning through problem-solving and collaborating techniques. Finally, they enable digital ways of working by changing traditional structures and rules – to exercise 'Ways of Enabling'.

This research found that organisations should consider capability investments holistically. Single-loop learning will be insufficient, and the investments will not yield expected returns. Although double-loop investments in Ways of Thinking and Ways of Learning will improve the returns on the single-loop investments, wholesale restructuring will inevitably be necessary through triple-loop learning.

This paper is a small step towards understanding digital capability building. This study contributes by exploring the under-researched topic of the specific, or micro foundational, digital capabilities, which it finds is complex and requires holistic analysis. For digital transformation to be successful, organisations' capability uplift efforts must involve all three loops of learning- single, double, and triple-loop. Triple-loop learning, which requires significant changes to the organisational system, is the most profound. It is the enabling piece to achieve sustainable changes necessary for transformation but requires single- and double-loop investments for enough motivation.

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<sup>7</sup> There is an argument that covid-19 has forced such radical rethinking that there is quadruple loop learning (Lee et al. 2020).

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