MIS Quarterly Executive

Setting Priorities for Exploiting and Exploring Digital Capabilities in a Crisis

Organizations' digital capabilities are often central to their survival of a crisis. In times of crisis, IT leaders must decide whether to exploit their current digital capabilities ("making the best of what you have,") explore new capability development ("do new things or better things") or do both. Based on an in-depth study of COVID-19 crisis responses of 18 Australian organizations, we recommend how IT leaders should prioritize exploitative or explorative capability development and best position their organizations for the next crisis.[1]

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Crisis Responses Require a Balance Between Exploiting and Exploring

Crises are pervasive and organizations might face new health, energy, supply chain or geopolitical crises, to name a few. For example, the physical limitations and movement restrictions imposed by governments during the COVID-19 health crisis impacted how organizations work and interact with their customers and partners. Contrary to carefully crafted and planned transformation strategies, this pandemic necessitated an immediate response. Many organizations had to rely extensively on digital capabilities to respond to this existential crisis. Indeed, prior research[2] has shown that fast-paced, rapid digitization and digitalization underpinned organizations' responses to COVID-19.

Ambidextrous organizations can cope in times of crisis through either exploiting existing capabilities ("doing the best with what you have") or exploring new possibilities ("doing

1 Anna Sidorova, Vess Johnson and Paul Di'Gangi are the accepting senior editors for this article.

2 For articles on the impact of the COVID-19 crisis on digital transformation, see: 1) Faraj, S., Renno, W. and Bhardwaj, A. "Unto the Breach: What the COVID-19 Pandemic Exposes about Digitalization," *Information and Organization* (31:1), February 2021, article 100337; 2) Wade, M. and Shan, J. "COVID-19 Has Accelerated Digital Transformation, but May Have Made it Harder Not Easier," *MIS Quarterly Executive* (19:3), September 2020, pp. 213-220; and 3) Carugati, A., Mola, L., Ple, L., Lauwers, M. and Giangreco, A. "Exploitation and Exploration of IT in Times of Pandemic: From Dealing with Emergency to Institutionalising Crisis Practices," *European Journal of Information Systems* (29:6), November 2020, pp. 762-777.

DOI: 10.17705/2msqe.00070

new things or better things.")[3,4] But which approach should organizations follow in a crisis? If exploration is overemphasized, they risk overstretching scarce resources without gaining an immediate payback or the benefits required for survival. But by focusing on exploitation, organizations will likely find themselves trapped in suboptimal equilibria and become captives to outdated competencies and technologies. Overemphasizing exploitation might therefore lead to competitive disadvantage and the decline of long-term performance once the immediate crisis is over. It can also hinder fast decision-making for critical issues. In times of crisis, organizations thus need to strike a balance between exploiting and exploring if they are to adequately adapt to rapidly changing environments.

Whatever the next crisis might be, digital capabilities will again likely be a central element in an organization's crisis response. Hence, CIOs and other senior IT leaders at the onset of a crisis, need to determine the best response in terms of prioritizing exploitation or exploration for developing digital capabilities. Given their organization's specific starting position, they need to identify which crisis response should be pursued to maximize value. More broadly, they need to determine how best to position their organization for the next crisis.

Overview of Research and Findings

In this article, we provide recommendations for IT leaders that will guide their decision-making in preparing their organization to respond to the next crisis. Our recommendations are derived from the findings of an empirical study of 18 Australian organizations operating in different industries and with different levels of digital capability development. All 18 were at the forefront of the COVID-19 crisis, and to preserve their anonymity are referred to by pseudonyms, as are the 27 IT leaders in these organizations we interviewed in depth. The empirical data derived from the detailed notes for each interview was supplemented with secondary data such as information from official company websites, internal company documents, news reports and publicly available podcasts. The Appendix provides details about the research methodology, including summary information about each organization and the interviewees.

First, we recommend that organizations assess their starting position at the onset of a crisis. The starting position encompasses the organization's specific situation in terms of five key factors: *people*, *cultural*, *technical*, *managerial* and *financial*. This starting position will largely determine which of the three types of crisis response—*Survival*, *Survive* and *Thrive* and *Thrive and Drive*—should be pursued and the resulting prioritization of exploitation or exploration, or both.

An organization is forced into the Survival crisis response if most of the factors hinder its digital capability development. In this situation, we recommend focusing only on exploiting existing digital capabilities. But, if most of the factors are conducive to digital capability development, the organization should consider the Survive and Thrive crisis response. Here, we recommend initially focusing on exploiting digital capabilities followed by the exploration of new capabilities. If most of the factors facilitate accelerated digital capability development, we recommend the Thrive and Drive crisis response. Here, the organization would initially focus on concurrently exploiting and exploring digital capabilities, and later prioritize the exploration of new capabilities.

Our next recommendation applies regardless of the crisis response pursued, and concerns maximizing value during the crisis. Finally, we provide a recommendation for how organizations can escape the confines of the survival response and progress toward thriving and driving the business forward.

3 In ambidextrous organizations *exploration* includes things such as search, variation, risk taking, experimentation, play, flexibility, discovery and innovation, while exploitation includes such things as refinement, choice, production, efficiency, selection, implementation and execution. For definitions of exploration and exploitation, see March, J. G. "Exploration and Exploitation in Organizational Learning," *Organization Science* (2:1), February 1991, pp. 71-87.

4 Examples of developing explorative digital capabilities include Space X's risk taking with reusable rockets and Google's experimentation with autonomous vehicles.

Table 1: Five Factors to Consider When Prioritizing the Focus of Digital Capability Development

Factor	Definition[5]	Observations of Digital Capability Development
People (digital skills and knowledge)	A firm's human resources, specifically employees' knowledge and understanding of the organization's underlying core digital technology, products, services and markets.	• Organizations prioritizing the exploitation of digital capabilities retained key staff with skills necessary for survival. Some cut back ancillary staff and services. • Organizations prioritizing both the exploitation and exploration of digital capabilities hired additional people with new digital skillsets.
Cultural (values and norms)	Collective values and norms are constantly reinforced by corporate leaders and embedded in management practices, risk appetites and empowerment of key individuals.	• Organizations with risk-averse cultures prioritized the exploitation of digital capabilities. • Organizations with risk-tolerant cultures and a strong innovation drive, prioritized both exploitation and exploration of digital capabilities, sequentially or concurrently.
Technical (systems and infrastructure)	The technical element of digital capabilities, comprising systems, procedures, tools, standards and practices, embodied as shared technical services and digital infrastructure across the enterprise.	• Organizations with limited digital infrastructure prioritized foundational exploitation of digital capability development. For some, the crisis elevated their technology needs, requiring rapid updates to foundational capabilities for both survival and expansion. • Organizations with extensive digital infrastructures prioritized both exploitation and exploration of digital capabilities sequentially or concurrently.
Managerial (leadership, processes, procedures and policies)	Managerial skills, leadership, processes, policies and incentives geared toward achievement of the organization's mission and vision. Reflected in formal and informal approaches to managing change, encouraging innovation and effectively competing in the market.	• Some organizations lost key technology leaders to early retirement or due to financial pressures. Others acquired new technology leadership to lead the strategic deployment of exploitative and explorative technologies for survival. • Organizations with less mature digital processes were more likely to focus on exploiting digital capabilities.
Financial (liquid assets and investments)	Financial resources, retained earnings and capital position that enable an organization to pursue its goals and objectives.	• Organizations with financial constraints (e.g., due to loss of markets, customers) focused on exploiting digital capabilities. • Organizations with strong financial positions pursued both exploring and exploiting digital capabilities, sequentially or concurrently.

Five Key Factors to Consider When Assessing the Starting Position

Based on the empirical evidence from our research, it became clear that an organization's starting position depends on five key factors. These factors set the context in which digital capability development takes place and influence the prioritization of exploiting and/or exploring digital capability development (see Table 1).

Some of these factors fluctuated quite rapidly during the pandemic (e.g., some organizations' financial situations deteriorated quickly, new

5 Barney, J. "Firm Resources and Sustained Competitive Advantage," *Journal of Management* (17:1), March 1991, pp. 99-120.

Table 2: Traffic Light System for Assessing the Five Key Factors

Traffic Light	Examples
Indicates factors that are hindering digital capability development.	Extreme financial pressures due to COVID-19 crisis impact.
Indicates factors that prepare the ground for digital capability development.	Staff redeployed from areas affected by the COVID-19 crisis to support new strategic initiatives.
Indicates factors that are accelerating digital capability development.	Predictive analytics and technologies deployed for automation and innovation.

technical systems were rapidly acquired via partnerships, key IT leaders moved on), while others were more static and less prone to short-term change (e.g., culture, people's skills and knowledge).[6]

We propose that IT leaders use a simple "traffic light" system[7] to assess their organizations' specific starting position against these five factors (see Table 2). Traffic light color coding makes it easy to identify hindering, conducive and accelerating conditions at a glance (akin to a risk assessment matrix) to inform your organization's prioritization of digital capability development.

How the Starting Position Determines the Crisis Response

The 18 organizations we studied had different positions at the start of the COVID-19 pandemic. First, we observed that when most of the five factors hindered digital capability development (i.e., lots of 🔴 and some 🟡), the organizations pursued the Survive crisis response. This response required repurposing existing capabilities or absorbing new capabilities to support both front-end and back-end business operations to maintain the status quo and to protect existing markets. Second, when most of an organization's factors were conducive to digital capability development (less 🔴 and more 🟡 or 🟢), they adopted the Survive and Thrive crisis response. This response initially required scaling up and accelerating the exploitation of digital capabilities to survive and then subsequently exploring new digital capabilities for entering new markets. Third, if most of the factors facilitated accelerated digital capability development (mostly 🟡 and 🟢), organizations adopted the Thrive and Drive crisis response. This response required well-developed exploitative digital capabilities to quickly reconfigure existing capabilities to deal with disruptions while simultaneously deploying new digital capabilities to drive innovation in products, markets, business models and ventures. The deployment of the three types of crisis responses is summarized in Table 3.

Below, we describe how three representative cases from the 18 we studied each pursued one of the three types of crisis response. These cases represent three of the business sectors most heavily impacted by COVID-19—education, aged care (aka elder care) and infrastructure. In addition, for each type of crisis response, we describe the actions taken by other organizations in the study.

The Survive Crisis Response

Pacific East University

Pacific East University (PEU) is a large Australian educational institution with more than

6 For more on the rigidities of core capabilities, see Leonard-Barton, D. "Core Capabilities and Core Rigidities: A Paradox in Managing New Product Development," *Strategic Management Journal* (13:1), June 1992, pp. 111-125.

7 For use of the "traffic light" system in the context of strategy development, see Kaplan, R. S., Norton, D. P. and Rugelsjoen, B. "Managing Alliances with the Balanced Scorecard," *Harvard Business Review* (88:1), January-February 2010, pp. 114-120.

Table 3: Exploitation and Exploration Prioritization for the Three Crisis Responses

Crisis Response	Purpose of Exploitative Digital Capabilities	Purpose of Explorative Digital Capabilities	Priority
Survive	• Repurpose and absorb	• Protect existing markets	• Exploitation
Survive and Thrive	• Adapt and scale up	• Extend reach to new markets	• Exploitation first, then exploration
Thrive and Drive	• Reconfigure and deploy current and dormant capability	• Extend reach to new markets • Increase product/service range • Drive new ventures through introduction of new business models and digital innovation	• Concurrent exploitation and exploration, followed by sole focus on exploration

5,000 employees and annual revenue of AU$1.22 billion ($760 million).[8] It has a large student population across multiple campuses and has a strong online presence delivering educational services to remote domestic and international students. It pursued the Survive crisis response to the COVID-19 pandemic.

At the onset of the pandemic, due to the loss of international students and a shrinking domestic market, the university faced financial pressures that resulted in staff cutbacks and thus persisted with its risk-averse culture. In particular, it minimized new investments, as explained by Oliver, deputy chief digital officer at PEU: "We've lost lots and lots of income. … It's really hard to focus on scaling up because you [are] almost by default in a survival mode. … Let's just get through this period." Peter, PEU's chief digital officer, elaborated that the university should strengthen its digital capability development: "If you want to pivot really radically, you need to be built on really solid foundations. … We needed to fix up those foundations first." This point was further corroborated by Oliver who said: "The business model was pretty solid, but the operating model was a little bit shaky, … [just like] a house that was a good-looking house but was built on slightly shaky foundations."

PEU was already using existing digital platforms, such as Zoom, Skype and Microsoft Teams, to deliver online teaching for on- and off-campus students, and at the start of the pandemic established a centralized repository to access information about new teaching delivery modes to support the faculty. As Oliver described: "Zoom had gone in quite well, been accepted very well by our community. So, it was just managing load and making sure nothing broke, and it all went very, very well." He further added: "We then went through every single one of our services in our service catalog and just made sure that they were all remote-friendly."

During the crisis, PEU adopted robotic process automation (RPA) to streamline and automate back-end processes in finance, and integrated existing digital systems for process efficiency (e.g., vaccination registration, research system integration etc.). Oliver commented: "We have undertaken various integrations amongst systems. For example, when staff members record their vaccination status, it is integrated with the swipe card access-control system. So, if you have not recorded your vaccination status you are not allowed in through the door." However, the sudden departure of a senior IT executive hindered new investment in explorative digital capability development. The loss of this senior IT leader impacted PEU's strategic IT investment planning and vision. PEU largely exploited existing digital capabilities with little emphasis on innovation to seize opportunities post-crisis.

In summary, PEU prioritized exploitative digital capabilities for surviving. Specifically, it repurposed its existing digital capabilities and absorbed new capabilities to support both front-end and back-end business operations to persevere through the crisis. The traffic light assessment of the five factors at PEU at the start of and during the pandemic is shown in Table 4.

8 Currency conversion rate as of October 2022.

Table 4: Assessment of the Five Factors at Pacific East University

People	Cultural	Technical	Managerial	Financial
● Extensive staff cutbacks due to financial pressures (O)* ● Loss of IT leadership due to sudden departure from the university (D)	● Risk-averse culture, reinforced by financial constraints due to reduced revenue (e.g., loss of international market) (O)	● Accelerated the adoption of Zoom, Skype, and Microsoft Teams amongst academics and students (O) ● Established centralized repository to access information about new teaching delivery modes (O)	● Centralized administrative and support services (D) ● Improved efficiency and effectiveness of current processes (D)	● Focused on using existing financial resource base (O) ● Directive from leadership not to pursue new investments (O)

* Abbreviations: O for onset of the crisis (within the first six months) and D for during crisis (after the first six months)

Actions Taken by Other Case Companies Pursuing the Survive Crisis Response

Andrew, Healthcare Co.'s CIO, pointed to the company's financial struggles: "Once we [started] putting people on leave, … the organization was operating as a cost-recovery arrangement rather than a profit arrangement." Ben, director of IT solutions planning and design at Healthcare Co., elaborated on the negative people experiences: "When the crisis initially hit, there was a sort of scrambling to look at how we could reduce those costs to I suppose survive this. We looked [at forcing] staff to take leave, especially if they had excess annual or long-service leave." He further reflected on the suboptimal technology solution at Healthcare Co.: "It was more around the technology platforms [and] most of the solutions we came up with weren't ideal because we didn't have the platform abilities in place to respond quickly. I think that was the main noticeable gap."

Ivan, general manager of IT at IT Tech Black Co., talked about the company's divisive managerial decisions: "Especially with [COVID] hitting so hard in Lombardi [Italy], we reacted very quickly in a very negative and pessimistic view of things. … Did we really need to stand down those five people in Australia? … Through bad decisions, we put ourselves in a more negative situation than we needed to be." He further mentioned the unrealistic social norm expected from employees working from home:

> *"We implemented quite quickly a series of more [virtual] social gatherings to encourage the team to be interacting with each other on a regular basis. … We had a Friday night [virtual] drinks for a few weeks, but it felt a bit forced … [and] we basically knocked that on the head. … It very quickly felt a little bit artificial and a little bit false."*

Survive and Thrive Crisis Response

Aged Care Company

Aged Care Company (ACC) is a not-for-profit aged care service provider with AU$133 million in annual revenue. It provides home care, retirement living and residential aged care services and has been around for about 200 years. This company pursued the Survive and Thrive crisis response to the COVID-19 pandemic.

During the pandemic, ACC faced workforce challenges due to staff availability, accessibility, and financial pressures resulting from the need to comply with government regulations. Zack, head of IT operations at ACC, mentioned: "We have a large number of volunteers that come through our doors … [and] the lockdown itself and the restriction of visitors and nonessential personnel into the business did create somewhat

Table 5: Assessment of the Five Factors at Aged Care Company

People	Cultural	Technical	Managerial	Financial
🔴 COVID-19 created workforce challenges (O)*	🟡 A new digital-native IT leader brought new vision for innovation and increased risk appetite for technology implementation (D)	🟢 Implemented technologies and data analytics to support patient consultation, outside family communication and predict service requirements (O) 🟢 Invested in cybersecurity to reduce the risk associated with remote consultations (O)	🟡 Recognized the need for a solid foundation (e.g., integration of systems) (O) 🟡 Postponed the introduction of an ecosystem of IT applications for smart operations (O) 🟢 Appointed visionary IT leader (D)	🔴 Limited access to financial resources due to the nature of the aged care industry and government-imposed compliance requirements (O)

* Abbreviations: O for onset of the crisis (within the first six months) and D for during crisis (after the first six months)

of an impact." He further elaborated that the IT organization invested in and implemented communication technologies, data analytics and cybersecurity to support remote operations:

> *"We very quickly loaded up WhatsApp and Skype and Zoom and a few other things [onto] those tablets and submit [for use in] our [residential] homes, and ... for the first time[this] enabled the residents to have video calls with their loved ones. ... Aged care [organizations in] particular became a target [for cybersecurity attacks].... We were already ... improving our cybersecurity measures, and so [the pandemic] has helped to accelerate that [process]."*

ACC also faced strategic challenges at the onset of the crisis. For example, IT investment into a smart digital ecosystem was postponed because of the need to focus on developing health and safety compliance processes. Zack commented: "A whole lot of new initiatives ... have been delayed for the best part of a year [due to] the pandemic [because we are now] struggling [with] so many other competing priorities." He further mentioned that ACC recognized there was a need to integrate its systems to support the transition to remote services: "[We have] standalone systems that don't talk to anything else, and so integration of all of these ... is a big problem."

During the crisis, ACC appointed a new digital-savvy IT leader who brought new vision and increased the company's risk appetite for technology implementation and innovation. Zack pointed out that the newly hired leader planned to explore new partnerships: "We might [pull together] ... clinical data [from all aged care organizations, so we] can predict what leads to a fall and manage that before it happens. ... It's that sort of thing that we're hoping to unlock with the data [so we can] understand ... the leading indicators of something which we know leads to a significant negative change in somebody's life." According to Zack, in general, "COVID gave ... the opportunity for people in the organization to see how technology could be used to unlock things that they previously didn't [think were] possible."

In summary, ACC first prioritized exploitative digital capabilities and then pursued explorative capabilities for surviving and thriving in a crisis. Specifically, ACC scaled up and accelerated its exploitation of existing and new digital capabilities not only to survive but also to acquire new foundational digital capabilities that would enable it to explore new partnerships at an industry level for the post-COVID world. The

traffic light assessments of the five factors at Aged Care Co. at the start of and during the pandemic are shown in Table 5.

Actions Taken by Other Case Companies Pursuing the Survive and Thrive Crisis Response

Neil, director of Digital at Pacific West University, emphasized his organization's strong agility and innovation culture: "Innovations are recognized, promoted and celebrated. It's building a culture around true agility." He also mentioned that the university used the COVID-19 crisis as an opportunity to accelerate its digital capability development to enter new markets: "[During the pandemic, we] scaled up new online places, new products and new business models." He further elaborated on the university's decision to move to a high-performance management approach: "COVID has forced us into a high-performance zone to solve problems faster and in a more innovative way than we are used to."

Edward, chief data scientist at Consulting Alpha Co., mentioned how the company had reassessed its finances and human resources:

> *"The audit business was actually stronger and [there was] more [demand for] financial [advice]. [There were no changes or increased demand or complexity in] the other third of the business, [but] there was demand for some clients to help them with COVID and with the external environment, especially with technology-related services, [though] advisory services were viewed as discretionary by our clients. ... [As a consequence], all of our staff went to four days a week and a 20% reduction [in renumeration]. ... We also had a restructuring where we lost about 250 people due to reduced demand."*

Terry, chief information officer at Public Two Co., discussed the technology solutions for streamlining processes, optimizing infrastructure and improving staff access to cloud-based tools: "A good example was 'split tunneling' where we can optimize our network to allow cloud-based services to be accessed directly from people's homes. ... Split tunneling [allowed us] to have secure connections to the cloud services and back to their homes."

The Thrive and Drive Crisis Response

Infra Project Co.

Infra Project Co. (IPC) is one of the largest essential infrastructure service providers for the construction industries in Australia and New Zealand, with approximately 10,000 employees and AU$4.59 billion in annual revenue. IPC pursued the Thrive and Drive crisis response to the COVID-19 pandemic.

At the onset of the pandemic, IPC reassigned its surplus capacity in terms of staff time to extending its digital infrastructure, which included fine-tuning machine learning algorithms and investing in new digital capabilities to automate tasks formerly carried out by people. Sally, general manager of data science and analytics at IPC, mentioned:

> *"...a machine learning algorithm [is] going to help ... improve operational effectiveness for that particular project [and] work order management. [We needed to] improve work order management [by] clustering work requirements into different groups because [we were now getting people to work in the office on] different days. Before, we used to allocate by skill level and task, [but] now we have to allocate to make sure that we don't have too many people on site at the same time."*

She further elaborated that IT leaders encouraged digital innovation and growth in response to the crisis. For example, building structure assessments were now carried out by drones: "We've pretty much doubled our drone fleet in the last 12 months; we've gone from 20 drone pilots to 40 across Australia and New Zealand."

IPC was in a stable financial condition at the onset of the crisis, focusing on the long-term operation, maintenance and management of critical public and private assets and infrastructure, and on launching new internal services to support transformation in working environments and conditions (e.g., communicable disease working protocols). Sally commented: "We are fairly untouched ... because in the first year [of the pandemic] we merged two companies

Table 6: Assessment of the Five Factors at Infra Project Co.

People	Cultural	Technical	Managerial	Financial
🟡 Redeployed staff from areas affected by COVID-19 to support strategic initiatives (O)* 🟢 Leveraged existing health and safety processes in business continuity plan (O)	🟢 Continued to be market leader through innovation and automation, building on the company's existing data-driven decision-making culture (O)	🟢 Automated and innovated through deploying advanced predictive analytics and technologies (D) 🟢 Empowered employees to use analytics tools to identify opportunities for improvement (D)	🟢 Launched new internal services to support transformation in working environments and conditions (O) 🟢 Leadership encouraged digital innovation and growth (O)	🟡 Relatively stable financial position; even grew through listing the company on the stock exchange (O)

* Abbreviations: O for onset of the crisis (within the first six months) and D for during crisis (after the first six months)

[and] we have just gone out for IPO funding. ... And we already have systems and processes in place generally for health and safety."

During the crisis, IPC did some process automation, but focused also on process innovation. This included using advanced predictive analytics to identify opportunities for improvement. Sally elaborated:

> *"We use data all the time to understand what happened, but [we started] to use it to predict and prevent things [i.e.,] preventative maintenance [and] predictive maintenance. ... [We also used data as] a tool just to help everyone get better visibility [because] there's no whiteboard ... that you can do your work on. So, we've really become much more focused on [data] to help us manage workload and visibility of our work across ... my team [and] other teams ... we work with."*

In summary, at the start of the crisis IPC prioritized both exploitative and explorative digital capabilities for thriving and driving in a crisis. Later on, it prioritized exploration. Overall, focusing on both exploitative and explorative digital capability development, enabled IPC to leverage its dormant capabilities to not only build a more solid technical foundation but to explore new opportunities, innovations and markets. The traffic light assessments of the five factors at Infra Project Co. at the start of and during the pandemic are shown in Table 6.

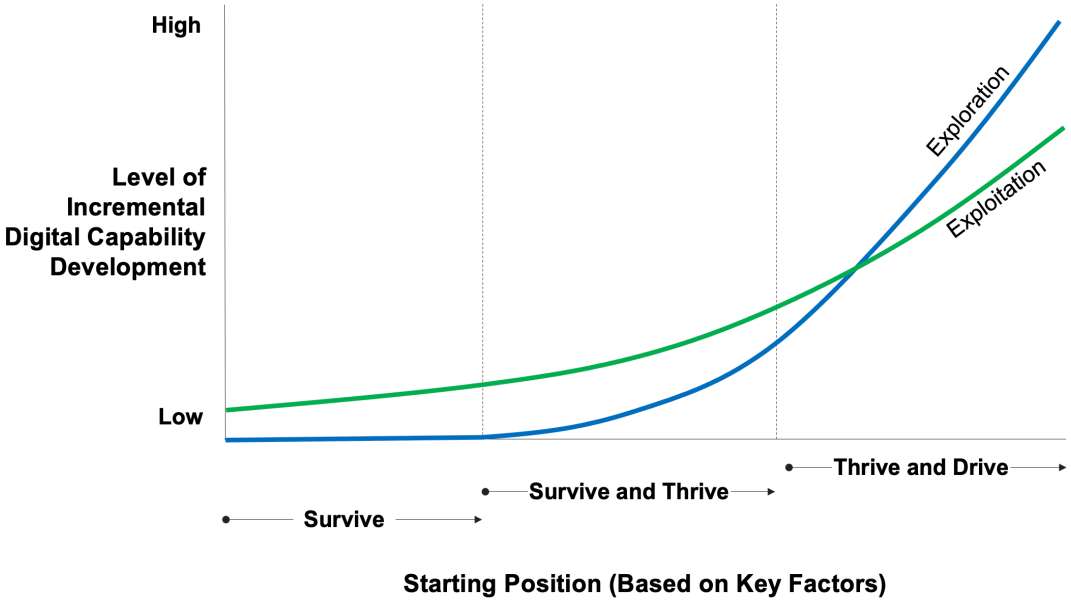
Actions Taken by Other Case Companies Pursuing the Thrive and Drive Crisis Response

Garry, vice president for data science and analytics at IT Tech Green Co., reflected on the new values of leadership and employee well-being:

> *"There is more change in leadership styles and ... communication approach. ... With people being locked up inside more and more, there is a lot of focus on ... mental health and making sure people are okay and they're not burning themselves [out]. There's a lot of focus on employee well-being, and we also have several other initiatives. .... [For example], we have a spring blossom [competition] like how many steps do you want to take?"*

Frank, head of IT architecture and engineering at IT Tech Blue Co., mentioned the company's financial initiative during the crisis: "We wanted to be recognized as a data monetization business. So, we [successfully launched] that new brand [and created a] new revenue stream in the market during the pandemic without any additional linkup." He further explained the context behind managerial decisions during the crisis:

Figure 1: Changes in Relative Prioritization of Exploration and Exploitation for Each Crisis Response



> *"We had to look for a solution and that's where innovation comes into. We started adopting new technologies [that] allow simultaneous whiteboarding and simultaneous collaboration. ... We need to put more focus on apps ... to move away from physical catalogs to digital catalogs. We've been thinking about [doing] this for a long, long time, but we had to fast track [this innovation] because of COVID-19."*

Frank also emphasized the role of technology in driving innovation in business models:

> *"We realized that [some] reports [were] no [longer] relevant or important for [the] business. [We needed to change so that the] workforce [did] something more strategic. Based on ... external observations ..., we started creating ... new use cases. [For example], we saw what was happening with toilet paper [panic buying] and [worked out how we could support] our partners ... by providing the analytics to [help them] make a better decision."*

How Prioritization of Exploitation and Exploration Change over Time

As illustrated by the cases described above, each of these crisis responses—Survive, Survive and Thrive, and Thrive and Drive¬—start by prioritizing either exploitation or exploration of digital capabilities, or both, but the prioritization changes during the crisis. The organizations in our study pursuing the Survive crisis response focused solely on exploitation. They were trying to make the most of what they had. As the crisis progressed, they scaled up their exploitation activities. Interestingly, because of the nature of their starting positions, these organizations did not pursue exploration to any notable extent.

Organizations that pursued the Survive and Thrive crisis response similarly prioritized exploitation at the start of the crisis, but subsequently engaged in some exploration activities. Depending on their starting positions, these organizations further developed both their exploitation and exploration activities as the crisis progressed. Organizations that pursued the Thrive and Drive crisis response concurrently

Table 7: Recommendations for Maximizing Value in Each Crisis Response

Survive	Survive and Thrive	Thrive and Drive
• **Exploit existing digital capabilities for maximum efficiency** (e.g., Healthcare Co. automated patient administration and admission using existing data analytics platform) • **Retire nonessential digital capabilities to free up resources** (e.g., Pacific East University halted in-house IT development for off-the-shelf digital solutions) • **Protect existing markets or maintain status quo through building/ solidifying foundational digital capabilities** (e.g., Pacific East University replicated its domestic digital communication infrastructure to retain student markets in China)	• **Exploit existing digital capabilities to maximum efficiency** (e.g., Pacific West University used existing IT infrastructure to support hybrid teaching modes) • **Repurpose underused digital capabilities** (e.g., Aged Care Co. repurposed Android tablets with Zoom, Skype and WhatsApp to support remote patient consultation) • **Deploy dormant digital capabilities to centralize and automate core activities** (e.g., Pacific West University developed and implemented an AI solution for COVID-19 vaccination registration) • **Develop foundational capabilities for exploration** (e.g., Aged Care Co. plans to access clinical data that will enable collaborative analytics for decision support)	• **Opportunistically explore and expand to new markets vacated by rival organizations** (e.g., IT Tech Blue Co. launched new advanced analytics services for existing clients) • **Nurture and incentivize an innovation culture to redesign business models for post-COVID sustained competitive advantage** (e.g., IT Tech Blue Co. adopted people-centered leadership for empowering employees to experiment with new advanced analytics services) **Solidify foundational capabilities to scale up both exploitation and exploration concurrently** (e.g., Infra Project Co. doubled its drone fleet and attached GoPro cameras to capture data for public maintenance projects)

prioritized exploitation and exploration at the start of the crisis. Interestingly, during the crisis, their emphasis shifted more toward exploration, but remained focused on both.

Figure 1 provides a pictorial representation of these prioritization patterns. The three crisis responses are positioned on the horizontal axis according to their different starting positions and their initial and subsequent digital capability development over time. The vertical axis indicates the level of incremental digital capability development throughout the crisis over and above that which existed pre-crisis, and thus portrays changes over time in the prioritization of exploitation and exploration, or both. For example, as indicated in the figure, for organizations pursuing the Survive crisis response, we saw no incremental explorative digital capability development during the crisis.

Figure 1 also depicts both the sequential and concurrent prioritization of exploration and exploitation for the Survive and Thrive and Thrive and Drive crisis responses. At the start of a crisis, there is no explorative capability development in the Survive and Thrive response but, as indicated, these activities kick in sequentially as the crisis progresses. Organizations pursuing the Thrive and Drive crisis response prioritize both exploitative and explorative capability development concurrently, initially with a slightly greater focus on exploitation, but the priorities switch over time.

Note that the upwards trajectories depicted in Figure 1 follow from the fact that all organizations in our study scaled up either or both their exploitation and exploration digital capability development to some extent as the crisis progressed.

Recommendations for Maximizing Value During a Crisis and Preparing for the Next One

Based on our findings from the 18 case studies, we provide the following two recommendations for IT leaders. The first concerns maximizing value in each type of crisis response (with the response pursued being determined by a specific organization's starting position at the start of a crisis). The second concerns how best to position the organization for the next crisis.

1. How to Maximize Value in Each Crisis Response

Organizations pursuing the Survive crisis response exploit existing digital capabilities to their maximum efficiency and thus focus on automation and redeploying existing capabilities. Depending on its financial position, this response should see an organization through the crisis. All organizations in our study, regardless of their crisis responses, engaged in exploiting existing digital capabilities.

The same applies in terms of survival for organizations pursuing the Survive and Thrive crisis response, but they should also undertake some subsequent exploration activities to help them thrive post-crisis. The key for such organizations is to also develop at least some foundational capabilities for exploring new digital capabilities. Initially prioritizing exploitation and then switching to a greater focus on exploration is a plausible strategy for most organizations. Based on our empirical evidence, we strongly advise against first prioritizing explorative digital capability development, unless your organization is in a very sound financial position, has an appetite for risk and an extensive digital infrastructure that will enable innovation to be prioritized.

Maximizing value in the Thrive and Drive crisis response comes from aggressively exploring opportunities driven by digital capability developments (e.g., targeting potentially emerging market opportunities). Organizations pursuing this response should focus on continued innovation, redesign of business models and further concurrent scaling up of both explorative and exploitative digital capability development to take advantage of opportunities vacated by rivals. Our recommendations for maximizing value in each type of crisis response are shown in Table 7.

In conclusion, organizations might be expected both to exploit and explore digital capability development in normal times to some extent. In a crisis, however, the initial priority is exploitation to survive the immediate existential threat. It is only when the immediate threat has been mitigated that attention shifts to exploration. This was true for all organizations in our study, even those that pursued the Thrive and Drive crisis response.

2. How to Position the Organization for Thriving and Driving in the Next Crisis

IT leaders need to prepare their organizations for the next crisis. Focusing only on survival in the long term will be suboptimal for most organizations even though they survived the COVID crisis. Instead, organizations should progress through the crisis responses, from Survive, to Survive and Thrive and finally to Thrive and Drive, improving their digital capability development as they do so. Our recommendations for making this progression are listed in Table 8, categorized under the five key factors identified earlier in this article.

As indicated in Table 8, breaking free from the Survive crisis response hinges on the ability to free up financial resources to pursue future exploration. This includes upskilling staff for exploration while ensuring the retention of key talent for continued exploitation. To progress from the Survive and Thrive to the Thrive and Drive crisis response requires new investment to divert resources toward even more exploration. This includes recruiting technology leaders who can drive explorative capability development. Finally, progression to the Thrive and Drive crisis response requires deepening the organization's digital capability development, with a dual focus on exploitation and exploration, with the latter increasingly coming to the fore. Future growth when pursuing the Thrive and Drive crisis response demands entrepreneurial thinking and technology-based investment to build on existing momentum.

Table 8. Recommendations for Improving Crisis Response

Survive → Survive & Thrive	Survive & Thrive → Thrive & Drive	→ Thrive and Drive
People • **Break the survival mindset** (e.g., reassure employees about employment and encourage innovative thinking) • **Retain key staff essential for post-crisis business continuity** (e.g., provide competitive incentives and recognition for key IT staff) • **Upskill to pursue future exploration** (e.g., train IT staff in the development of scalable IT infrastructure) **Cultural** • **Encourage innovation attitude and behavior amongst staff to experiment on small scale** (e.g., provide incentives for prototyping new scalable IT solutions) **Technical** • **Enhance process efficiency** (e.g., automate manual and repetitive tasks using robotic process automation) **Managerial** • **Recruit technology leaders with automation and process management expertise** (e.g., hire a tech-savvy CIO with a passion for process automation) • **Simplify and standardize shared services** (e.g., implement an administrative partnership model) • **Pilot scalable process automation** (e.g., launch intelligent operations initiative) **Financial** **Liberate financial resources to support future exploration** (e.g., outsource nonvalue tasks and processes)	**People** • **Target talent recruitment for new skillsets to support more exploration** (e.g., create skilled IT teams for development of scalable IT solutions) **Cultural** • **Garner and incentivize an innovation mindset** (e.g., implement a reward scheme for innovative thinking) • **Build on crisis innovation impetus** (e.g., increase investments in emerging AI technologies) **Technical** • **Acquire systems and technology to enable more exploration** (e.g., implement collaborative platforms to support brainstorming processes) **Managerial** • **Recruit technology leaders focused on exploration and innovation** (e.g., hire a tech-savvy CIO and enter new geographical markets through digital transformation) • **Develop modular process structure to support crisis business models** (e.g., build intelligent stackable processes for flexible manufacturing or sourcing) **Financial** • **Provide new investment and divert excess financial resources for more exploration** (e.g., reinvest profits in emerging AI technologies)	**People** • **Target aggressive recruitment for both exploitation and exploration** (e.g., hire skilled IT teams for rapid new product/service prototyping) **Cultural** • **Encourage entrepreneurial thinking, calculated risk-taking, and acceptance of occasional failure** (e.g., build a conscious, continuous organization-wide commitment to risk-taking and engagement with radical, creative ideas) **Technical** • **Invest in technology R&D, including experimenting with emerging technologies** (e.g., pilot a blockchain product/service in a well-established market) • **Pioneer market-leading digital platforms for market expansion** (e.g., prototype an AI service-oriented platform to enter new geographical markets) **Managerial** • **Adopt entrepreneurial thinking in technology investment** (e.g., accepting failure with investments in emerging technologies) • **Invest in intelligent and adaptive process design** (e.g., invest in integrating human and machine intelligence to deliver process modularity) **Financial** • **Continue to reinvest financial resources for opportunistic growth** (e.g., reinvest profits in entrepreneurial growth initiatives)

Concluding Comments

This study shows how IT leaders should prioritize their digital capability development (exploitative or explorative) during a crisis. They should first assess their organization's starting position at the onset of the crisis, which is determined by assessing five key factors: people, cultural, technical, managerial and financial. The starting position largely determines which of three distinct crisis responses the organization should pursue—Survive, Survive and Thrive, and Thrive and Drive. Each of these responses initially prioritizes exploitation or exploration, or both, with shifts in emphasis during the crisis. IT leaders can draw on the experiences of the organizations in this study to calibrate their own specific starting positions and inform their digital capability development in times of crisis.

Appendix: Research Method

Data Collection

Our primary data source was two rounds of in-depth semi-structured interviews with IT managers and executives in 18 Australian organizations from eight different industries. (To preserve their anonymity, the organizations and interviewees are referred to by pseudonyms.) In the first round (October 2020 to March 2021), we conducted 21 online interviews and, in the second round, we conducted six online follow-up interviews during the period of October to December 2021. The interviewees were directly involved in the organizational response to the COVID-19 crisis, and the wide variety of industries enabled us to capture rich insights about organizations' digital capability development in a crisis. Table 9 provides details of the 18 organizations and the interviewees.

The total duration of the formal interviews was approximately 24 hours. The interview notes resulted in an additional 10.5 pages of supplementary notes. In addition to this primary data, we collected secondary data from 18 official company webpages, five internal documents on business continuity planning, 12 news reports about the selected organizations' actions to manage the COVID-19 crisis, and 4.5 hours of publicly available podcasts on organizational management and transformation during the crisis. The secondary data was integrated and triangulated with the primary data to create rich case narratives. Collectively, all this information provided an in-depth understanding of organizations' digital capability development in a crisis. The table below lists our primary and secondary data sources for this study.

Data Analysis

Data analysis was conducted in two rounds.[9] First, we developed an in-depth understanding of the organizational actions for digital capability development in a crisis and thus each organization was treated as a separate case study. Next, we identified similarities and differences across all industries in terms of the organizations' actions for digital capability development in a crisis by highlighting emerging patterns.

In both rounds, we used the thematic template analysis technique,[10] which begins by developing a coding template based on literature for ambidexterity and digital capability. These a priori codes[11] acted as sensitizing concepts and guiding themes for the initial data analysis.[12] The codes also served as points of reference for comparing the emerging findings with existing theory.[13] Using the initial coding template, the interview data was analyzed together with the supplementary interview notes. In the first stage, codes were also allowed to naturally emerge from the data (i.e., grounded theory coding), and constantly modified based on their usefulness and suitability, resulting in the modification of several themes. We also used the secondary data to triangulate and refine the main coding themes.

The final coding template consisted of six main themes related to: 1) digital capability for exploitation; 2) digital capability for exploration; 3) digital capability development over time; 4) digital capability prioritization; 5) the five factors to be considered for digital capability

9 Miles, M. B. and Huberman, A. M. *Qualitative Data Analysis: An Expanded Sourcebook*, SAGE Publications, 1994.

10 King, N. "Template analysis," in *Qualitative Methods and Analysis in Organizational Research: A Practical Guide*, eds. Symon, G. and Cassel, C., SAGE Publications, 1998, pp. 118-134.

11 Codes that are developed before examining the current data.

12 Bowen, G. A. "Grounded Theory and Sensitizing Concepts," *International Journal of Qualitative Methods* (5:3), November 2005, pp. 12-23.

13 Eisenhardt, K. M. and Graebner, M. E. "Theory Building from Cases: Opportunities and Challenges," *Academy of Management Journal* (50:1), February 2007, pp. 25-32.

Table 9. Demographics for Case Organizations and Informants

Case Organizations and Interviewees	Industry/ Sector	Organization Size	Interviewees	Years in Role	Crisis Response
Healthcare Co.	Healthcare	Private corporation with 10,000+ employees	Andrew (A), Chief information officer	5	Survive
			Ben (B), Director of IT solutions planning and design	4	
Infra Project Co.	Construction	Private corporation with 10,000+ employees	Sally (S), General manager of data science and analytics,	2	Thrive and Drive
IT Tech Red Co.	IT services	International corporation with 310,000+ employees	Danny (D), Solutions director for SQL services,	2	Survive
Consulting Alpha Co.	Consulting services	International corporation with 170,000+ employees	Edward (E), Chief data scientist	7	Survive and Thrive
IT Tech Blue Co.	IT services	Private company with 500+ employees	Frank (F), Head of IT architecture and engineering	8	Thrive and Drive
IT Tech Green Co.	IT services	Publicly traded multinational corporation with 135,000+ employees	Garry (G), Vice president for data science and analytics	3	Thrive and Drive
Consulting Beta Co.	Consulting services	Multinational corporation with 7,000+ employees	Harry (H), Director of data and AI platforms/ solutions	5	Survive and Thrive
IT Tech Black Co.	IT services	Private international corporation with 500+ employees	Ivan (I), General manager of IT	5	Survive
Consulting Gamma Co.	Consulting services	Private company with 50+ employees	Jack (J), Chief executive officer	10	Survive
IT Tech Brown Co.	IT services	Private international corporation with 500+ employees	Kane (K), Head of professional IT services	7	Survive
			Mike (M), Chief technology officer	2	
Pacific West University	Tertiary education	Public corporation with 18,000+ employees	Neil (N), Director of digital	2	Survive and Thrive
Pacific East University	Tertiary education	Public corporation with 5,000+ employees	Oliver (O), Deputy chief digital officer	1	Survive
			Peter (P), Chief digital officer	8	
IT Tech Yellow Co.	IT services	Private international corporation with 5,000+ employees	Quan (Q), Digital innovation lead	1	Survive
Rich Bank Co.	Banking services	Publicly traded multinational corporation with 10,001+ employees	Robert (R), Technology lead for banking services	5	Survive and Thrive

Table 9 (Continuation). Demographics for Case Organizations and Informants

Case Organizations and Interviewees	Industry/ Sector	Organization Size	Interviewees	Years in Role	Crisis Response
Aged Care Co.	Aged care	Not-for-profit company with 5,000+ employees	Zack (Z), Head of IT operations	2	Survive and Thrive
Public Two Co.	Government	Government agency with 5,000+ employees	Terry (T), Chief information officer	8	Survive and Thrive
Big Charity Co.	NGO	Non-governmental organization with 1,000+ employees	Uren (U), Head of IT operations	8	Survive and Thrive

Table 10. Primary and Secondary Data Sources

Data Source	Interviewees																				TOTAL
	A	B	S	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	Z	T	U	
In-depth Interviews	1.15 hrs	1 hr 40 mins	1 hr 30 mins	1 hr	1 hr	1 hr	1 hr 45 mins	45 mins	1.05 hrs	1 hr	55 mins	45 mins	55 mins	1 hr 45 mins	1.05 hrs 30 mins	45 mins	45 mins	55 mins	1.05 hr 40 mins	1 hr	55 mins	~24 hours
Interview Notes	0.5 pg	0.5 pg	0.5 pg	0.5 pg	0.5 pg	0.5 pg	0.5 pg	0.5 pg	0.5 pg	0.5 pg	0.5 pg	0.5 pg	0.5 pg	0.5 pg	0.5 pg	0.5 pg	0.5 pg	0.5 pg	0.5 pg	0.5 pg	0.5 pg	~10.5 pages
Secondary Data	18 x official company websites																				21 websites
	5 x internal company documents																				5 business continuity plans
	12 x news reports about the selected organizations dealing with the COVID-19 crisis																				12 news reports
	5 x publicly available podcasts about organizational management and transformation during the COVID-19 crisis*																				~4.5 hours

*The publicly available podcasts can be accessed at:
1) https://www.act.ipaa.org.au/workwithpurpose
2) https://www.act.ipaa.org.au/wwp_40
3) https://www.act.ipaa.org.au/wwp_anniversaryedition
4) https://www.act.ipaa.org.au/wwp_37
5) https://www.act.ipaa.org.au/wwp_36
6) https://www.act.ipaa.org.au/wwp_34
7) https://www.act.ipaa.org.au/wwp_3

development; and 6) type of crisis response. The outcomes of the two rounds of data analysis were conceptualizations of:

- The three organizational responses to crisis—Survive, Survive and Thrive, and Thrive and Drive
- The five key factors for digital capability development—people, cultural, technical, managerial and financial
- The way in which digital capability development evolves over time from the start of a crisis (i.e., the organization's starting position and the prioritization of exploitative and explorative digital capability development). All data was coded, analyzed and visualized using the NVivo 11 qualitative data analysis package. The final coding scheme of the two rounds of data analysis is shown in table 11.

Table 11. Final Coding Scheme

Ambidexterity (prior node)[14]	**Considerations for digital capability development (emerging node)**
Exploitation (refinement, choice, production, efficiency, selection, implementation execution)	People (digital skills and knowledge)
Exploration (search, variation, risk taking, experimentation, play, flexibility, discovery, innovation)	Culture (values and norms)
Digital capability (prior node)[15]	Technical (systems and infrastructure)
IT skills	Managerial (leadership, processes, procedures and policies)
Information management capability	Financial (liquid assets and investments)
Data analytics capability	**Organization's response to a crisis (emerging node)**
Synergistic capability	Survive (repurpose and absorb)
Strategic capability	Survive and Thrive (adapt and scale up)
	Thrive and Drive (reconfigure and deploy current and dormant capability)
	Digital capability development over time (emerging node)
	Prioritization (exploitation vs. exploration)
	Starting position (based on organization's response to crisis)

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