Business School

The University Of Queensland
AUSTRALIA

CREATE CHANGE

DIGITAL SERVICE TRANSFORMATION

Pathways to human and economic wellbeing

White Paper

Contents

Foreword

Professor Janet McColl-Kennedy

Associate Professor Christoph Breidbach

Seventy per cent of Australia's gross domestic product (GDP) stems from services, and four out of five Australians are employed by the service sector. While services have always relied on the use of Information Technologies (IT) to varying extents, the COVID-19 pandemic significantly increased the speed and trajectory of digital transformation in the service sector. To remain competitive in a post-pandemic global economy, Australian service firms need to refine existing customer experiences, create service innovations, all while simultaneously managing their workforce throughout the 'new normal' imposed on them by COVID-19 and emerging digital technologies.

While IT has been critical for many services, existing academic research investigating the intersection of IT and service has not provided insights on how new smart technologies can advance service and did not provide the kind of insights that could advance managerial practice and academic scholarship alike. Therefore, new scientific approaches are needed to develop theoretically and managerially relevant knowledge about the digital transformation of service. To do this, the Service Innovation Alliance Research Hub at The University of Queensland (UQ) Business School applied a 'use-inspired' research philosophy, designed to address real-world phenomena, such as the digital transformation of service, by initially identifying grand challenges associated with the phenomenon, before developing solutions jointly with those affected by the challenges. Importantly, 'use-inspired' research induces a shift from discovery oriented 'basic' research, which focuses on pure knowledge creation, to one where research is aligned with specific socioeconomic needs or managerial challenges – such as the digital transformation of services.

This White Paper is the result of a roundtable we held in Brisbane in November 2022, which brought together 64 participants – industry representatives from financial services, health services, construction, consulting, tourism, and government, with an interdisciplinary group of academics. We jointly identified, articulated, and ranked managerial challenges and opportunities stemming from the grand challenges associated with digital transformation of service. Each team addressed a unique 'service need', with the academics providing scholarly expertise and the industry partners providing important real-world insights. The digital service transformation catalogue we put forward represents urgent service opportunities and challenges to be addressed, as well as practical guidelines on how to approach the complex intersection of digital transformation and service.

Professor Janet McColl-Kennedy
Associate Professor Christoph Breidbach
Co-Leads, UQ Business School Service Innovation Alliance Research Hub

Acknowledgement of Country

The UQ Business School acknowledges the Traditional Owners and their custodianship of the lands on which we meet. We pay our respects to their Ancestors and their descendants, who continue cultural and spiritual connections to Country. We recognise their valuable contributions to Australian and global society.

UQ Service Innovation Alliance **Research Hub**

The UQ Service Innovation Alliance (SIA) Research Hub brings together experts from six different disciplines (business information systems; international business; marketing; strategy and entrepreneurship; tourism; and management) within UQ Business School, industry partners across multiple service sectors, as well as international collaborators to address key challenges service businesses face.

The SIA conducts research in customer experience, service workers and sustainable innovation to improve productivity; to train and manage workforces; to measure and manage customer experience; and explore new ideas to successfully introduce new technologies. A particular focus of SIA across all pillars is digital transformation.

As one of the world's leading service innovation research groups, SIA offers a 'one stop shop' for research and training – encouraging debate, providing insights, educating leaders and informing the future of service organisations.

Researchers are internationally recognised in the following three areas of excellence:

- **Customer experience:** the research investigates customer needs and preferences, emerging markets, co-creation and design of experiences and new measurements tools. It also has an important focus on digital technology trends, including customer responses to digital technologies including for example service robots and chatbots and other artificial intelligence (AI) enabled actors, as well as privacy and ethical issues.
- **Service workers:** the research focuses on understanding future labour market challenges, such as future workforce skills and the impacts of automation, mobile technologies and self-service technology, productivity and emerging changes in employee–organisational relationships.
- **Sustainable service innovation:** how can service systems be designed sustainably? How can sustainable service outcomes be measured? How do digital technologies facilitate this process? We collaborate with industry partners to 'set the agenda' for sustainable service innovation research, observe how 'everything-as-a-service' technology strategies make service firms more resilient to changes in the turbulent environment, and provide guidance on how customers may be included in such service settings.

UQ Business School is a world leader in service research. With a strong team of academics actively engaged in services projects, few institutions can rival the breadth of our work.

The SIA aligns with UQ's research strengths in healthy ageing, technology for tomorrow, and transforming societies. We work with a broad scope of government and industry partners, including visitor attractions, hotels, resorts and service providers worldwide.

Our mission

Co-create transformative solutions with impact by undertaking innovative, timely, high-quality research and training that informs the future of service organisations, translating research findings to practice.

Our vision

Be the leading inter-disciplinary service innovation hub in the Asia-Pacific and within the top three in the world by 2025.

Why **SIA research?**

The SIA Research Hub helps service organisations to improve productivity, train and manage their workforce, measure and manage customer experience, explore new ideas and successfully introduce new technologies. The research theme is underpinned by three interconnected areas of focus; customer experience, service workforce and service innovation. This helps service organisations to understand and implement technology trends, including how customers respond to robots and using big data to personalise their services.

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16 PhD students
4 Post-Docs

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For more information on SIA research Hub visit:
business.uq.edu.au/service-innovation-alliance

PART 1

Digital service transformation is critical to human and economic wellbeing

Maintaining humanness in the age of digitalisation

Theme Leads: Janet McColl-Kennedy and Tor W. Andreassen
Panel of Experts: Brent Ritchie, Sandra Pavey, Grant Statton, Len Coote, Edgar Brea, Teegan Green, Anne-Maree O'Rourke, Felix Septianto, David Goyeneche

Digital technologies are changing the way we live, love, work and entertain ourselves. Retailers are using these digital technologies to predict our shopping behaviour and preferences. Dating apps are using artificial intelligence (AI) and machine learning (ML) to select potential partners for us. TESLA is using AI for autonomous driving. Software companies such as OpenAI are developing software to write text for us. Rogue actors are using these digital technologies to persuade us with Twitter bots and fake news. Companies are using AI/ML to hire us – or not!

This is just the beginning. As AI becomes smarter and more humanlike, our societies and economies will undergo the most dramatic changes we have seen since the agricultural revolution. Some of these changes have the potential to enhance our lives,[1] while others may dehumanise experiences and lead us to behave in more machine-like ways in our interactions with others. It's up to humanity to adapt and determine how we want to live and work. Despite increasing levels of automation enabled by AI, it is critical to maintain humanness.[2] Indeed, AI's long-term success is contingent upon ensuring that people are central in its design, operation, and use and the criticality of drafting and monitoring the rules of engagement.[3] The rapidly emerging interest in human-centred AI is based on several design goals, including being ethical, explainable, interpretable, predictable, responsible, robust, transparent, trustworthy, and unbiased.[4]

Advocates of human-centred AI promote human values such as rights, justice and dignity. They seek to design, implement and disseminate super-tools that support human self-efficacy, creativity, responsibility and social connections. These super-tools need to be reliable and trustworthy systems even in the face of threats from malicious actors, biased data and flawed software. Thoughtful design strategies can deliver both high levels of human control and high levels of automation, as they do already in digital cameras, navigation tools, robotic surgery and much more. The future will be shaped by those who support human autonomy, wellbeing and control over emerging technologies. It is safe to predict that the future is human-centred; yet, how we maintain that humanness is key. We now address in more detail the issue of maintaining humanness in the digital age by discussing key related challenges and opportunities, before outlining recommendations for the future.

What are the challenges?

Adhering to the core value that 'human + AI/ML' is better than either one individually, we can develop novel user experiences and visualisations that foster effective human–AI collaborations. We can also create frameworks for designing and evaluating human–AI interaction models and conducting research that develops and extends human–AI collaboration or co-creation theories.

We can address workplace-related humanness as a digital age issue along two dimensions – (1) cognitive and analytical capabilities and (2) the ability to express emotions, empathy and relational capabilities towards other humans (Figure 1).

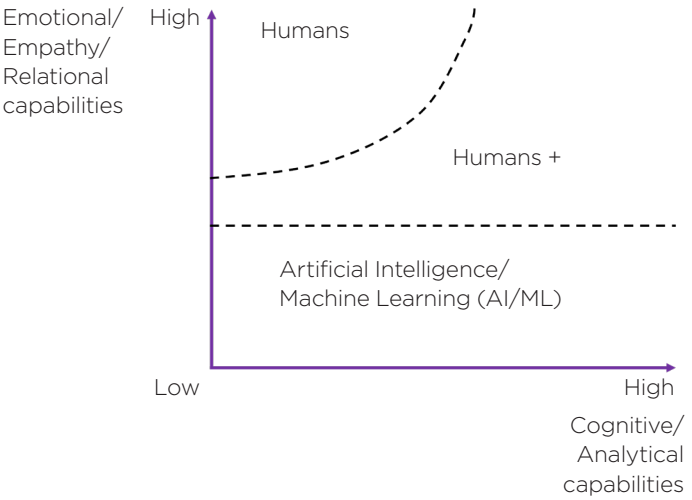

Figure 1. Who does what best? Source: Andreassen

Figure 1 illustrates how humans have an advantage in the latter category and a disadvantage in the former category. As the power of AI/ML advances, we must recognise that AI will be able to not only respond to emotions in a human's voice and facial expressions but also to express emotions, and possibly even authentically 'feel' emotions, decreasing the 'human-only space'. This is what Rust and Huang define as the ultimate drive toward the "emotional economy".[5] While technology and AI/ML may replace human tasks and jobs, the preferred scenario is enhanced human performance by cooperating with AI, either in upstream functions (such as in the design and production of a service) or in downstream functions (such as in service delivery or in service recovery when a service fails).

The first is related to employing AI to replace people – that is, cost cutting – which means doing the same things as we always have done, but with less human input. A more human approach to AI in organisations would be to address the other side of value creation, by asking: 'How can we use AI to innovate and create new goods and services and business models that we could not do before?'

We argue that the real benefits of AI/ML lie in downstream activities and functions centred around the customer. Co-creating value with customers and providing them with more convenient and more pleasurable, rewarding experiences is well-aligned with humanness. But this will require 'out-of-the-box' thinking and being innovative. According to Gourville,[6] the more companies change how products work, the more behaviour changes are demanded from consumers. While companies can create value through product changes, they can capture it most easily through personalisation, minimising the need for consumers to change. AI/ML that delivers minimal change and maximal value can provide organisations with 'smash hits', as the technology can deliver on both dimensions simultaneously through personalisation. For example, the music-streaming service Spotify and the movie-and-television-streaming service Netflix have an abundance of customer data that enables them to train their AI/ML algorithms to tailor recommendations (i.e. increased value) in a very intuitive and user-friendly manner (i.e. no change in behaviour). It goes without saying that both are smash hits with customers.

We predict that organisations with an ingrained customer focus – a humanness perspective – will have a distinct advantage in the marketplace. Furthermore, we also predict that AI will not replace organisations, but rather that organisations that use AI will replace organisations that do not.

What are the opportunities?

AI can empower. Grant Statton, CEO Innovation and Energy, FKG Group, pointed to the importance of being open to technology playing an integral role in consumers' everyday life and enhancing the customer experience: "Think of smart cities where technologies can reduce the need for energy or solve problems such as traffic congestion by providing optimum travel routes without the consumer even knowing". Because people worldwide are living longer – according to the World Health Organization, one in 6 people in the world will be aged 60 years or over by 2030[7] – there is an increased demand for (smarter) healthcare services. AI-based smart homes and service robots can increase productivity, decrease the impact on health institutions, and reduce the feeling of loneliness that can come with such changes.

For consumers to benefit from AI, they must feel confident and motivated to adopt AI-based services or business models in their lives, which begs the question: 'How does AI empower consumers?' One approach is to consider Christensen et

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>
> **Grant Statton, CEO Innovation and Energy, KFG Group**

Pictured left to right: Dr Felix Septianto, David Goyeneche, Prof. Janet McColl-Kennedy, Grant Statton and Assoc. Prof. Len Coote

al.'s theory of "jobs to be done".[8] The authors claim that the right unit of analysis is not the customer but the job they wish to get done. The theory posits that people do not buy products or services; they 'hire' individuals (or even machines) to do jobs, such as solving a problem or fulfilling a desire. To assist providers in better understanding how to empower consumers, we need to identify what the problem is, what the value proposition is, and how including AI/ML in the service may benefit consumers. Providers need to recognise the power of AI/ML to customise all aspects of value creation, value delivery, value communication and value capturing for individual consumers. That is, how to nudge consumers to act in the organisation's best interest rather than necessarily in their best interest. This leads to the question of how to empower consumers to push back to the industry.

Firstly, good data and resources are needed. Dr Sandra Pavey, Health and Wellbeing Queensland (HWQld), shared examples from her experience of targeting childhood obesity and of the need to provide advertising and marketing around healthier alternatives in schools, and potentially in earlier settings: "We want to encourage children to move more. Perhaps an app could help them make better health-related decisions – especially decisions concerning balancing short-term utility with long-term benefits (for example healthy living, eating, drinking, and even saving money for the future versus spending today). Social media is a platform targeting youth. We need to focus more on education and encouraging healthy communication. Focus on different socioeconomic areas. We need data and resources to create change." Dr Teegan Green highlighted a related example of food choices for children in traditional retail stores (physical outlets) versus online (app shopping) and the need to consider the 'digital diet' as much as the 'actual' diet that children consume. She observed that we need to consider other social media platforms where children and young people are engaged and consuming online content: "TikTok, digital nudges from technology, and controlling push notifications can influence food choices. Fundamentally, all consumers need to be able to trust that the supplier uses AI in a way to serve both parties' long-term interests. Trust is key."

Indeed, trust in how data is collected, stored, shared, and used for optimisation, predictions, decisions, and innovations is vital. As Grant Statton pointed out, "in an AI world, firms and government actors are trying to convince people to rely more on AI and trust them as well-meaning actors. But farmers, for example, often do not have any idea about the data they share, but they are happy when there are positive outcomes." Consumers' trust and transparency are big issues with AI in general and specifically AI+ML that leads to self-coding algorithms. In other words, AI/ML will lead to black boxes where leaders will over time lose the ability to explain decisions, predictions or outcomes made by algorithms. Thus, a key question that needs to be asked is: 'Does ML-based coding maximise customers' interests or the providers' interests'? for example, the algorithms used in YouTube, Snapchat, Facebook and Netflix are designed to optimise content in ways that keep the user engaged. In his book The chaos machine: The inside story of how social media rewired our minds and our world, author Max Fisher points to several examples where these AI/ML-driven social media platforms have contributed to the polarisation and destabilisation of societies.[9] Therefore, it will be important to determine how the needs of actors behind the technology are regulated to act in the best interest of society, consumers and employees in keeping with the triple bottom line: profit, people and the planet. The European Union (EU) is taking a lead here in regulating actors and their respective technology.[10]

Navigating through the wide array of digital technologies can be difficult for customers due to their unfamiliarity with technology. The dehumanisation of interactions with technology can create frustration for consumers or fear about what the organisation might be able to do with the data derived from the new digital technology. One option could be for customers to consider having a digital twin. These are valid arguments when consumers adopt new AI/ML-driven services. But can one's digital twin be trusted to act in the best interests of the individual?

From a health perspective, many helpful applications can be envisaged. Areas related to a healthcare consumer's health can be updated and used to continuously predict things that are important to individual customers. But customers might be concerned about how much digital technology is dictating their choices and experiences. There is a strong need to get the balance right between the machine telling the customer what to do and the customer taking some risk by experiencing the service and making choices that are important to them. Where is the fun in a machine telling you what you can and cannot do?

It's important to carefully consider the role(s) of a digital twin. As Associate Professor Len Coote asked, should a digital twin be an advocate, a buddy, a parent or a boss? There can be clear advantages to the customer if the digital twin's role is a buddy. For example, they could undertake some of the work for an individual, enabling them to have more free time to spend with their family and friends or engaging in a hobby or sporting activity. Or the digital twin could 'nudge' the customer to stop eating too much chocolate or sitting on the couch for too long. But what if the digital twin is a 'fake buddy', providing nudges that do not really benefit the customer?

Notwithstanding the potential benefit that digital twins may be able to offer to customers, it is important to also acknowledge that customers want autonomy. As Professor Brent Ritchie noted, customers could benefit from technology providing recommendations on what to purchase or not purchase, and where to go or not go for holidays, and what to do while on holiday. However, there is a fine line between being overly prescriptive and allowing consumers to be free to make their own decisions by weighing up the costs and benefits given through the information sourced and collated by the technology. As data becomes more and more connected, a step change will come, which should enable better choices to be made by both consumers and organisations as nuanced tastes and preferences are likely to be well understood. Opportunities lie in understanding the connectedness of AI and the potential for cross-over and interoperability of apps, for example. Dr Felix Septianto stressed the importance of deeply understanding (1) what matters; (2) when it matters; and (3) where it matters. By addressing these questions, consumers and organisations should be able to make assessments about how to appropriately adopt AI in different contexts.

"Social media is a platform targeting youth. We need to focus more on education and encouraging healthy communication. Focus on different socioeconomic areas. We need data and resources to create change."

Dr Sandra Pavey, Health and Wellbeing Queensland

Recommendations for policy and practice

Maintaining humanness in the age of digitalisation is a topic that pervades all aspects of our personal and work lives. Both customers and organisations need to carefully investigate five key areas to maximise benefits.

1

Determine who benefits from AI.

Is it the firm or the customer, or can it be both parties? Be specific in identifying the particular benefits for each of the respective parties.

2

Identify the roles that digital twins can and should perform.

Be clear about what the various roles are. For example, is the digital twin a 'buddy, a 'parent' or a 'boss'/'supervisor'? Do they have a filter, and are they tuneable?

3

Articulate in which contexts digital twins can be employed.

When should the digital twin be used? Where are we currently using it? Is it a type of collective intelligence, and importantly determine how is value being co-created?

4

Trust in digital is critical.

Care needs to be exercised to determine the authenticity and integrity of the digital twin (as well as other forms of AI).

5

Determine on what basis decisions are being made.

How much input does the customer have, or should they have, in decisions? The bottom line is that we need insight into the black box and customers need some level of autonomy, perhaps some more than others.

Evaluating the impacts of technology on employee wellbeing

Theme Leads: David Solnet and Richard Robinson
Panel of Experts: Brett Kapernick, Daniel Gschwind, Amanda Smith, Anshu Sisodia, Keith Burchill, Hongmin Yan, and James Tarbit

Post-COVID, a new and unsettling challenge has emerged that is affecting nearly all sectors of the economy: a lack of available labour and a deficit in the necessary skills to operate businesses. While we will hitherto refer to this as 'labour and skills shortages', they are not the same thing; nevertheless, both imply a situation where employers are unable to fill or have considerable difficulty in filling vacancies for an occupation, at current levels of remuneration and conditions of employment and reasonably accessible locations.[11] This section of the white paper considers labour and skills in a service industry context. In particular, it responds to the labour and skills crisis that began in early 2020 with the COVID-19 pandemic impacts, and the subsequent labour shortages that have characterised most of developed economies. An employee-centric approach is adopted.

What are the challenges?

According to the Organisation for Economic Co-operation and Development (OECD), Australia has the second-worst labour shortage in the developed world.[12] Service organisations have been particularly hard hit, with a myriad of examples worldwide evidencing the significant impacts on organisational performance due to the lack of available workers with requisite skills. Statistics bear out the extent of this problem across many sectors and occupations, with regional areas generally faring worse. For example, in 2022 the National Skills Commission reported that 286 occupations were negotiating worker shortfalls nationally, compared to 153 occupations in 2021 – 5 of the top 10 occupations were in the service industries.[13] Similarly, 85 per cent of Australian businesses reported skills and labour challenges in 2022.[14] Adding further complexity is the nature of the service sector, with a significant proportion of businesses being micro or SMEs, often with limited resources and capacity to enact new programs or organisational change.

Labour and skills shortages create many negative impacts. For organisations, this includes reduced hours of operation, lower service standards, longer customer wait times, excessive overtime costs, unfilled positions and lost productivity. Impacts not only harm organisations but also those in the remaining workforce – an issue which has received far less attention by academics and practitioners. The primary focus on this topic in popular media and academic research has been on the macro-economic and organisational levels, measured in reduced revenues and unrealised profits. Neglected in the current narrative is the impact on employees, which is the focus of this section. The wellbeing of frontline employees has been a topic of investigation for many years;[15] however, the pandemic exacerbated wellbeing concerns[16] that were already overwhelming many frontline employees. These employees are struggling to cope with the physical and mental demands of the 'new normal', with the popular press replete with examples of customer rage and aggressive actions against employees. Service workers in retail, hospitality and personal services are 'the forgotten frontline', as they often receive less attention in media and research.[17] Further aggravating the impact on workers and organisations is the fact that managers are often faced with conflicting choices – whether to 'stay open' or to take an empathetic stand in terms of employee wellbeing.[18]

The after-effects of COVID-19 have exacerbated the lack of available labour, with many employees seeking to reskill after long layoffs/furloughs, especially in the aviation and hospitality sectors, or choosing not to return to their prior positions or sectors of employment. This is placing even more pressure on organisations as economic conditions return to or exceed pre-pandemic levels (for example, hospitality and leisure travel as well as many personal/professional services are experiencing notable surges in demand). In turn, this is taking a toll on those employees still working in these sectors, particularly on their wellbeing – with burnout, exhaustion and attrition at high levels. Many of these service employees still work in jobs with low pay, uncertain hours and lacking security.[19]

There are some indications among a growing group of frontline employees that, post-COVID, financial compensation is no longer seen as the primary form of motivation to work in a service role. Rather, employees are placing increasing emphasis on their own wellbeing and on being aligned with the service organisation's values, culture, motivations, and mindset, as well as on receiving training and developmental opportunities. If these organisational factors do not line up with those desired by employees, then the employee may perceive a lack of fit with their role and become disengaged or seek employment elsewhere.[20] An unwillingness to address these employee concerns can accrue significant opportunity costs for service organisations.

A further conundrum is that many services perform vital social functions beyond economic goals. From essential goods to leisured services, retail and hospitality respectively are crucial for society. Perhaps more poignantly, so are the skills and labour shortages in the healthcare and aged care sectors, which are deeply impacting the wellbeing of those sectors' patients. Workers carry many of the burdens of these failings.

Pictured left to right: James Tarbit, Prof. David Solnet, Anshu Sisodia

What are the opportunities?

The post-pandemic challenge of labour and skills shortages poses a significant threat to the wellbeing of service workers. However, it also presents an opportunity for service organisations to leverage technology and AI to address this issue. A range of service organisations augmented their existing human capital base and increased productivity through embedding automated technologies into their digitised service value chains in response to COVID-19. Examples include venue QR code check-ins, online food delivery services, QR code menus and ordering, self-service checkout, SMS ordering and app-based hotel keys.

The increasing sophistication, reach and flexibility of AI systems can also be used to support employee wellbeing and they are, in fact, already being adopted in human resource management (HR) systems. There are AI mechanisms for health, insights, communication, platforms dedicated to mental wellbeing, staying active, nutrition, sleep and the management of health conditions. For instance, wearable devices are now able to support health assessments and progress tracking, developing personalised recommendations and online communities' support. Platforms such as Workday and Virgin Pulse support the collection of real-time data, provide feedback, employee insights and sentiment analysis.

Apart from these AI-powered wellbeing platforms or devices, service organisations can also leverage AI technology to enhance employees' wellbeing by reducing workload and the risk of workplace accidents and injuries, creating a supportive workplace culture. For example, chatbots and virtual assistants can be used to handle customer service queries, freeing up employees from mundane and repetitive tasks, allowing them to focus on more complex tasks. This can enable employees to have more physical, affective and cognitive energy for more meaningful components of their work roles, therefore protecting them from experiencing emotional distress. Moreover, organisations can use AI-powered solutions to analyse employee data and performance metrics to develop personalised training and development plans for employees, helping them to acquire new skills and knowledge and to feel valued and supported in their roles. As service offerings become increasingly digitised, so the traditional unidirectional service value chain is giving way to a new service business

model paradigm where value is co-created between the firm, service provider and customer. Because of this paradigm shift, the ways in which service actors such as employees perceive and recognise value are fundamentally changing and contributing to the current labour and skills crisis in the Australian services sector.

Moreover, the role of human capital within frontline service applications is gradually being redefined. Whereas service exchanges were once exclusively focused on the provision of an end-product for consumers, consumers are now placing higher demand on human experiences, inclusion, customisation and personalisation. Consequently, the competencies, skills and capabilities of frontline service employees must be extended or augmented to meet these emerging service demands. However, service firms have struggled to address these human capital shortfalls due to the ongoing skills and talent shortages across the Australian service sector.

In facing these challenges, service organisations can augment their existing human capital base through embedding automated technologies into their digitised service value chains. For instance, increasing sophistication, reach and flexibility of AI systems offers service firms, employees and customers a variety of solutions in approaching these challenges. However, concern is noted by Anshu Sisodia, Co-Founder A&K Marketing and Finance Advisory, who argues that "More discussion is needed on the interface between AI adoption and staff training – and their joint interface with the communication content that organisations utilise as part of the AI transformation".

If utilised as a service role resource, AI can reduce the cognitive demands placed on employees and increase their role satisfaction and engagement, although this statement has been contradicted by researchers. AI can also be used to collect customer data and produce instantaneous tailored service recommendations, automate menial administrative tasks, increase service efficiencies and reduce supply chain wastage, and provide personalised coaching/mentoring for individual employees. Furthermore, AI applications can be customised to suit the needs of individual frontline employees, where the level of role automation and interaction with the employee can be adjusted to align with the employee's mentality, values and expectations of inclusivity.

Recent work about technology adoption in the workplace signals further challenges that need to be addressed. Technology tends to help the organisation but not necessarily the employee. There is a perception that end-users – both employees and customers – are not benefitting from technological innovations to the same degree that organisations are. There are other relevant questions in the current narrative. Keith Burchill, Co-Founder A&K Marketing and Finance Advisory, points to whether "financial benefits of technology cost reductions are going to companies or to employee wages".

"More discussion is needed on the interface between AI adoption and staff training – and their joint interface with the communication content that organisations utilise as part of the AI transformation."

Anshu Sisodia, Co-Founder A&K Marketing and Finance Advisory

Recommendations for policy and practice

Labour and skills shortages are having adverse effects on the service sector and are impacting the wellbeing of the current workforce. This section of the white paper has highlighted the nature of the problem and addressed how technology can positively or negatively affect the wellbeing of frontline service employees. Despite having many advantages, AI and other technologies should not be considered by service managers as a simple solution to the current labour and skills crisis. If implemented ineffectively, technology systems can fail to achieve return on investment (ROI) targets, worsen the existing skills/talent gap, and further exacerbate negative perceptions among service employees.

Therefore, to ensure that new systems are properly implemented to benefit frontline service employees and to address the symptoms of the ongoing labour and skills crisis, we now outline six broad recommendations for managers and policymakers.

1

Be proactive and positive-minded about changes.

Managers who make excuses for or set aside implementing AI-focused changes to their supply chain (e.g. not having enough time, upfront cost considerations) will incur increasing opportunity costs for their service organisation as the labour and skills crisis worsens. Service managers must step away from placing liability on external issues (e.g. tight labour market) and proactively tackle these issues.

2

Apply humanistic management principles.

A people-centric management philosophy is characterised by demonstrating compassion and empathy towards service workers in a way that supports and respects everyone.[21] Organisations that proactively and intelligently apply a people-centred approach to managing employees have less trouble attracting, retaining, motivating and enhancing the wellbeing of frontline employees (e.g. genuine team involvement in decision-making). There is a growing need for organisations to support social connections, psychological safety, and safe workplaces that encourage engaged conversations and mental health awareness through the HR function.

3

Change the organisational mindset to achieve cultural changes.

Service managers must be willing to implement AI systems to address a systemic mindset, inclusivity and cultural issues within their service organisation. Service managers must connect with their employees at a human level to understand how the AI systems need to meet employee needs, and to ensure that their firms' values and mentality are aligned with those held by their employees.

4

Lead by example.

Many organisations find that their well-developed policies and practices are 'lost in translation' as they filter down (or not) through the organisation. Supporting and holding leaders accountable in this regard is critical.

5

Beware the silver bullet.

Many service sector organisations are strongly advocating for politicians to allow them greater access to international labour markets (e.g. working holiday makers, backpackers, international students, other visa classes). These low entry barrier service and manual labour roles (as distinct from technical and professional roles) are both disposable (as COVID-19 evidenced) and unsustainable. Moreover, these workers are almost invariably the worst treated, most vulnerable and least securely employed. Their treatment undermines the many positive practices mooted here.

6

Do not ignore the deep structural and cultural issues that have blighted (frontline) service work since well before COVID-19.

While wicked problems are in need of reform at multiple levels, ultimately the usage of AI must align with the fundamental human needs of employees and customers – as well as organisations.

Pictured left to right: Prof. Janet McColl-Kennedy, Assoc. Prof. Christoph Breidbach

PART 2

Three technology trends can help accelerate digital service transformation

Embracing cybersecurity-as-a-service

Theme Leads: Ivano Bongiovanni and Ryan Ko
Panel of Experts: Gordon Archibald, Mitch Field, Glen Gooding, Thomas Magor, Joshua Scarsbrook, David Stockdale, Wenlu Zhang

In the last 15 to 20 years, an ever-evolving cyber-threat landscape, coupled with technological advancements and societal shifts that have put cybersecurity under the spotlight, has created a vibrant marketplace in which consumers and providers are characterised by one main trend: fragmentation.

Only recently have larger organisations started to consolidate their portfolio of services, mainly through the acquisition of smaller, highly specialised players, in the multifaceted market segments that characterise cybersecurity: incident detection and response; cloud security; networks; identity and access management (IAM); and governance, risk and compliance (GRC); among others. This has led commentators and specialists to observe this as a trend moving forward, with some significant names in the market already extensively playing working in this space.[22]

At the same time, large cloud providers and data warehouses (e.g. Amazon, Google, Microsoft) are becoming major distribution channels for cybersecurity services. The integration of cloud services with in-designed cybersecurity is a promising avenue for clients ranging from larger organisations to SMEs.

What are the challenges?

The interaction between service providers (managed security providers, or MSPs) and service consumers is very differently shaped in cybersecurity, as opposed to other industries, mainly due to the shifting role played by cyber-criminals, who have the potential to dramatically change the dynamics existing between demand and supply.

Consumers are mainly trying to solve traditional issues with cybersecurity, which is associated with their need for compliance and expertise coupled with an urge for visibility (e.g. understanding who are the 'baddies' and what their next moves will be), but only to the extent in which this does not clash with an organisation's strategic goals. After all, cybersecurity is mainly about risk mitigation and loss prevention, two activities that are often perceived as being at odds with growth and innovation.

Practically speaking, this translates in the consumers' need to understand what data is critical to their business (for which protection and redundancy are crucial). Such an exercise has traditionally been associated with conversations held 'in the basement' of IT departments and cybersecurity units. Nowadays, these discussions are finding their way in other organisational areas, such as top executives' offices and boardrooms. The Australian Securities and Investments Commission (ASIC) has already confirmed they will keep board members more and more accountable for data breaches within their companies.[23]

However, understanding what and where the 'crown jewels' are is an endeavour that service providers often leave to the clients' discretion to act upon. In this sense, a more customised, hand-holding approach by service providers would go a long way in differentiating them from competitors in the eyes of their clients. Currently, the only differentiator clients often see in the plethora of providers they regularly interact with is pricing. Against this backdrop, MSPs have the potential to support their clients in another epochal transition that is characterising cybersecurity – the move from a maturity-based approach towards a risk-based one,[24] in which integrating an understanding of cyber-risks into an all-hazard organisational approach (enterprise risk management, or ERM) is paramount.

Another challenge could nonetheless emerge. Within a risk-based perspective on cybersecurity (e.g. controls cannot be sustainably built or purchased for all cyber-risks and therefore prioritisation is essential), customisation and evidence-based advice require extensive data and information sharing. Given the current threat landscape and trust issues, clients may not be willing to provide this information, especially when AI is involved. What guarantees do they have that this information and data will not be used against them? The complexity (and, more often, scarce affordability) of current cyber-insurance policies makes this question a harder one to answer.

From a business perspective, the current usage of AI by MSPs is a double-edged sword: on the one hand, it is undeniably helpful for enhanced threat containment and incident response; on the other, its usage by MSPs mainly for efficiency and to cut costs (rather than to improve services and value for clients) is unlikely to translate into a winning strategy.

What are the opportunities?

The incredible expansion of the cybersecurity market (information security and risk management spending is expected to grow at an annual compound rate of 8.2 per cent from 2019 to 2024, to reach USD$207.7 bn[25]) has led several MSPs to lag behind in terms of the services they offer when compared to the evolving threat landscape. This is also due to the limited maturity of clients in understanding their needs and keeping up with change, with some MSPs said to be 10–15 years behind the curve. The growth of demand has nonetheless offset this, allowing revenues to expand, regardless.

However, the way forward looks very different and, as mentioned above, will require MSPs to demonstrate leadership and a strategic approach to addressing their clients' maturing expectations. As educated service consumers will consider the knowledge and experience of providers when selecting one, specialisation will be essential, as will the MSPs' ability to shift from pure service provision to application. For example, consumers will likely become more demanding in terms of obtaining support to build their cyber-resilience. Trusted relationships and the capacity to build enough intimacy (for example, through specialisation by industry or size) will be a powerful differentiator, especially in light of regulatory changes that push towards increased accountability around data protection. In this scenario, clients will likely want a more prescriptive approach from MSPs ('don't give me options, tell me what I should do').

Market opportunities will also emerge for providers capable of integrating their services to approach their clients' end-users as much as possible. Education of end-users and the general public, thought leadership, and an increased attention to the cybersecurity needs of expanded stakeholders' networks will be crucial factors for key competitive advantage among MSPs. In this sense, a B2B2C business model can yield significant returns for MSPs that can master it.

Associated with these expanding dynamics are issues of data protection at the individual level and what MSPs can do in this space. Questions around boundaries and constraints for data capture, legal and ethical usage of data, physical storage and data sovereignty are sure to keep animating hot debates in the cybersecurity world for years to come.

Overall, the current dispute around what cybersecurity services can best be outsourced and what would instead require an 'in-house' approach is deemed to be shaped, in the near future, by considerations around the points we have just described. Automation, again, will play a significant role in determining the future shape of cybersecurity as a service. A possible trend will be towards the outsourcing of operational aspects of cybersecurity (e.g. security operations), as supported by automation, and insourcing of tactical and strategic functions (e.g. GRC; strategic decision-making). MSPs can play a significant role in supporting both, offering better operational services at lower prices and customising tactical and strategic advice. One big caveat does exist: adversaries – by means of new threats or innovative business models[26] – maintain the potential to shift any prediction in this space.

Pictured left to right: Dr Ivano Bongiovanni, Dr Thomas Magor, Prof. Ryan Ko

Recommendations for policy and practice

Based on the considerations discussed here, a series of recommendations are here proposed for managers of MSPs and policymakers alike.

1. **Utilise AI with a degree of customisation to maximise value for clients, not simply to reduce costs.**

2. **Help clients educate their employees and end-users to increase the overall cybersecurity culture of the organisation.**

3. **Never stop innovating.**

   The expansion of the cybersecurity market since 2005 (which is considered a turning point in cybersecurity[27]) has been astonishing, but signs of contraction and paradigm shift are present.

4. **Dedicate effort to your relationship with MSPs in order to obtain tailored, customised service from them and significant performance improvements.**

   Thinking that 'signing cheques' is the only thing you will need to worry about is, at best, misleading.

5. **Facilitate the creation of a common language to improve market awareness.**

   The needs of SMEs and larger organisations are deeply different, and a common language can go a long way in establishing a solid baseline.

6. **Establish trusted communication platforms on which interested stakeholders (e.g. MSPs, clients, researchers, government organisations) can freely share information.**

   On this note, attackers are much better at sharing intelligence than defenders are!

Using blockchain technologies in service

Theme Leads: Christoph F. Breidbach and Paul P. Maglio
Panel of Experts: Jason Lowe, Paddy Krishnan, Marten Risius, Jenine Beekhuyzen, Daniel Heinz, Jing Yang

Blockchain is decentralised ledger technology that enables individuals and organisations to keep track of transactions securely, and without a central database or central authority. Transactions recorded in a blockchain use strong cryptography and are considered unalterable – a permanent and correct record. This is why there are many potential applications of blockchain in service settings today. Essentially, service firms can benefit from blockchain technology whenever records need to be kept and exchanged in distributed environments; contracting, supply chain, and 'fintech' settings are some of the most prominent use cases of blockchain. Indeed, the Global Financial Crisis (GFC) of 2008 significantly decreased customer trust in financial services and challenged the status quo of mainstream banking with the emergence of Bitcoin, the first cryptocurrency, and still one of the most well-known use cases of blockchain technology today.[28] But potential uses of blockchain in service reach well beyond Bitcoin. In what follows, we explore current challenges, outline emergent opportunities, and provide some guidance for those wanting to benefit from blockchain technologies in service settings.

What are the challenges?

Blockchain is an emerging technology, and so it is sometimes still poorly understood in the mainstream business environment – in Australia and many other countries. Blockchain is often identified with specific uses, such as cryptocurrency or non-fungible tokens (NFTs), both of which make frequent headlines because of their novelty, size of investments or fraud. This narrative has negatively impacted the perception many have of blockchain technologies.

In a general sense, blockchain technologies provide solutions to problems that should be solved using secure, reliable and trackable transactions. Discussion of blockchain often takes place in an echo chamber of promoters and researchers who see an approach to solving certain kinds of problems, creating hype but little real value for businesses today. Many think that speculation and investment in blockchain will not pay off in the long run, and there have been some spectacular failures already (e.g. FTX).

We think that it is too early to tell with certainty whether blockchain will help address real problems, such as climate change or socio-political issues, or contribute uniquely to the UN Sustainable Development Goals. In fact, one might compare this situation to the early days of the internet or world wide web in which many different applications or uses were developed – some succeeded and some had significant impact, but all went through a process of refinement and evolution. Consider technologies such as BitTorrent and Napster, very early approaches to large-scale file sharing on the internet: neither succeeded, but both had a profound influence on the ways in which video and audio media are shared and streamed today in applications ranging from YouTube to iTunes. Therefore, as well as technological influence these initial developments had significant business and economic implications. In the context of this white paper, we conceptualise the managerial challenges associated with blockchain in several ways that are expanded on here.[29]

How can we improve existing services with blockchain?
Industry incumbents across many different contexts often attempt to alter their services with technology in response to threats posed by new market entrants. This process is increasingly difficult – especially in the blockchain space, which is characterised by rapid technological advancements and the limitations posed by existing regulations. It is therefore important to understand if, how and to what extent existing services can be improved by using blockchain technologies, and to assess how incumbents as traditional intermediaries should respond to the new decentralised services that blockchain solutions enable.

How can we develop service innovations with blockchain?
Some new blockchain-based services aim to better connect customers with one another. But should individual customers be given autonomy in decentralised settings, or are intermediary markets more efficient? Many blockchain-based service innovations today are in an experimental stage. When thinking about service innovations with blockchain, challenges arise, ranging from new and improve service experiences to reduced transaction costs and increased societal inclusion. Ultimately, there is great potential in using blockchain to democratise many service innovations, but we are relatively early on this journey.

How can we manage the narrative associated with prominent blockchain applications?
Cryptocurrencies and NFTs are arguably the most prominent applications of blockchain technology today. Both promise to enable and increase the efficiency and security of digital financial transactions. Both also fundamentally change financial markets by removing the need for governments to issue legal tender or for banks to act as financial intermediaries. However, given the importance of currencies as mediums for economic exchange in any economy, identifying the boundary conditions to govern and regulate the appropriate use of cryptocurrencies has become one of the most critical challenges in financial services. The narrative surrounding these applications is generally biased towards polar viewpoints; a more nuanced narrative would benefit the wider proliferation and adoption of blockchain technologies in service today.

How can we regulate emerging blockchain applications effectively?
Regulatory environments usually differ across countries, especially as they relate to new technologies. However, it appears almost universal that regulation lags behind technological developments. Because developing blockchain-enabled services can be challenging, we need to develop appropriate regulation that is aligned with technological progress. Without this, it will be difficult to facilitate service innovation and ensure market performance.

How can we foster growth of blockchain incubators and start-ups?
All new ventures and market entrants operate in a rapidly changing context. However, the uncertainties that arise from technological progress and comparatively conservative regulations affect new market entrants more than they affect industry incumbents. If we are to benefit from the prospective improvements promised by blockchain technology in service settings, then we also need new approaches to foster the incubation of blockchain start-ups.

Ultimately, as with many early-stage technologies, the community of blockchain users today is not very inclusive and there are high barriers to entry, including in both technology (specialised software) and policy (lack of regulations and trust). Overcoming such challenges will require time and focus.

What are the opportunities?

We see many opportunities to use blockchain in service contexts. The biggest opportunity of blockchain technologies in service may ultimately be its ability to help us solve societal problems rather than business problems. This is because blockchain technologies can provide anonymity for users, provenance of data, verification of property and transparency of transactions. This makes blockchain uniquely suitable to trigger a shift in societal power. For example, blockchain could enable new applications for identification (know your customer), which could encourage customers to behave a certain way (e.g. to save energy, conserve water, engage in recycling etc., which are all needed to combat climate change at scale). At the same time, shifts in power allocation are also an important prerequisite when attempting to democratise many existing service systems that are currently not accessible for a wider range of non-expert users. In this sense, blockchain applications could enable individuals to start their own banks (i.e. through P2P lending), rather than being forced to rely on an arguably fragile commercial banking system that operates under fractional reserve banking rules.

The second major opportunity of blockchain in service relates to its ability to reinvent existing service systems. Simply put, rather than attempting to apply blockchain to existing systems in which other technologies might be more efficient, we should aim to change the norms, rules, and authority of these existing systems themselves, asking how blockchain might facilitate this change by considering what blockchain can offer that other technologies do not. For instance, although we acknowledge the need for incumbents to explore ways to use blockchain technology, it might be more advantageous not to attempt to apply blockchain in existing financial systems and institutions, but to consider ways blockchain technologies could enable the creation of entirely new systems or new financial institutions, such as decentralised financial institutions (DeFI) that could overcome the systemic challenges we can observe in the mainstream banking context.

The third major opportunity of blockchain in service relates to its role as digital infrastructure rather than as a specific technology, a viewpoint which limits its potential. If we view blockchain as digital infrastructure, then we can adopt a macro-level lens that helps us to develop industry standards or industry bodies, highlight individual use cases, develop ethical standards, and consider the interplay of skills, context and outcomes. This will have multiple benefits. We believe that these outcomes will make the customer experience as seamless as possible, which will in turn lower barriers to entry and improve usability. It will also encourage and educate young people about careers in blockchain and therefore provide important societal inputs for innovation, prosperity and, ideally, societal wellbeing.

Pictured left to right: Jing Yang, Dr Jenine Beekhuyzen, Jason Lowe

Recommendations for policy and practice

We have suggestions for current practitioners and policymakers who want to lead us into the future of blockchain applications in service.

1

Change your mindset.

In every technology-driven setting, it is pivotal to understand, appreciate, evaluate and embrace change. Change is inevitable, and new useful technologies will eventually prevail. We cannot predict future blockchain-related developments, but we know that changing earlier is probably better than changing too late.

2

Balance exploration with exploitation, focusing on finding new ways to benefit from new technologies within specific industry contexts.

Exploration can be challenging, so it is likely useful to learn from the adoption, use and trajectories of technologies that previously went through 'hype-cycles' (e.g. HTML and peer-to-peer sharing platforms). By looking back, we may be able to identify opportunities for the application of blockchain technologies across multiple contexts, industries and geographies, and eventually and experiment with the use of blockchain therein.

3

Embrace novelty.

Innovation often emerges from new market entrants and those who do not hold too tightly to established markets, organisational structures and ways of thinking. Welcome newcomers, especially if you are an industry incumbent. If you are a policymaker, acknowledge that major technological advances related to blockchain will more likely arise from the work of new market entrants than from contributions made by incumbents.

4

Govern from the ground up.

Policymakers and regulators are tasked with governing an increasingly complex and dynamic digital environment. Industry incumbents are usually well-versed in their lobbying efforts and attempts to affect policy changes that, at worst, inhibit new emerging technologies or their applications. In the case of blockchain, close collaboration with new market entrants, start-ups, or social collectives – cryptocurrency communities – will likely be a much more beneficial way to access much-needed tacit knowledge. We encourage policymakers to foster the development of policies that lead to a fair and healthy innovation ecosystem for blockchain technologies and Australia's service economy.

Creating AI value propositions

Theme Leads: Samuel C. MacAulay
Panel of Experts: Claire Cunningham, David Nagel, Jan Sobus, Sandeep Mathur, Thomas Kohlborn, Damian Vassallo

AI promises to revolutionise our economy and society. For example, recent studies suggest that ChatGPT, a 'generative' AI product, has increased the productivity of software programmers by 55.8 per cent and policy writing (e.g. strategy) by 37 per cent.[30] Productivity improvements such as these are beyond those seen with the introduction of the electric engine. The general-purpose nature of AI suggests these impacts will be felt across most aspects of organisational life. We are at the dawn of a new age filled with uncertainty and opportunity.

What are the challenges?

Our group was formed on the basis that we are all navigating similar challenges with the large-scale deployment of AI into business. These range from the deployment of autonomous solutions in mining and the use of AI in medical imaging through to the use of chatbots to automate writing. In each of these settings, innovators need to simultaneously navigate extreme technical (e.g. 'Will this work?') and market (e.g. 'Will this be valuable?') uncertainty to validate the viability of product and service solutions.

Participants in our group identified three ongoing challenges to getting this right. The first is running effective experiments. While experiments are a very effective way of reducing uncertainty, to run a good experiment on AI deployment we need good data; otherwise, it's garbage in, garbage out. To get such data, we partner with clients and users. Selecting the 'right' client/user means grappling with both operational and strategic questions. We need to ask, operationally, does the client/user have the data required? And can they provide it in the format and within the timelines required? Strategically, we also have to identify clients/users who are strategically compatible. For example, if the competitive strategy for your new product rapidly saturates the target market but your partner's strategy relies on a period of exclusivity, this lack of strategic compatibility is going to make the cooperation required for effective experiments close to impossible. Getting the right level of operational and strategic engagement across the businesses involved is thus a major challenge to success.

The second challenge is explainability. Getting buy-in from senior management, investors, regulators, and customers requires that the way the AI products work needs to be 'explainable' to stakeholders. This goes beyond the usual concerns of the ethics of AI and more pragmatically towards the fact that, even if people like the solution being generated, they will be reluctant to invest in it or adopt it unless they know how and why this solution is being generated. The challenge here is not just a technical one associated with the way different AI products are built, but to the fact that the business imperative of explainability has not always been understood by frontline engineers nor budgeted for by organisations.

Finally, the third challenge is the need for architectural innovation. Extracting full value from AI solutions means business transformation. Plug-n-play deployment strategies are ineffective. For example, extracting the full value from deploying autonomous vehicles to mine sites has not simply been a case of replacing human operators. Instead, a series of investments are needed, ranging from centralising operations close to major metropolitan centres – thus reducing costs and tapping into new labour markets – through to redesigning mines around new safety parameters. This means that an unusual constellation of stakeholders from the client/user organisation is required to prototype these solutions and drive implementation. The breadth and depth of engagement has to be strategic rather than purely operational, otherwise deployment will fail.

What are the opportunities?

Our group believes that conducting business experiments (e.g. in-market product trials) with clients and users provides a powerful opportunity for tackling the uncertainty standing between the lab and delivery of new AI value propositions to market. However, building new value propositions through experimentation is not without challenges. Organisations need to identify where and how to deploy AI to create new value propositions. History tells us that this process is not straightforward. It took decades trial and error learning for steam-powered businesses to discovery how to effectively electrify their operations. They had to change everything from the architecture of factories and the way they trained their workforce through to the value propositions being delivered to customers.

Recommendations for policy and practice

Reflecting on the challenges and opportunities we identified, we distilled three recommendations. The approach offers leaders a means to navigate the challenge of co-creating new AI value propositions.

1

Be strategic about project selection.

Getting the client (or user) and project right is an underappreciated but vital determinant for successful experimentation. There needs to be early, deep strategic engagement by a cross-functional team composed of those with the strategic, engineering, and operational knowledge. This composition ensures the team has the knowledge required to inform the selection of the right project as well as the knowledge and charter needed to inform how this project will shape future projects and ultimate market penetration. For example, is the reputation of the client you experiment with going to be critical to the credibility of your solution in the marketplace? How will you trade this off against an alternative client who might have less credibility in the market, but a more attractive dataset (e.g. easier to ingest). Too often, these project selection choices go bad because they are made by those with only one piece of the strategic puzzle. Organisations that succeed at project selection for experimentation have a very clear distinction between projects aimed at building new-to-market solutions versus those that focus on incremental iterations to existing solutions. The former requires a much more strategic approach than the latter.

2

Build enabling governance guardrails to manage risk.

Governance processes often get blamed for stifling innovation. However, the lack of governance processes across Australian organisations, industries, and government when it comes to AI is currently hampering experimentation and progress. We believe leaders need to work across these boundaries to build norms and regulations around acceptable use. This way an environment for innovation can be created that enables AI to be ethical, lawful, and technically robust. At the organisational level, this might be as simple as developing a standard on how explainable AI solutions need to be prior to securing funding at each R&D stage gate. Creating an operational model that minimises the risks of immature AI solutions being progressed through the final stage of the innovation process is key. At the industry level, this might involve working with professional associations, such as the Chartered Accountants Association, to develop shared rules on the types of tasks AI can be deployed on and the level of testing required prior to this. The key point we want to impress on leaders is that governance and risk management can act as a guardrail speeding up innovation in this area and is thus crucial to invest in.

3

Embrace modularity.

With the current rise of cloud and service-based solutions, which undergo constant evolution and upgrades, the traditional 'waterfall' approach of building monolithic solutions in a step-by-step fashion has become highly inefficient. It is especially apparent in the applications involving AI, where the first solution is rarely the one which is deployed in production and the deployed solution needs to be continuously fine-tuned to address the client's needs as data patterns evolve and new datasets emerge. Our group had tackled this challenge by modularising the full solution/service into smaller, single purpose microservices that can be developed, deployed, and tested independently. Such development processes, despite higher initial cost of setting up communication layers between microservices and defining their interfaces, enables rapid prototyping, parallel work on separate components of the solution (and testing out different solutions to the same problem – for example, various flavours of AI models) as well as seamless deployment, one that is invisible to end user. Investing in modularisation makes it easier to meet the business transformation in iterative steps, rather than trying to change everything, everywhere, all at once.

Pictured left to right: Damian Vassallo, Dr Samuel C. MacAulay

PART 3

Digital service transformation impacts us all – but we must work together to achieve it

Achieving sustainability through digital service transformation

Theme Lead: Damian Hine
Panel of Experts: Alexandria Gain, Rebecca Sigrist, Jerad Ford, Owen Williams, Thomas Hall, and Shane O'Kane

There is an urgent need for a new approach to service transformation that considers the sustainability imperative – one that contributes to developing human societies while preserving and maintaining the Earth system at the planetary scale.[31] Technology has a major role to play in enhancing the human experience, such as through the provision of improved health in remote communities supported by both combined telehealth and MedTech solutions; or the application of digital twins to assist communities in managing their physical landscapes with precision. Increasingly, we are seeing digital technologies as an avenue to sustainable development. Yet, the rise of new technologies also creates disruptions and complexities in firms' pursuit of sustainability.

Discussion of sustainability and transformation naturally elicits analogues of biophysical systems and populations of organisms.[32] Darwinian evolution instructs us that change can come about through mutations at reproduction. This is analogous to new ventures, innovative products and even the introduction of new policies and practices, which, if proven successful, will lead to growth and reproduction, passing on and embedding new processes and business models. But the greatest impact on evolution is geomorphology, the significant changes in the physical environment in which populations exist, where unpredicted cataclysmic events can drive major evolutionary change. In our current context, as with the invention and adoption of the internet, we are seeing tremendous reflection and even concern around the impact of digital technologies – most notably, deep learning AI – on business, but even more tellingly on humanity and the planet.[33]

Evolutionary theory further emphasises diversity and symbiotic relationships as being crucial to the development and sustainable transformation of firms and the broader service ecosystems. For example, there is considerable evidence, ranging from the collapse of populations of US passenger pigeons[34] to coral ecosystems declining in the Western Indian Ocean,[35] where a lack of genetic diversity in a population will increase the likelihood of its demise. Diminishing diversity lessens the resilience of populations against disease, predation and climate events. This lack of resilience can be attributed to genetic homogeneity, the very factor helping to build scale and dominance in areas such as agriculture with monocultural dominance of a limited number of grain crops, and also to oil and coal as the global industrial energy feedstocks for a century. The Irish potato famine of the 1840s exemplifies the interaction effect of monocultural dependence bringing about a human population collapse.

At the same time, the adaptation of natural ecosystems illustrates the many benefits that can be gained from symbiotic relationships – analogous to partnerships, collaborations, and knowledge-sharing. Like strategic alliances, joint ventures, incubators and accelerators, symbiosis enhances firms' capacity to transform and adapt to the disruptions of digital technologies.

If employed appropriately, digital technologies offer a myriad of opportunities to transform service to improve the wellbeing of people and the planet.[36] This can be viewed through the lens of sustainable evolution in a dynamic services ecosystem – one that is seeking positive impact through environmental, social and governance (ESG) while still functioning effectively within a market system. Explicit is the need to provide real solutions with short- and long-term impact, balancing operational efficiency with innovation, while sustaining such outcomes in a dynamic service environment.

Pictured left to right: Dr Alexandria Gain, Dr Jerad Ford

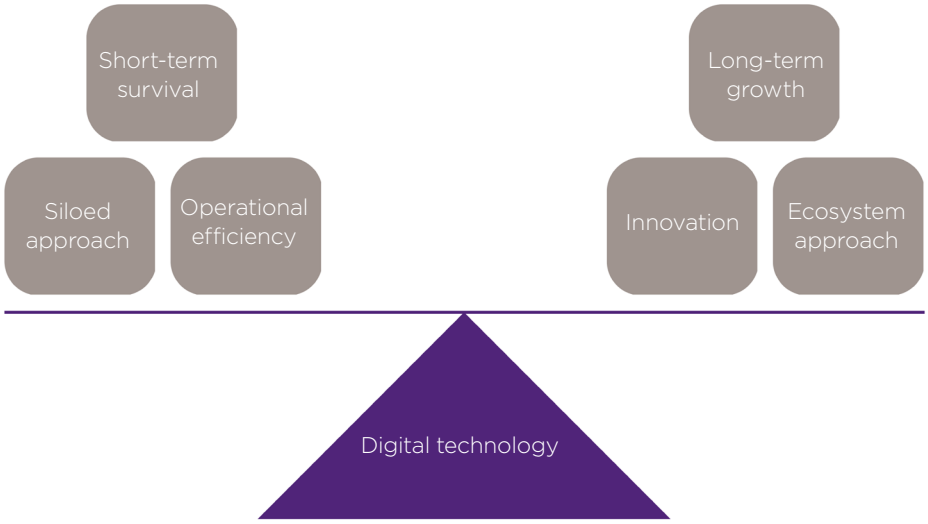

Figure 2. Digital technologies to balance short- and long-term sustainability. Source: theme lead and panel of experts

These two goals are often regarded as incompatible, as the short-term need for efficiency and profitability competes with the resource intensity and medium- to long-term view that innovation requires (Figure 2). The following sections speak to the complexities of such a 'balancing act', highlighting the opportunities and challenges that digital technologies bring, and offering recommendations for policy and practice.

What are the challenges?

For hundreds of years, economies of scale have been the dominant force in business as the path to success, based on replicating successful production processes and units to achieve profit maximisation. However, just as legitimate, but much less understood, are economies of scope. In his book *Scale and scope, the dynamics of industrial capitalism*, Alfred Chandler made the clear case that economies of scale do not deliver long-term sustainable growth for large multinational companies.[37] Rather, it is economies of scope that sustain companies through the highs and lows of economic cycles, offering the opportunity to seek and find new niches and markets when the old ones mature and decline. These economies of scope build diversity and resilience – essential to avoiding population collapse.

For scale-focused organisations, the trade-off between short-term survival and long-term growth also limits the potential for simultaneity – increasing returns in the same accounting period that investments in innovation occur. The lag between investment and return has long been a barrier to the adoption of new technologies due to inherent risk and the un-measurability of uncertainty. This is particularly so in the current economic climate, where investors are not just looking for future asset value driven by scope. Rather, they want to see that a business can survive through downturns by building its cash flow so it can flourish without constant outside intervention and support. This is antithetical to population resilience, as it restricts evolution of firms and limits diversity. One of the best examples of population collapse occurs in markets; cryptocurrency, the GFC and dotcom bubbles are recent examples, but the 17th century tulip market crash shows a long history of crashes and population collapses in markets just as they occur in nature.

Economies of scope strategies and the selection of sustainable paths by firms seem obvious if we take a long-term perspective, but achieving ESG targets also requires overcoming the path dependence of traditional approaches that deliver short-term efficiencies, such as vertical siloes. As such, a natural tendency is still to break down service ecosystems to a sub-system level, largely due to the complexity of establishing adaptive systems, including the organisational capabilities to handle the myriad dynamic data points that need to be integrated into decision-making. Even if we use disruptive technologies such as AI to overcome these limitations, the lack of trust in the solutions they offer may remain a rate-limiting step, especially where solutions are implemented by humans, bounded by their domain knowledge and cultural lenses. As Thomas Hall, Director, AgriBusiness Connect, emphasised, "Increasing understanding and knowledge of new technologies is key to combatting misunderstandings and resistance to their adoption".

The problem in designing and achieving transformative service-focused ecosystems is the articulation between their complexity, our tendency to focus on a more micro level, and concentrating our gaze on spaces that are most familiar and comfortable. This is where multiple domain expertise can be brought in and integrated, but the social processes that underpin successful integration, such as open communication and establishing high trust environments, must be foundational to the solution. This is because most experience is not at an ecosystem level and our actions are usually guided by the lens through which we see the world. Driven by profitability and efficiency, operations are typically focused on economics of scale. But without profitability, long-term growth goals remain unachievable.

> "Increasing understanding and knowledge of new technologies is key to combatting misunderstandings and resistance to their adoption."
>
> **Thomas Hall, Director Agribusiness Connect**

What are the opportunities?

One of the key trends we are witnessing in services and beyond is the impact of digital technologies and the integration of AI into service provision. This will likely have a profound influence over the next 5 to 10 years, and is currently the source of much conjecture about what business models will emerge to most effectively integrate and utilise AI. Digital technologies and AI have a crucial role to play in addressing sustainable evolution, long-term positive impact, and balancing both operational efficiency with innovation for sustainability. AI in services can have a tremendous effect on compressing the lags between expenditure and ROI by breaking path dependence and dramatically increasing agility. AI can help overcome the trade-off between scale and scope if generated and managed appropriately. The precision that AI brings at the operational level – through production and supply chain efficiencies – can also enhance progress toward net zero emissions.

Harnessing AI for short- and long-term sustainability represents a major role in increasing the efficiency of operations. Automation and digital transformation offer greater levels of precision that also bring with them potentially substantial improvements in productivity. These improvements offer better ROI over time, allowing for the resources that are required to support innovative thinking and action. This runs counter to one of the major theoretical management paradigms that has emerged in recent years, attention theory, which indicates the advantages for individual firms of focusing on their core business, and competitive advantages, effectively "sticking to their knitting".

With the deep learning basis of AI, service operations may be improved while developing a strong evidence base to support and benefit from the dynamic forward-facing nature of AI. Shane O'Kane, Strategic Advisor EY Brisbane, raised the importance of harnessing the long-term sustainability benefits that naturally emerge from the adoption of such digital technologies: "the more technology we deploy to other challenges, whether it be automation, IoTs, or robotics, the more opportunity we provide for AI to analyse and validate improvements for sustainability". Owen Williams, Manager, Agtech and Logistics Hub, added "There is potential to capture better data, inherently generated through the use of digital technology, to facilitate AI learning in the background."

To provide 'real' digital solutions that create sustainable value for all stakeholders, service firms need to take horizontal and vertical approaches to collaborations. Like natural ecosystems that thrive and are better equipped to adapt to disruptive events when there is greater diversity, service ecosystems and the firms interacting within them can benefit from the knowledge sharing and innovation that arises from including and collaborating with multiple stakeholders.

Co-design and customer orientation are at the core of service innovation and effectiveness. Inherent to this is a demand-driven approach – directing innovative efforts (both product- and process-based) towards the needs of customers on a market pull basis, rather than a technology push basis. One downside of customer orientation is that it can lead to incremental change with a focus on satisfying rather than anticipating customer needs. Again, AI can play a major role here if it embraces and includes the customer. This is fundamental to the nuanced training required for the successful implementation of AI-driven solutions, and being familiar with changing customer behaviours that are often motivated by climate-change imperatives.

"There is potential to capture better data, inherently generated through the use of digital technology to facilitate AI learning in the background."

Owen Williams, Manager Agtech and Logistics Hub

At the same time, digital solutions need to be adopted throughout different levels of the service ecosystem to scale impact and change. As noted by several experts at the roundtable, if a solution does not gain traction or become widely adopted, it is not a solution. In this regard, there is an increasing role for service providers to provide solutions through a deeper understanding of stakeholder value and benefits, built into an integrative solution potentially itself designed by technology. This requires a current fundamental barrier to be overcome: data limitations. Today, judgement is still made in the absence of current, reliable and accessible data that can be sufficiently analysed and integrated into future focused decision making. The challenge in capturing complexity to offer a viable solution requires a format that supports customers' co-design of future solutions.

Recommendations for policy and practice

In the new service marketplace – where environmental, social, governance and economic sustainability are equal imperatives – digital transformation is the innovative mutation on which natural selection acts to support or limit its adoption and longevity. Success is evidenced where new digital technologies are adopted and harnessed to balance short-term survival with long-term growth – at least until the next geomorphological event. Service firms, customers and policymakers should consider the following key areas to maximise the benefits of digital technology for sustainability.

1. **Deep learning AI plays a key role in balancing short-term survival with long-term growth, which is needed to achieve sustainability in an inherently dynamic service environment.**

2. **Experimentation with AI technology should be undertaken sooner rather than later to assess its relevance, appropriateness and value.**

   If you aren't playing with AI now, it may already be too late.

3. **As operational innovation is key, consider the digital solutions that may have greater impact for sustainable development.**

   Is it operational efficiencies, innovation, or a balance of the two that fits with and could enhance your business model?

4. **Service firms need to shift from operating as 'vertical siloes' to taking a broader 'ecosystem approach' where they collaborate with other stakeholders, including other service firms, to develop digital solutions to sustainability problems, while still being competitive.**

5. **The role of the customer in creating 'real' digital solutions needs to be considered.**

   To what extent should solutions be consumer co-created versus firm driven?

6. **Adopting digital solutions throughout different levels of service ecosystems is crucial to create impact and change.**

   How can data access, sharing, analysis and interpretation be optimised to better understand stakeholder value afforded by digital solutions, now and into the future?

Innovating together

Theme Leads: Martie-Louise Verreynne and Marta Indulska
Panel of Experts: Melissa Witheriff, George Feast, Nicole Hartley, Henri Burgers, Alexandra Kriz, and Selina Cao

The landscape of university–industry collaboration and the associated knowledge creation and sharing practices is profoundly changing. Australia is investing billions of dollars to improve the translation of research outcomes from universities into valuable offerings to markets and communities. Yet, collaboration between industry and universities lags behind other OECD countries, with Australia ranking in the bottom five of OECD countries on this metric. There is thus a need for system-wide changes to the innovation ecosystem, which is particularly pressing for service innovations that do not have a traditional path to market as is the case for other areas, such as drugs or food.

What are the challenges?

Our group identified challenges to university–industry collaborations focused on creating AI-centred service innovations. These challenges can be broadly categorised as follows: ecosystem issues (e.g. disparity of value propositions); organisational issues (e.g. resource shortages, technology development and adoption challenges, issues with customer-centric co-creation, and service blueprint); and collaboration-level issues (e.g. trust and risk, mindset and operational differences between parties, and culture change).

For collaborations to be effective between parties, with their often-competing logics, there is a need to orchestrate *system-wide changes*. Managing innovation ecosystems is complex, with the key question being how organisations can orchestrate their collective efforts to co-create something that can be of value to a broad range of participants. The numerous stakeholders and institutions across the ecosystem involved in the development and implementation of innovations may each have a different value proposition, and so system-level changes may be tricky. These challenges are further exacerbated in the context of AI-enabled innovations because of the need to share data while returns to participating stakeholders may not be clear upfront.

Because the businesses involved in collaborations are heterogeneous and have different levels of resources and capabilities, a set of organisational issues also emerge. For example, some businesses are limited by resource shortages to absorb and continuously embed innovations. This is particularly true for small businesses that may need help finding the right people to embed and constantly evolve their digital transformation, while also lacking the resources that are needed to build AI-related capabilities. In addition, the current economic downturn presents challenges for businesses to fund R&D and limits resources to invest in collaboration. Yet, to make university–industry collaborations work, we need shared minds and shared wallets.

Furthermore, because AI is deeply technical, an additional challenge regarding *technology development, adoption and monitoring* is present. When technical experts work with business to design AI systems, they need to ensure that they closely collaborate with the business – which are the domain experts – to develop an AI solution that adequately addresses the business problem and does so without unintended negative consequences (e.g. biases in training data). To ensure strong adoption of the resulting AI system, technical experts also need to ensure the system actions are explainable. Another issue is that AI models can drift over time, and thus model management becomes an ongoing task for which business may not have expertise.

Design often implies aspects of *customer-centric co-creation*, which, while powerful, has issues. While co-creation and the solutions that follow aim to understand what customers want, when it comes to technology (and AI in particular), customers may not know what is possible or even what they need. Likewise, there is a need to take time for technology experts to fully understand the processes and services that are being augmented or changed through AI implementation.

From a collaboration perspective, culture change for all parties involved is often required. Businesses may understand the value of collaboration but do not know how to change their culture to be more accepting of knowledge created elsewhere. This can be particularly challenging when the external knowledge is highly technical in nature, as is the case with AI, and the business lacks expertise to evaluate it. Universities may need to create legitimate career pathways to ensure that researchers feel safe to focus on industry collaborations that may not always lead to successful publication outcomes.

Similarly, *risk-fear mindsets* mean businesses want to know that solutions are proven before they invest in them. This is of course challenging with emerging technology, and especially challenging in the context of AI, given its dependence on high-quality data (noting that data quality is a common issue in business). It is important to understand that the degree of risk for B2B may be greater than for B2C in terms of the chance for financial losses if co-creation goes wrong.

One of the most challenging issues in collaborations is the *difference in parties' mindsets, operations, and goals*. For example, research organisations working with business on AI technologies have barriers in how IP is owned versus ongoing work needed to maintain AI algorithms. Questions may therefore arise around access, ongoing IP ownership, and training to use the technology. More generally speaking, for many businesses, R&D and day-to-day business operations is a trade-off. Additionally, organisations work at a fast speed while the research world works at a much slower speed; essentially, it can be a sprint versus a marathon.

What are the opportunities?

Similar to the challenges, opportunities were identified at the ecosystems (role of government in building systems, and providing support and access), organisational (business and university opportunities), and collaboration/project levels.

It is important to develop/design system-level solutions to support the timing, development and implementation of co-creation. The government has an important role to play here through tailored initiatives. At the organisational level, both businesses and universities have a range of opportunities arising from mutual collaborations. Businesses have an opportunity to introduce a range of changes, including reward incentives, and to allow employees to have time for an intellectual challenge, to think creatively, and have some fun. There is also a need to change the perception of the value of business and university collaboration, as done internationally, to see the university as adding value instead of being too theoretical. For universities, there are opportunities to solve the challenges of bureaucracy, which currently impede collaboration efforts, and to create interdisciplinary teams based on best practices. In this way, partnerships can break siloes to address more significant societal problems through sprints that take a deeply collaborative approach. Other opportunities come from boundary-spanning academics and other intermediaries finding technology partners to co-create with universities in the long term. The former is now creating new career opportunities for PhD qualified scientists, the so-called 'translational scientist'. Finally, a much better understanding of the motivators of collaborations is needed. This will help universities to get partners on board who have low trust and to build trust early on or find the first trusting partner to co-create and then demonstrate successes to others. At the collaboration or project level, there is a need to solve long-term versus short-term challenges associated with innovation. For this purpose, there is a need for a runway approach to understanding that we are building long-term solutions – for instance, an innovation hub – and that academics should come in at the optimal time (for example, for short sprints to develop/retrain AI models or study consumer adoption of the developed technology, which can be challenging in an academic environment). This will help to compromise differences in need- and urgency-driven innovation and help to prioritise a sense of urgency to free up capacity for AI, technology and innovation.

Pictured left to right: Assoc. Prof. Nicole Hartley and Dr Alexandra Kriz

Recommendations for policy and practice

As noted by David Goyeneche, "Academia + industry = bright future. As academics, we are in search of the answers to questions that nobody has asked before. The industry has questions, they have the data, and the empirical knowledge. Well, let's team up! Because together, we are the answer." To make this a reality, and considering the identified challenges and opportunities, we highlight four core recommendations for policy and practice:

1

Systems-level solutions need to be co-created by governments, business leaders and universities.

Government should provide more seed funding to support smaller projects between SMEs and universities to create a sense of urgency, similar to the CSIRO facilitating support for SMEs. Innovation clusters and similar larger-scale approaches can also be supplemented by targeted financial support and data sharing. Sharing data that can be utilised for AI systems, and other resources through creating data platforms, is vital to capture value from AI technologies. Especially for organisations building AI solutions, there may be an issue accessing data from government departments and disparate business sources. Solutions that pull together various data sources into an accessible format represent a big opportunity for value creation.

2

Consider the cultural changes needed, such as rewards and incentive structures, capability development, the development of a 'growth mindset' and space to think creatively.

Businesses should review their rewards and incentive structures to ensure they are geared toward prioritising capability and capacity development to enable innovation and cross-fertilisation between industry and academics; for example, by providing time, creating spaces, places and reasons for people to come together to engage in conscious collaboration. This will allow the development of a 'growth mindset' and prioritise training for people in diversifying thinking, and developing creativity while allowing for people from diverse backgrounds, both at the surface and deeper levels, to collaborate. This is especially important considering the need for both technical specialists and domain experts to work jointly to develop AI systems to ensure they reflect reality and are free from bias. This may include setting up short-term funding options for 'sprint' research projects to develop and test AI solutions. Universities too should make it easier for business and academics to collaborate. They can do so by developing umbrella contracts and thereby gaining advantages in terms of collaboration efficiencies. Universities should also create clear career pathways for academics focused on industry engaged research and create schemes that allow researchers to spend time in business to understand issues and co-create AI solutions. These may assist academic staff or PhD students to participate in short placements in industry to better understand business problems, available data, and to co-develop solutions. That raises the question of how you select the PhD students or researchers who would be interested in this type of role, which remains a challenge for universities to address. In this regard, looking at different ecosystems/countries where individuals move across industry and academia in terms of career paths more fluidly is recommended.

3

Business and universities need to take time to understand core needs and ways to mitigate risks.

In the context of emerging technology, customising and designing a good solution for one organisation may not be useful for another, which limits scalability. Yet, human-centred design matters. Collaborators may get excited about AI without understanding its utility (or lack thereof) for a particular business, so researchers should focus outside-in versus inside-out – i.e. take an outside-in perspective and understand the business need and potential market uptake/scalability as opposed to a 'build it and they will come' approach, which may pose risks in terms of commercial opportunities. Furthermore, any consideration of AI-driven service improvement requires an in-depth understanding of the process involved in the service. Indeed, the services marketing literature notes the importance of understanding each of the activities and perspectives involved in a process (e.g. manufacturing of a new technology > commerce platform it utilises for sale to resellers > end-user access and all steps in between). Such a service blueprint is important as we need to better consider what the 'pain points' and opportunities are in the process to leverage AI and get an edge on competitors. A lack of understanding of the service blueprint can lead to failures, while an acute understanding of the process can avoid negative unintended outcomes.

Therefore, successful collaborations need to be given sufficient time. Universities approaching businesses need to take the time to understand business needs, ensure alignment with their research interests and, therefore, build partnerships that are also relevant to partners. It is also important for both business and universities to understand how technology can be leveraged to minimise risk. For example, the metaverse could be utilised to develop an equivalent of a 'living lab' to allow collaborating partners to more frequently connect and interact. Last, we must co-create value and ensure everyone captures their share. businesses need to take the time to understand business needs, ensure alignment with their research interests and, therefore, build partnerships that are also relevant to partners. It is also important for both business and universities to understand how technology can be leveraged to minimise risk. For example, the metaverse could be utilised to develop an equivalent of a 'living lab' to allow collaborating partners to more frequently connect and interact. Last, we must co-create value and ensure everyone captures their share.

4

Digital literacy education needs to be available and easily accessible to business to facilitate quick up-skilling.

One of the motivations for business to engage in collaboration with industry is lack of technical skills and lack of resources. However, the characteristics of AI in particular, e.g. the potential for models to drift as more data is processed and 'learned' from by the system, necessitate ongoing monitoring that requires technical know-how. While business and university collaborations can be longer term and encompassing of such activities, thus going well beyond the deployment of the system, there is a need for processes and resources to be in place to embed skills/capabilities in the organisation over time, which implies up-skilling to ensure successful implementation. Universities have an important role to play in such up-skilling, through executive education offerings and other life-long learning initiatives.

List of **contributors**

- **Professor Tor W. Andreassen**, NHH, The Norwegian School of Economics
- **Mr Gordon Archibald**, KPMG
- **Dr Jenine Beekhuyzen**, Adroit Research
- **Dr Ivano Bongiovanni**, Business School, The University of Queensland
- **Dr Edgar Brea**, Business School, The University of Queensland
- **Associate Professor Christoph Breidbach**, Business School, The University of Queensland
- **Mr Keith Burchill**, A&K Marketing and Finance Advisory
- **Dr Henri Burgers**, Business School, The University of Queensland
- **Dr Selina Cao**, Australian Institute for Business and Economics, The University of Queensland
- **Associate Professor Len Coote**, Business School, The University of Queensland
- **Mr Brendan Coram**, Mantel Group
- **Miss Claire Cunningham**, Business School, The University of Queensland
- **Dr George Feast**, CSIRO
- **Mr Mitch Field**, Data#3
- **Dr Jerad Ford**, Worley
- **Mr Leon Fouche**, BDO
- **Dr Alexandria Gain**, Business School, The University of Queensland
- **Mr Glen Gooding**, Ernst & Young
- **Mr David Goyeneche**, Business School, The University of Queensland
- **Dr Teegan Green**, Business School, The University of Queensland
- **Mr Daniel Gschwind**, Trade and Investment Queensland
- **Mr Thomas Hall**, AgriBusiness Connect
- **Associate Professor Nicole Hartley,** Business School, The University of Queensland
- **Mr Daniel Heinz**, Karlsruhe Institute of Technology
- **Professor Damian Hine**, Queensland Alliance for Agriculture and Food Innovation, The University of Queensland
- **Professor Marta Indulska**, Business School, The University of Queensland
- **Mr Brett Kapernick**, Manufacturing Futures
- **Professor Tim Kastelle**, Andrew N. Liveris Academy for Innovation and Leadership, The University of Queensland
- **Professor Ryan Ko**, School of Information Technology and Electrical Engineering, The University of Queensland
- **Dr Thomas Kohlborn**, Deloitte
- **Dr Paddy Krishnan**, Oracle Labs Australia
- **Dr Alexandra Kriz**, Business School, The University of Queensland
- **Mr Jason Lowe**, Oracle
- **Dr Samuel C. MacAulay**, Business School, The University of Queensland
- **Professor Paul Maglio**, UC Merced, University of California
- **Dr Thomas Magor**, Business School, The University of Queensland
- **Associate Professor Judith Mair**, Business School, The University of Queensland
- **Mr Sandeep Mathur**, Transport for New South Wales
- **Professor Janet McColl-Kennedy**, Business School, The University of Queensland
- **Mr David Nagel**, Caterpillar
- **Mr Shane O'Kane**, Ernst & Young
- **Dr Anne-Maree O'Rourke**, Business School, The University of Queensland
- **Dr Sandra Pavey**, Health and Wellbeing Queensland
- **Ms Therese Phillips**, Tourism and Events Queensland
- **Dr Marten Risius**, Business School, The University of Queensland
- **Professor Brent Ritchie**, Business School, The University of Queensland
- **Associate Professor Richard Robinson**, Business School, The University of Queensland
- **Mr Joshua Scarsbrook**, School of Information Technology and Electrical Engineering, The University of Queensland
- **Dr Felix Septianto**, Business School, The University of Queensland
- **Ms Rebecca Sigrist**, Oracle
- **Ms Anshu Sisodia**, A&K Marketing and Finance Advisory
- **Ms Amanda Smith**, BEL Research Partnerships, The University of Queensland
- **Dr Jan Sobus**, Caterpillar Australia
- **Professor David Solnet**, Business School, The University of Queensland
- **Mr Grant Statton**, Innovation and Energy, FKG Group
- **Dr David Stockdale**, School of Information Technology and Electrical Engineering, The University of Queensland
- **Mr James Tarbit**, Business School, The University of Queensland
- **Mr Damian Vassalo**, Honeywell
- **Professor Martie-Louise Verreynne**, Faculty of Business, Economics & Law, The University of Queensland
- **Mr Owen Williams**, Agtech and Logistics Hub
- **Ms Melissa Witheriff**, Avanade
- **Dr Hongmin Yan**, Griffith Business School, Griffith University
- **Ms Jing Yang**, DLTx
- **Ms Wenlu Zhang**, School of Information Technology and Electrical Engineering, The University of Queensland

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Pictured: Prof. Paul Maglio

Business School

Service Innovation Alliance Research Hub
Level 4, Colin Clark Building
St Lucia Campus
E engage@business.uq.edu.au
W business.uq.edu.au/service-innovation-alliance

Professor Janet McColl-Kennedy
E j.mccoll-kennedy@business.uq.edu.au

Associate Professor Christoph Breidbach
E c.breidbach@business.uq.edu.au

Connect with us

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