Roadmap to Inclusive Leadership and Agility

FREE CHAPTER

BUSINESS MODEL TRANSFORMATION:
The AI & Cloud Technology Revolution

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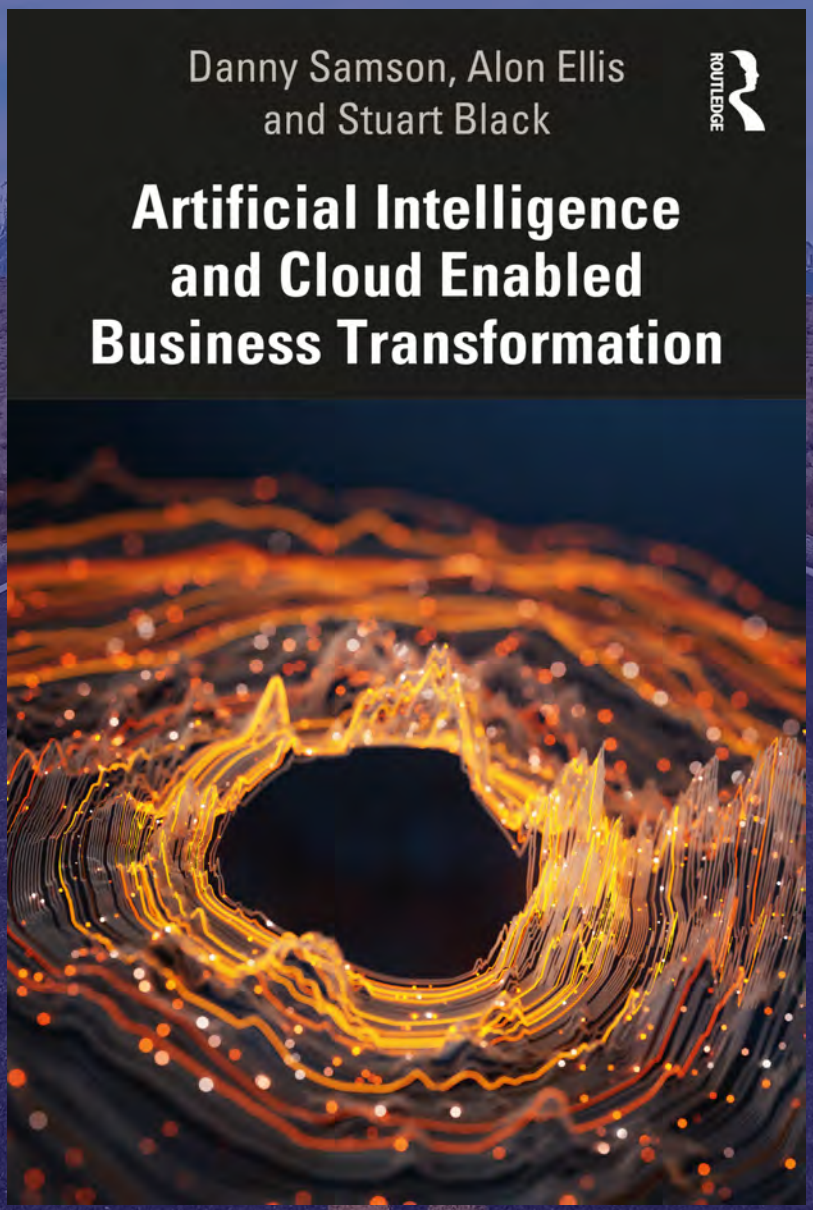

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INTRODUCTION TO AI/CLOUD-ENABLED BUSINESS TRANSFORMATION

The opportunity

The invention and deployment of new technologies have been providing organisations with competitive advantages, when they are successful, for many hundreds of years, and some would argue for many thousands of years. Early technologies seem very unexciting in today's context, yet the same principles of technology-based advantages have existed for a long time. A very simple early example is the wheelbarrow, that gave its originators, some 2,000 years ago, significant productivity advantages, whether for commercial or military purposes, for efficiently distributing goods with higher productivity rather than simply carrying them. The ancient Egyptians developed paper and writing, levers and pullies, and core sciences including mathematics, geometry, medicines and astronomy, that spurred all sorts of new technologies and products. The ancient Greeks developed and deployed numerous types of technologies including machines with gears, bronze casting, and the use of steam. More recently, the agricultural 'combine harvester' increased farm productivity manyfold, releasing large proportions of workforces to engage in other forms of industrial production. To think of harvesting wheat or similar grain at scale without such mechanisation in a modern economy is nonsensical, because of the advantages that such technologies bring. More recently, low-cost robots, 3D printing and a raft of information and communication technologies (ICT) have led to both evolution and transformative revolution of manufacturing industries, supply chains and their participants.

Similarly in service sectors, that now comprise the bulk of our economy, new technologies related to ICT have bloomed in the past 50 years, and particularly in the past 20. In organisations that process a lot of information at their operating core, Robotic Process Automation (RPA) has developed in recent years as a set of software automations that can act as 'bots to replace human effort in routine

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process steps'. *CIO* magazine reports on a bank that deployed 300 bots to handle 1.5 million requests per year, being the equivalent of 200 employees, at 30% of the cost.[1] Such instances are from a business perspective, not unlike the advantages that came from mechanical harvesting in fields that replaced human workforces, or containerisation that improved logistics productivity in transport sectors. Intelligent automation, that can go much further than RPA, has much to contribute to the future of service sectors, through adding cognitive reasoning power to RPA or other processing capabilities, using machine learning and other approaches that bring value creating and competitive advantage.

The rise of the modern business organisation in the past 200 years has led to tremendous breakthroughs in ever advancing technologies that serve markets and consumers, hopefully at a profit. Many of these developments were deployed as products and service innovations. They needed quite sophisticated organisations to resource their scaling up and deployment. Millions of lives have been saved by penicillin, not just because it was invented, but also because it was able to be mass produced and distributed to where it could be effective. The COVID-19 vaccines are a very modern example of significant innovations that aim to solve a global problem.

Innovation brings advantages when inventions are effectively harnessed, find a market and are deployed at scale, and the other side of the coin is that in competitive markets, where there is relative advantage, there is also relative disadvantage. An extreme example was of a world-leading, well-branded photographic equipment company called Kodak. From cameras to photographic paper to chemicals and processing centres, Kodak was a global player in manufacturing and services, yet was run over by its failure to embrace the technological shift to fully digital photography. This, meaning going out of business completely, was indeed transformational for Kodak and all its stakeholders!

The rise of information technologies (and the capabilities they bring)

Prior to 1970, most innovation was considered to be related to new products, and some attention was given to new processes of manufacturing. Examples abound such as the steam engine, the internal combustion petrol engine, electricity, the jet engine, and genius process innovations such as line flow manufacturing and assembly and standardised shipping containers: these famous examples all are characterised by their high degree of tangibility; they are physical products or the means of producing them.

We note that as factories and distribution systems became ever more efficient, during the past 200 years, consumers have been increasingly able to exert demand for pure services, being intangible consumption items. Major growing service industries include tourism, health and education, yet there are now a myriad of services available and new ones gaining popularity all the time, such as in the past decades, personal coaches for executives, personal trainers, information and media services,

online entertainment and gaming, and a host of pure services from accounting to home food delivery, cleaning and gardening, that households and business now outsource. Many of these services are partly or substantially enabled by information systems. Business outsourcing has grown a great deal this century, also enabled by information systems.

Computing and information systems that became useful on a broad scale around 50 years ago have helped to facilitate such services growth. A bank CEO once told us that if not for computers we would need every person in the workforce, just to process the volume of transactions that underpins our exchange economy. Indeed, over the past 30 years, much of the gain in productivity in OECD economies, that is occurring very much now in developing economies, is the result of information-systems-based improvements within and between organisations. The early breakthroughs were of fast calculation at scale, efficient storage and retrieval of data, and then from 1980, computers and information systems (IS) became themselves transformed into ICT systems, through electronic networking and then the internet. We are now in the age where certain decisions, such as in particular types of bank lending and insurance underwriting, can be more effectively made by computers (software algorithms) than humans. Furthermore, many of the applications that make such decisions have developed over time, with the applications continuing on well past the time that their original programmers retired.

With the platform technologies that are rapidly developing, new services that made effective use of computing power developed fast. Outsourcing became a big 'thing' and it can be argued that just as containerisation in shipping facilitated global product outsourcing and trade growth, the internet led to global services outsourcing. Australian banks, telcos and indeed anyone were able to move their back office to anywhere in the world and achieve significantly lower costs (and sometimes better service). Architects and engineers could specify and design structures in Australia, then get the necessary detailed work done overnight on the other side of the globe at low cost. Many services providers found that if they did not engage in such activities, they were at significant relative disadvantage. Global outsourcing became efficient and as widespread as global product sourcing, thanks to ICT capabilities.

Business model innovation

Technologies and business/market forces that seek ever more advantage move fast and are highly dynamic. Whereas innovation was mostly about products a century ago, and significantly about services more recently, to this we must now add business models themselves. By business model, we mean the very structure of a business and how it survives and prospers, including its assets, processes and products/services, its competitive positioning, and its means for attracting customers, generating revenues and incurring costs, its distribution channels, as well as its relationships with suppliers and ecosystem partners. In the international best practice chapter of this book, we describe how Rolls Royce 'servitised' its jet engine business, moving

from selling engines and hardware to selling and servicing/maintaining engine propulsion 'by the hour'. Similarly, we trace Netflix's evolution, or perhaps more correctly revolution, from DVD distribution (using 'snail mail') to Cloud-enabled streaming service and content producer. These and other transformations could not have happened effectively without modern technologies, especially AI and Cloud. They give powerful evidence, as do our other international case studies (see Chapter 4), of DBS Bank, Samsung and Bank of America of how Cloud and AI can enable highly valuable transformations.

Many highly innovative new business models have been created this century, notably Amazon, Uber, Airbnb, Facebook, Google, and a host of others. It is instructive to briefly examine what they did that was innovative, and what was kept the same as in conventional offerings.

1. Amazon began selling books online, needing to draw on and enabled by the internet, electronic payment systems and postal physical distribution systems. It could profit from a superior cost structure, offer a wider range and convenient delivery and extend its services. For example, it provided book reviews and data-informed customised purchasing recommendations, such that traditional companies such as Borders were left in its dust. What worked for books at Amazon, quite quickly moved and extended to just about everything else! Further new businesses and business models were added, including third-party selling, Cloud services and many other offerings. Interestingly, what did not change with Amazon book sales was the actual book (until Kindle was developed)! Same 'book' product, different ways of getting it, additional services that go with it, and clearly the market has spoken: just ask Borders ex-shareholders. Amazon makes extensive use of advanced ICT, especially AI and (its own) Cloud.
2. Uber created a network effect of personal transport offerings, and while Uber and its competitors have grown dramatically, the service is not that different to long existing taxi services, and the use of a vehicle to transport people as a service is certainly over 120 years old. Uber's business model relies on advanced ICT and could not exist without it. Pure ridesharing goes even further: where Uber uses paid drivers, pure ridesharing uses ICT to connect regular drivers of vehicles with those needing a ride in real time, offering obvious cost advantages.
3. Airbnb uses ICT to create a market for casual rental of accommodation, and what is new is the business model of how demand and supply is efficiently connected online, using existing accommodation assets that are indeed not new. It's a pure business model play, now competing with and dwarfing the capacity of the world's largest hotel chains.
4. Apple revolutionised many things, including how consumers accessed music and video content through its online distribution service iTunes and then AppleTV. Others (such as Spotify) have also further innovated here. Music is still music, as are movies, and consumers still want to listen and watch as before.

Blockbuster once employed over 80,000 people renting videos on tapes and is no more.

5. Dell Direct entered a tough competitive industry and allowed customers, first business then retail consumers, to buy customised PCs and peripherals online, have them assembled-to-order quickly, and delivered with pre-loaded software to their consumers within days. Dell's market entry with this innovative business model gave the industry a significant shake, with entrenched participants such as IBM, Compaq, HP and others restructuring in attempts to respond. What was different was the innovative business model of a customised 'make-to-order then deliver' approach of Dell, and what was not really different was the actual computer and what it could do.

It is interesting that the examples above and many others like them are of new businesses, or in Apple's iTunes case, a new industry for it to come into and dominate. Why didn't Blockbuster, at the height of its powers, invest in renewing its services and business model? Same for Kodak. Is there a 'curse of incumbency', or at least a significant inertia that makes it hard or uneconomical for companies with existing and successful operating models such as Borders, to be highly innovative, or even, once it sees the writing on the wall, to be a fast follower? Are incumbents 'blind' as a result of their real-time success, to potential transformations? This then leads to the question of how many and which of our major operating companies in Australia, which are often significantly profitable and sometimes exist in the cocoon of cosy oligopolies, are ripe to be knocked over by those which have superior business models. This question is especially pertinent at a time of Industry 4.0 inception, where powerful technologies such as AI and Cloud bring opportunities for those who can effectively deploy them. Such threats can come from international companies who have already moved down the path of such advanced technologies, or in the present world where capital is cheap, from start-ups.

The potential threat for Australian incumbent companies that do not invest, or that underinvest in technologies that keep them at the cutting edge of cost, quality, service and delivery performance are at least threefold:

1. Start-ups will pick off their profitable segments, niches and service lines, leaving them with 'the rest'. Start-ups have the opposite of the 'curse of incumbency', and often are risky propositions themselves, but for those that succeed, it's a case of 'incumbent beware!'. Start-ups don't generally have the inertial drag of legacy systems and old-world culture that can dog the incumbents.
2. New product categories that threaten incumbent's markets, such as Afterpay and ZIP's foray into purchase financing that takes market away from credit card issuers, and Bitcoin that offers an alternative payment system. ZIP and others are further developing these alternatives from retail purchasing to corporate procurement platforms.
3. International incumbents that have invested in technologies beyond our local businesses, and therefore may have cost/quality/delivery (CQD) advantages,

underpinning better value propositions can enter Australia, with our relatively high disposable incomes, oligopolies and solid profit margins, and even some lazy balance sheets, and either through acquisition or organically, can challenge existing players. For example, what would happen if Walmart chose to aggressively bring its capabilities to Australian retailing? Costco, Amazon and Aldi have done so in relatively recent times, but as yet it can be argued that these have become niche plays, with less than 20% market share. Walmart has invested heavily in new technology, has a global footprint, and presumably at some point will notice the small but profitable niche 'down under' and bring its cost structure and AI and Cloud-based intelligence to our shores, along with its global supply chain power, that dwarfs that of local companies.

While we observe these three categories of threats as very real, we note that they are far from 'sure things' in any category. For example, foreign banks have entered Australia on previous occasions, mostly without success to date, especially when they attempted organic growth.[2] Other large multinationals have entered the Australian market only to exit after being unable to attain the necessary critical mass. Furthermore, we have seen the exit of the major automotive OEMs (Original Equipment Manufacturers) from Australian shores, when those OEMs determined that other regions in the world offered better options for their capital. Yet clearly for Australian incumbents, the best defence against the three categories of attack described above, is to drive CQD (Cost-Quality-Delivery aspects of value creation) hard, striving for international best practice levels of performance, and embracing any new technologies that can transform them towards achieving improved competitiveness. Further beyond pursuing CQD improvements in their existing operations, comes the big prize of innovation in their business models that technologies such as AI and Cloud can bring. Walmart and Amazon are investing significantly in highly automated AI-enabled retail stores, that drive service offerings, food freshness, stock and supply chain efficiency and productivity. It is certainly a challenge that Australian retailers should not ignore, and many similar examples exist in other industries.

Looking back and looking forward at ICT

Through briefly reviewing some elements of the history of ICT and innovation progression as described above, we can observe with the wisdom of hindsight, how innovations were initially in tangible goods, then services, and more recently in the use of ICT to create and enable new business models. From the early days of unsophisticated information networks, both public and proprietary, innovations have led to E-commerce, E-business, and a range of technology platforms. Cost structures were shattered. For example, the commission fees for buying a parcel of shares in the 'pre-internet' world was 1.5% for retail consumers, i.e. broker fees were $300 for buying or selling $20,000 of shares. When online straight through processing directly connected buyers and sellers to the market more efficiently and

speedily. Transparency increased markedly, and share brokers were disintermediated because the transaction fee was reduced from $300 to $10, i.e. a 97% drop! That was certainly an early case of ICT-enabled radical transformation.

Looking forward, the technological capabilities have continued and, in many ways, accelerated. Moore's Law has guided us to understand the large and continuing increases in processing capacity at lower costs. Huge amounts of data are generated in businesses and economies, and with electronic transactions and increasing uses of sensors of all types gathering data (from video cameras to RFID, Internet of Things and other sensors), opportunities arise about how such data can best be used to create business and consumer value. This is where and how the next set of promising technologies, principally Artificial Intelligence and Cloud computing/processing, are coming to fruition this decade. This begs the question of how business models can best make use of such capacity. From raw data, adding some intelligence can produce useful information, leading to more effective decisions, when it is effectively harnessed. For example, one of our case study businesses in this book, Kogan, has developed a machine learning capability that offers highly customised offers to millions of people in Australia every day, without any physical storefront. Whereas a physical storefront is standardised for every person who walks in, Kogan's sophisticated data analytics and AI provides a unique storefront to each potential customer, based on large amounts of data.

Innovation in business models: how and what?

There are many ways to formulate candidate business model innovations. The Doblin approach has proved useful to many executives when considering innovation opportunities and choosing which aspects of their business model they should transform. It categorises business model innovations as where a business leadership team can change/transform potentially any of:

1. *Profit model*, changing market segment and price point, or moving to a subscription model, charging membership fees, creating a network or switchboard, selling by auction, letting customers set or offer prices, offering some services for free, flexibly pricing, financing, licensing, bundling, disaggregating elements/features, and various risk sharing or allocation mechanisms.
2. *Network innovation*, involving merger/acquisition, open innovation, consolidation, alliances, partnering, supply integration, franchising, coopetition, or other forms of connection and collaboration.
3. *Structural transformation*, including uses of incentives, transforming organisational design, IT integration, outsourcing, centralising or decentralising, standardising, or creating centres of excellence, using knowledge management or competency centres.
4. *Process transformations*, including operating process standardisations, localisation, offshoring or onshoring, flexible production, mass customisation, crowdsourcing, on-demand production, lean systems, co-creation of services

with consumers, intellectual property, logistics changes, and use of predictive analytics.

5. *Product transformation*, including superior product specification, ease of use, safety, feature aggregation, simplification, additional functionality/features, environmental sensitivity/performance, recycling/conservation, design styling, niche focus.
6. *Product system*, including adding complementary offerings, bundling, including services, modular product, platform approaches, and integration of services.
7. *Services*, such as guarantee, free trials, loyalty initiatives, leasing, solution provision, self-service, and ongoing or superior services.
8. *Channel*, including direct-to-consumer, flagship outlet, innovation of store design, pop-ups, third-party marketing/sales/distribution, cross-selling, make-to-order auto-replenishment.
9. *Brand repositioning*, such as co-branding, sub-branding, leverage across categories, certification, private label, showcasing.
10. *Customer partnering*, including customer task simplification, duration, disintermediation, supply chain repositioning, mastery provision, personalisation, network creation.

This set of items above is not an exhaustive list (although it may seem exhausting to the reader), but rather a showcase of many of the main ways in which innovative transformation can be attempted. This begs the question as to how such potential transformations, from relatively minor (but still transformative), as against incremental, to 'heavy transformations' can be enabled by technology choices such as AI and Cloud. Here is perhaps the central point of this book, that the potential for transforming any aspect, as listed above, of a business should be considered first and then connected to the power that can come from technologies. Some transformations will only be possible with the use of technologies. Some do not need advanced technologies at all, and indeed are such that the cost of implementing technologies would exceed the benefits. Therefore, we suggest that the use of technologies such as AI and Cloud should be considered in terms of their value-creating potential for any contemplated transformation.

Further, some innovative transformations will not only be more effective when they are 'tech-enabled' but will also be infeasible or ineffective without the technologies. That infeasibility might be technical or economic, or both. The most important high-level point is that without technology as a potential enabler, the types and sets of transformation options will be more limited than with those technology enablers in place. Further, for some of the specific transformations that executives might be considering, the degree of required tech-enablement can vary from small or even zero, to overwhelmingly large and indeed necessary. For example, repositioning existing offerings to a different market segment, and changing price point and volume may not necessarily need advanced technology, unless it brings cost advantages for example, but on the other hand, going from a mass-produced standard product or service to a mass-customised, highly

personalised service may well require Cloud capability, and AI enablement (think Kogan and Netflix). Machine learning might be effective in making personalised recommendations to customers as an enabler of moving to a differentiation position in a financial services sector, or in offering 'fitted' customer suggestions as to specific holiday packages in the tourism sector. Such is less likely in the commodity end of each of those markets. This is where we can observe that 'technology push' enablement capability, needs to be well fitted to the 'value proposition pull' of the proposed transformation in market requirements planning.

What can new technologies do, disrupt, add value to, and what are their limitations?

Industry 4.0 is a term often used to describe the fourth industrial revolution of which AI and Cloud are key elements. In this book we focus on business models that can be transformed when enabled by these new technologies, meaning we focus on incumbent companies rather than start-ups. Building a new business from scratch or close to scratch is, by definition, not truly a transformation. Incumbent companies often have brand equity, customer base and goodwill, significant assets and physical resources, and a workforce. These elements can be either great assets, or else when significant transformation is called for, liabilities dragging against progress. Perhaps this is why so many examples exist where 'creative destruction' is brought to industries by new companies that disrupt the old equilibrium.

For executives working in existing firms being wary of start-ups (e.g. major banks being wary of fintechs), it is of great importance to understand the business implications and opportunities of new technologies, as an input to strategy making and transformation. C-suite executives and those who inform and support their decisions should be able to understand enough about what their technologies and engineers are able to provide, so they can formulate strategies that make the most out of market opportunity and matching technical enablement. If new technology is seen as a completely opaque black box by senior executives, how can they really know its innovative capabilities? We hasten to say that senior decision makers need not know the details, but should be literate, as against illiterate, in having an accurate high-level view of what technologies such as AI and Cloud can, and cannot, do, where they are powerful and in which directions they are developing.

How new technology has created new challenges and opportunities for business model innovation

Technology has continually driven change in customer value propositions, market structures, and consequently, organisations. As each decade has gone by, innovations in computing power, networking, core business systems and digital interfaces, have transformed the way that we all do business. Over the past ten years, this has resulted in the elevation of various technology roles to the C-suite, e.g. Chief Technology Officer, Chief Data Officer, Chief Analytics Officer. This elevation reflects a

recognition that the effective use of data, information and related technology is critical to the future success of an organisation.

Despite these recent elevations, the way in which 'the business' interfaces with 'the technology team' is still evolving, and often problematic. The gap between business and technology functions is a recurring theme in many organisations. This book seeks to create some common language and a set of principles for the business to identify and lead the critical innovations for which technology support is required. We aim to provide clarity for how business leaders can drive benefits from technology. While there are many efficiency gains to be had through a range of technology innovations, e.g. automating an existing process, genuine innovation of a business model must come from changes in the way the business operates.

To that end, we believe that business leaders must have a working knowledge of the critical technology building blocks, so that they can practically understand the ways in which technology will disrupt the markets in which they operate. Over the past 20 years, the job of investing in information technology (IT), has primarily been the responsibility of the IT leadership group, whether that technology was needed for delivering 'table stakes' capabilities, or for a genuine competitive advantage. In order to generate material and sustained competitive advantage, we believe business leaders will need to proactively bring forward potential IT-powered innovations, ideally in a co-development process with their IT counterparts. Put in simpler terms, there needs to be a recognition that not only will business strategy inform technology choices (as has always been the case), but also that emerging technology capabilities should create new strategic options and pathways for a business to transform. We have listed a high-level summary of these technology evolutions in Figure 1.1. Looking forward, we suggest that all business leaders should assume that rapid further changes and transformation potential will continue, and perhaps accelerate!

One of the inhibitors of technology innovation and technology investment has been the relatively low success rate and challenging business cases for typical technology-led change over the past 20 years. Countless organisations have

1970s	1980s	1990s	2000s	2010s+
Core systems come into existence	Technology becomes widely accessible	Databased & connectivity gain momentum	The Internet era begins	Cloud, AI & the growth of new devices
• Mainframes • Distributed terminals • Core computing	• Office computing • Mini-computers • Word processing • Spreasheets • Home computing	• Network computing • Email • Relational databases • Client-server applications	• The internet revolution • Increasing consumer engagement • Intranet development • Widespread broadband	• Cloud computing • Big data platforms • Deep learning & AI • Mobiles, tablets & wearables • Social media

FIGURE 1.1 A high-level summary of 50+ years of ICT developments

announced large scale technology transformations, only to find that after several years and $100 million plus budgets, they receive little benefit and face painful feedback from analyst commentators and shareholders. Such history creates a 'I'll believe it when I see it' attitude amongst key stakeholders, which creates headwinds for these initiatives. An alignment between business and technology on what specifically needs to be done differently to innovate the business model is critical to the success of these investments. To deliver this outcome, more business leaders need to provide a business-led view on how technology can help them drive change, together with confidence that they are likely to deliver future vision they have painted for their investors. This requires knowledge of what is possible, together with a practical understanding of why the transformation is likely to be delivered on time, and within budget.

What's different with AI and Cloud technology?

Before the growth of AI and Cloud technology, each organisation would need to install and manage its own software, on its own, self-maintained hardware. Technology vendors designed their own solution stacks, which provided a base level of capability, which was often customised. Those customisations created a competitive advantage and were often perceived to be an asset to the business. AI described a set of algorithms that could be developed and run using specialised software, run on expensive hardware, programmed by even more specialised statisticians and research specialists.

Over the past 15 years, the process of developing and deploying a wide variety of AI models has become simplified through improved software interfaces, automated algorithm development, and a dramatic increase in the number of people who are trained in the relevant model development skills. In parallel, a set of emerging algorithms (which we will explore in detail in a later chapter) have enabled machines to classify, predict or simulate outcomes in a way that clearly surpasses human capability. This nexus of machine capability and human capability is often recognised as core to success. Key questions are of what tasks and activities can machines do better, and which can humans still do better, with this being a moving interface, since machines are getting smarter and more capable every year! Further, how can a business best be rebuilt to most effectively take account of rapid improvements in automated processing and machine-learned decision making, alongside human capabilities? This is no longer the stuff of science fiction: businesses such as Bank of America have rebuilt themselves based on astutely and correctly deploying answers to these challenges (see Chapter 4).

In parallel, the development of Cloud-based technology (i.e. technology 'born in the Cloud' and accessible via the internet), has forced technology vendors to innovate and collaborate. Monolithic platforms have been replaced by composable architectures, which allow businesses to connect a variety of building blocks together, to create a much more tailored solution. In particular, the creation of Platform-as-a-Service (PaaS) solutions, which provide hardware and a configurable

environment with a wide array of end-to-end capabilities on a scalable platform, have dramatically reduced the required skill levels and investment cost, for building and deploying advanced AI solutions. These solutions provide pre-built libraries of statistical models, interfaces, and much more user-friendly tooling that dramatically commoditise 'infrastructural technologies'.

These developments have led to the frequent use of the term 'technical debt', to describe the process of IT customisations and bespoke coding, going from an asset and competitive advantage to a liability and burden for the business. Companies that adopt open, Cloud-based technology, tend to have less technical debt, in addition to the increased agility that comes from accessing best practice services and technologies. This set of opportunities should not just be considered for larger businesses, e.g. from ASX100: one of the exciting AI/Cloud-enabled transformations described in this book is of a family company, Canningvale, that moved from wholesaler (mostly of bed linen) to Cloud-based retailer, capturing a much larger slice of the value-add in its value chain. ICT, specifically Cloud, was core to its transformation, and value-added AI going forward would allow it to add even further value in a Netflix-like or Kogan-like way to its customers, via intelligent product suggestions, price optimisation, and better demand prediction and management.

These changes have created new avenues for differentiation, and new solutions to previous problems:

- *Can't connect with the end-consumer?* Cloud platforms, in combination with AI technology, dramatically reduce the cost of direct-to-consumer digital interfaces. These technologies have enabled Formula 1 (racing) to sell its media direct to consumers.[3]
- *Don't have data about the external market?* A broad range of third parties now provide a wide range of data, at highly granular levels of detail, sometimes with real-time integration. This is what enables businesses to confidently launch in new markets they hadn't previously operated in.
- *Don't have data about your own operations?* Service providers now provide data from their operations as a value-add, while machine learning techniques are commonly being used to infer process information based on 'data exhaust' from transactional systems.
- *A computer can't do that?* Off the shelf Deep Learning algorithms are now more effective at diagnosing tumours than a doctor and are probably better at reading their handwriting.

These examples are a small subset of the ways in which organisations are working through a range of previously intractable problems, which would otherwise have stopped or significantly increased the cost of some of these business model innovation opportunities. They are also examples of why traditional incumbency advantages are fading away in so many industries. The dynamism and turbulence of new business applications of new technologies such as AI and Cloud mean that business strategies have a shorter shelf life and if left unattended, will increasingly

'date' within a year or two. The 'good old days' when business strategies and plans were devised to last over five-year or longer time horizons now seem laughable in many instances. This new, tech-enabled dynamism and turbulence brings opportunity, and of course, threat. Having strong market share and brand used to be a highly protective asset: no longer is that the case.

Why AI and Cloud? Why not other disruptive technology?

A critical decision when updating any strategy, is defining the boundary of what should or shouldn't be considered for change purposes. The authors of this book are firmly of the view that the combination of AI and Cloud technologies have created a unique opportunity for market disruption and business model innovation. We have also chosen to draw the boundary at this point, without including other disruptive technologies.

When compared against a range of other technologies, AI and Cloud technologies (together with the advances in networking and Application Program Interfaces [APIs[4]] to simplify interconnection between technologies and data) each have far greater applicability across a broader range of sectors, are more ready for commercialisation, and most importantly, have a greater ability to differentiate the way in which an organisation serves its customers, i.e. they provide innovations that can drive a material level of competitive advantage.

Over the last 10 years, the growth of PaaS in particular, have provided a wide range of capabilities that accelerate the development and application of AI solutions. These innovations are one of the primary reasons why machine learning solutions have become much more commonplace, as the barriers to development have reduced (see Figure 1.2). They have also provided a far wider range of advanced algorithms, which often come 'pre-trained', and avoid the need to provide very large and often costly training datasets.

For all these reasons, we believe that AI and Cloud technology provide both an opportunity and a threat to incumbent organisations, which executives and boards need to tackle head-on. In a later chapter, we will provide greater detail on the ways in which these technologies allow organisations to serve new markets, in ways that they were previously unable to do.

AI: some development directions and limitations

In December 2020, panels of experts gathered in Montreal[5] to debate the future of AI where some fascinating points were made as the sharpest AI experts peered into the future:

1. Deep learning is far from the end point of AI; indeed AI has a great deal of further development potential in front of us. Deep learning was reported as a great point of progress, but still requires a lot of data, lacks generalisability across applications, and is not a reasoning-based approach.

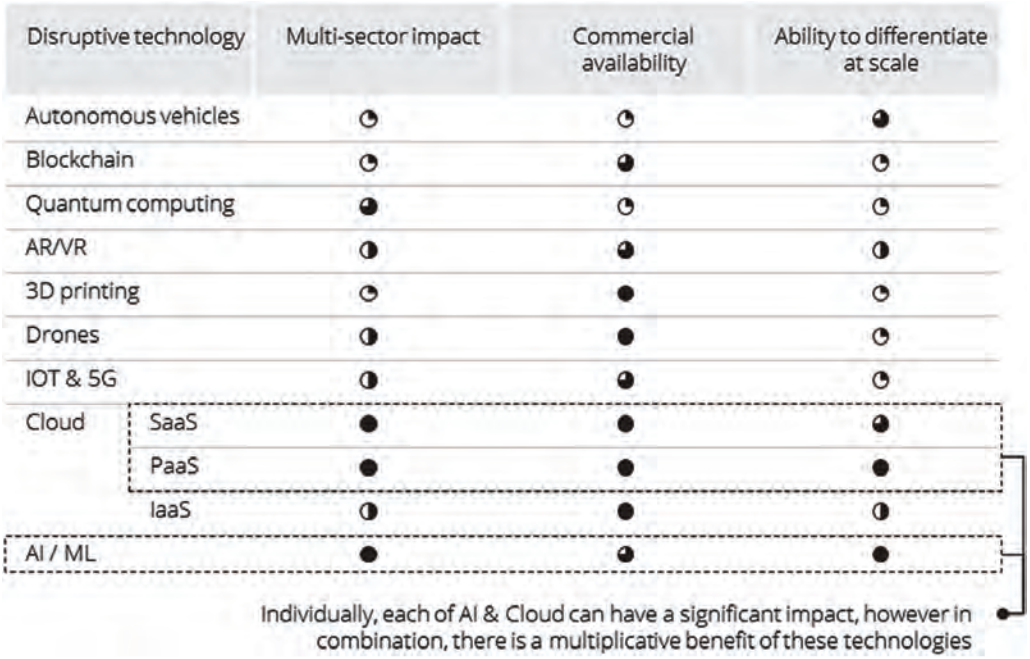

FIGURE 1.2 Potential disruptive technologies for consideration

2. Hybrid approaches that combine algorithms with rules-oriented software were seen as a next development field within AI, improving its interpretability, trustworthiness and clarity in application. Combining logical reasoning with deep learning seems promising.
3. Much of AI is currently substantially limited to acting on human-curated data sets, with new developments being where algorithms and perception actuators can facilitate their intelligent interaction directly with the world at large.
4. AI was recognised by experts as missing what are essentially human capabilities of common sense, still unable to fully exert and use knowledge, to which we would add that innovation and indeed business model transformation is still a human activity, requiring lateral thinking, much more than deep learning.
5. Yet AI steams forward in its capabilities, and as it becomes more cost-effectively available, including with thanks to Cloud, its use in combination with human capabilities continues to evolve. AI can unquestionably be superior to using pure human capabilities in highly structured tasks, with growing ability to move towards richer and less fully structured applications coming, fast.

How widely are these technologies being applied?

Many surveys are undertaken of practices and intentions in deploying new technologies. *Forbes* magazine reported on Algorithmia's 2021 survey[6] of over 400 business leaders of major businesses, with headline findings that:

1. 83% of enterprises increased their budget for AI in 2020, over 2019, including 20% that increased these budgets by over 50%.
2. 10% of businesses currently use ten or more AI applications.
3. Chatbots, fraud analysis and process optimisation were common application areas. These volumes are similar to reports from other studies, for example Salesforce' 2020 study found that 69% of enterprises report that AI is transforming their business.
4. The demand for data scientists is growing at high double-digit rates with 29% of major enterprises already having over 100 such people working on development initiatives.
5. Half of major organisations are using AI to deal with fraud, expected by most to increase.

In business value creation terms, AI went almost nowhere for 50 years since its first serious conception in 1955, and in the past decade, and particularly since 2015, it has really jumped forward, partly because of the Cloud capability now in place that complements it and increases its return on investment! There was indeed only a small prospect of AI creating significant business value when computing in general and telecommunications capabilities were immature. Everything from data processing capabilities through to real-time distributed systems have now advanced to where AI is at last able to deliver business value, as evidenced by the investments referred to in the survey findings above.

Where our findings differed from the conventional wisdom

As we began this research, the authors came in with a set of viewpoints, developed across a broad mix of experiences in industry, consulting and academia. As we have furthered our understanding, a range of findings appear to contradict the conventional wisdom on a variety of topics.

Topic 1 – The pathway for AI and Cloud adoption

The conventional wisdom would suggest that the best approach, is to develop a series of proof points, which allow the organisation to build confidence in the potential (and manageable risk) of these technologies.

There is nothing wrong with pursuing initiatives with near-term benefits. However, undertaking a series of proof-point and limited deployments seems to be answering the wrong question – that of '*how might these technologies benefit our organisation?*'. It can lead to incrementalism: that can become a debilitating limitation. Additionally, a carefully sequenced development approach which primarily learns only from the organisation's experiences, is likely to result in a net decrease in capability, in comparison to competing organisations that gain insight from a broader range of organisations and application instances.

We think the better question to ask is: '*How will my organisation be successful in the medium term, what changes do I need to undertake, and how will AI and Cloud technologies support these changes?*'. By anchoring the ambition in the transformation of the business model (i.e. the way the organisation creates value for its stakeholders), the underlying technology is more relevant to the organisation's stakeholders, is a more integrated part of the solution, and the transformation is more likely to be successful.

Topic 2 – These technologies are complex and require significant organisational scale

A common pushback to the adoption of AI and Cloud technologies, is that they are highly complex, and as such, only large organisations have enough 'slack'[7] to enable their consideration and effective adoption.

The case studies included in our research, include small organisations as well as large organisations, across both the private and public sectors. We believe the question posed above (specifically, *'how will my organisation be successful in the medium term*') is relevant to all organisations. Indeed, each of our profiled organisations implicitly addressed this question.

The technologies associated with supporting the answer come in a range of different price/performance points. We also believe that technical advances are actively reducing the cost of these technologies, making what was recently state of the art, available to all. Moore's Law essentially continues, and most aspects of ICT costs are declining fast. Platform and shelf-based solutions are increasingly available to all.

Topic 3 – The constraints of technical debt

Many established organisations perceive the developments and innovations in their newly established competitors, as only being possible through the absence of legacy technology. This issue of technical debt has been a major inhibitor of innovation in the past, and we agree that technical debt is a challenge to be worked through.

However, we see technical debt as a tactical issue to be resolved as new candidate business models are being evaluated. Not only have many organisations been able to resolve these issues, but the use of Cloud-based technology in particular can act as a mechanism to simplify the legacy technology stack and allow for elements of the legacy stack to be progressively decommissioned, while providing users with elements of a modern technology platform.

Topic 4 – The skills required in the boardroom

Over the past ten years there has been a desire for boards to have 'Digital NEDs (non-executive directors)'[8] to appropriately guide AI- and Cloud-enabled business

model transformation. Unfortunately, not many boards have such skills within their board teams.

Our perspective is that while having a sufficient number of Digital NEDs is certainly beneficial, three non-technical board member attributes have a greater impact on organisations considering how best to revitalise their organisation: exploration mindset, discomfort with the current basis of competitive strategy and seeking a future focussed strategy.

By focusing on these three non-technical skillsets, we believe that a board is well equipped to perform its duties in approving and providing the appropriate support for the organisation's strategy, to transform in a way that is enabled by these new technologies.

Topic 5 – The balance of actions versus ideas

Some commentators believe the most challenging (and most important) part of the transformation process is the development of the idea and supporting strategy. Others say that implementation (and adaption) is the critical element of success. Yet other commentators say that the traditional approaches to strategy development and implementation are no longer appropriate as we enter this 'new paradigm'.

Our view from this research is that organisations need a balance of each of these capabilities. While there are nuances in the methodologies behind strategy development and program implementation, some which need adjustment in light of these technologies, most of the fundamentals still hold true.

Our recommendation is for organisations to have a bias towards *what to do* and *how to proceed*, rather than waiting for a perfect strategy or an optimal implementation approach. In regard to the growing focus on experimentation, we believe that this is an important capability with growing relevance, however *experimentation is not a strategy*, and while it does have a place in shifting the organisation, *experimentation is not going to transform the incumbent organisation*.

Summary

In this introductory chapter, we have considered the Industry 4.0 revolution that is upon us, and in particular, have begun to unpack the issues and opportunities that AI and Cloud can bring to organisations that wish to use them to enable transformation. New business models can be formulated by such radical capabilities. Such formulation is best built based on solid antecedent capability conditions (see Chapter 2). As in the diagnostic in Appendix 1, executives should consider the extent to which these antecedent conditions will support or hinder their potential AI- and Cloud-enabled business model transformations (abbreviated to BMT throughout this book). There is tremendous opportunity for businesses to gain advantage through BMT, and conversely, threat for those who fail to act.

Notes

1 *CIO* magazine, 27 Jan 2017. 'Banking on bots: The move towards digital labor in financial services', www.cio.com/article/234110/banking-on-bots-the-move-towards-digital-labor-in-financial-services.html
2 Foreign banks last major incursion into Australian consumer banking was pre-internet, and certainly before AI and Cloud could be deployed. Barriers to entry and cost structures are very different in the 2020s to what they were in the purely bricks and mortar days of the 1980s.
3 *The Strategy Story* (9 March 2022). 'Marketing strategy that revived the fate of Formula One'. https://thestrategystory.com/2021/07/19/formula-one-marketing-strategy/
4 Many organisations are also generating significant benefit from robotic process automation (RPA), a specific form of technology that allows machines to act like a human operator integrating various manual tasks.
5 MONTREAL.AI. (23 December 2020). 'AI debate 2. Moving AI forward: An interdisciplinary approach'. Montreal, Canada. https://montrealartificialintelligence.com/aidebate2/
6 https://info.algorithmia.com/email-state-of-ml-2021
7 Jansen, J. J. P., Van Den Bosch, F. A. J., & Volberda, H. W. (2006). 'Exploratory innovation, exploitative innovation, and performance: Effects of organizational antecedents and environmental moderators'. *Management Science*, 52(11), 1661–1674. https://doi.org/10.1287/mnsc.1060.0576
8 Korn-Ferry, 'The digital board: Appointing non-executive directors for the internet economy', 2013, http://static.kornferry.com/media/sidebar_downloads/The_Digital-Board_Final.pdf, accessed 28 May 2019.