Triggers for Digital Transformation in Key Industries

A Case Study for Australia

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Abstract

Business leaders and entrepreneurs are facing new challenges in the rapidly transforming digital economy. The benefits obtained by the employment of digital technologies are broadly acknowledged. However, decisions need to be made about which technologies to acquire and how to integrate them into the business. In order to do this efficiently, organizations and disruptors all over the world need to understand the key triggers of digital transformation that affect their operations and industries.

In this paper, the outcomes of a systematic literature review are presented which identify the triggers for digital transformations across key industries - using the example of Australia and its five core industries of services, mining, manufacturing, agriculture and construction. Outcomes indicate that triggers for digital transformation vary significantly across different industries. However, some triggers such as "environmental sustainability" were found to be important across most industries. The results contribute to current research in this field by providing a comprehensive overview of industry-specific transformation triggers. This will support decision-making for technology managers and provide the foundation for similar studies in other countries.

I. INTRODUCTION

Digital technologies are currently having a transformative impact on the global economy. Companies all over the world are moving towards changing their business models and implementing digital strategies in response to the spread of new digital technologies and the raise of new disruptive threats [1]. They adopt initiatives that exploit digital technologies in order to gain competitive advantages. Some of these potential advantages are increases in sales or productivity, innovations in value creation or novel forms of interaction with customers [2].

Digital transformation is the reinvention of an organization through the use of digital technology to execute previously analogue machine and service operations, organizational tasks, and managerial processes in order to improve the way it performs and serves its constituents [3]. Digital refers to the use of technology that generates, stores and processes data. Reference [4] defines the concept of digital transformation as "the use of new digital technologies (social media, mobile, analytics or embedded devices) to enable major business improvements (such as enhancing customer experience, streamlining operations or creating new business models)".

Digital transformation means implementing deep changes in firms, which need to develop digital capabilities in sync with its activities, people, culture, and structure and aligned towards a set of organizational goals [5]. Industries that produce mostly physical products (e.g. consumer goods, automotive, minerals and mining) may start their digitalization change with digital transformation of operations. On the other hand, industries such as financial services may already be partially digitalized and might focus on the improvement of customer value proposition [6].

Literature often provides generic information regarding the reasons driving digitalization strategies. Despite the fact that the benefits obtained by the employment of digital technologies are broadly acknowledged, there are no systematic studies about the practical reasons driving digital transformation in businesses for specific geographical areas. The focus is often global and only sometimes is narrowed down to macro-areas, such as Europe [7]. Given the differences in terms of economic conditions and characteristics among countries, the national context provides a useful scope for conducting such a study. However, narrowing the focus down to a specific country is not sufficient to obtain the results pursued. In fact, as suggested by many authors in the current literature [6][8][9], it must be considered that businesses belonging to different industries tend to implement different digital paths.

In this paper, we aim to identify the triggers that drive companies towards conducting activities to digitally transform their businesses and shed light on how these triggers depend on their industrial sectors.

For this, we conduct a systematic literature review using Australia as an example. We also identify short examples of organizations from different key industries that are currently embarking on a digital transformation journey. This will help to understand the triggers resulting from the literature review in a practical context.

The following chapters are structured as follows. In the next chapter, we provide an overview of the systematic literature review. Then, the results from the analysis will be presented – the main triggers for digital transformation in key industries, using Australia as a focus area. In addition, these triggers will be discussed in the context of the industries in focus. After that, we close with an outlook into potential future activities to follow this research.

II. METHODOLOGY

The methodology employed to develop the research is a systematic literature review and follows a proven stepwise approach [10][11]. The aim is to obtain a set of relevant papers, which includes information about triggers of digital transformation in Australia or describing how businesses in Australia are digitalizing.

As [6] claims, the digital transformation path adopted by companies depends on different factors such as strategic objectives, industry context, competitive pressures and customer expectations. A distinguishing factor for countries around the world is the unique combination and contribution of their sectors in the national economy. As a result, digital transformation has different characteristics and digital strategies have different goals throughout the industries of a specific country.

Focusing on Australia as a case study, the research has therefore been structured in line with the Australian economy and its main sectors. According to the Australian Industry Report [12] these are: Services, Mining, Construction, Manufacturing and Agriculture (see Table I). Because Services is by far the biggest sector and includes many sub-sectors, the research examines the two main sub-sectors in terms of their financial value and employment, which are Financial & Insurance Services, and Health Care & Social Assistance respectively.

TABLE I. AUSTRALIAN KEY INDUSTRIES

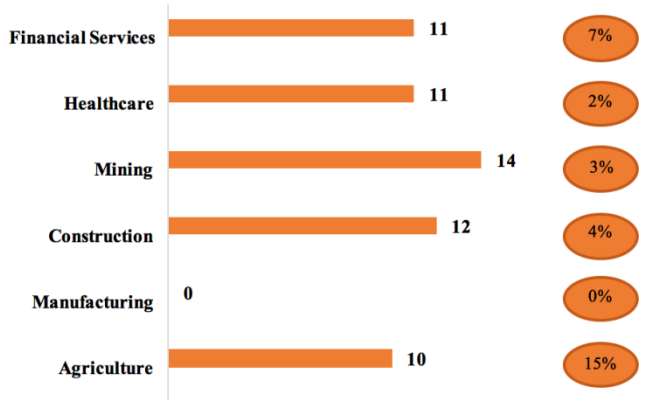
Industry	Output ($ billion)	Share of GDP (%)	Employment (million)
Services	1,015.1	61.1	9.4
Mining	114.9	6.9	0.2
Construction	134.2	8.1	1.1
Manufacturing	99.4	6.0	0.9
Agriculture	36.7	2.2	0.3
All industries	**1,400**	**84.3**	**11.9**

Source: Dept. of Industry, Innovation and Science [12]

In order to obtain relevant results, both international and Australian journals have been considered. Since the main purpose is to analyze each Australian industry, the leading journals for each sector have been considered along with the Australian journals in the same industry and non-academic reports (Government and CSIRO [1] reports). To ensure effectiveness of the results, the appropriate keywords used for the research have been extracted by either definitions of 'digital transformation' or information specific to the Australian context. Finally, the span of time that has been considered is from 2010 to 2017, as the main digital technologies employed nowadays have been released later than 2010 (e.g. smartphones)[2].

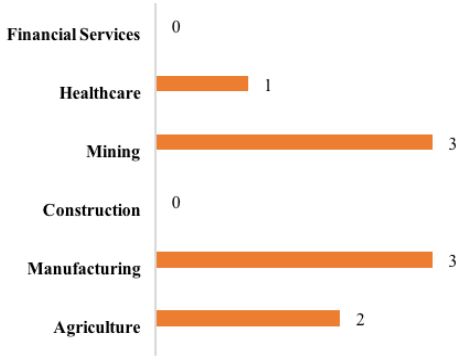
By using this methodology, the research provided relevant papers as shown in Table II. Papers that have been considered as 'relevant' are those including information about triggers of digital transformation in Australia or describing how businesses in Australia are implementing digitalization strategies. The set of relevant results obtained by the methodology has been analyzed by examining the title, the abstract, and the text consequently.

TABLE II. ACADEMIC PAPERS RELEVANT RESULTS



For the research purposes, 3 additional reports have been used for Mining, 3 for Manufacturing and 2 for Agriculture (see Table III). In the Mining sector, these reports have provided additional information and supported data included in the relevant academic paper set. The reports have been particularly useful in the case of Manufacturing, as the research has not provided any relevant academic papers. Finally, in Agriculture, reports have provided additional information along with specific examples that were not included in the relevant academic paper set.

TABLE III. REPORTS

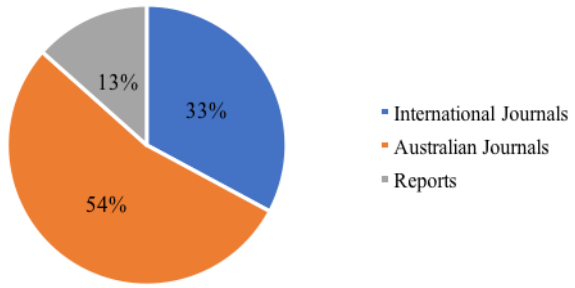


The set of documents provided by the methodology that contains relevant information about triggers and features of digital transformation in Australia is composed of international papers, Australian papers and non-academic reports as shown in Table IV.

[1] CSIRO (Commonwealth Scientific and Industrial Research Organization) is Australia's national science agency.

[2] In 2010, the cell phone subscribers were 4 million, that is the 68% of the population [13]. This means that in that year more than half of the world's population owned a mobile device.

TABLE IV. RELEVANT DOCUMENTS



III. RESULTS

The key triggers that have emerged from the literature review are recurrent throughout the five Australian key industries (see Table V). These triggers will be presented below.

TABLE V. TRIGGERS FOR DIGITAL TRANSFORMATION IN AUSTRALIAN KEY INDUSTRIES

		Triggers							
		Customer focus & value differentiation	***Cost efficiency - process efficiency***	***Environmental sustainability***	***Workers safety***	***Productivity***	***Market focus / globalization***	***Decision-making support***	***Idiosyncrasies of the industry***
Services	**Financial Services**	11	5	1					
	Healthcare	11	9						
Mining			10	4	7	17			
Construction				3		6	2		37
Manufacturing		3	3	2		3	3		
Agriculture				3		9		9	

The table shows the number of sources mentioning the triggers for each industry

- Customer focus & value differentiation

Strategies adopted by companies belonging to the Financial & Insurance industry mainly focus on *enhancing customer experience*. By meeting the customers' desire for more personalization, convenience and immediacy, companies attempt to achieve competitive advantage. Digital innovations are crucial to achieve this purpose [14].

In the Healthcare sector, "because the digital transformation of a hospital is a clinical event, patient outcomes, rather than Information Technology (IT) project goals, need to remain the focus" [15]. For the research purposes patients have been considered as the customers of the Healthcare sector, thus the patient focus can be intended as customer focus.

In the Manufacturing industry, since Australia is not competitive on labor cost for low skilled-jobs, value differentiation represents an opportunity for companies. Value differentiation involve addressing customer needs by increasing technical leadership, providing high margin and high quality solutions and selling services [16].

- Cost efficiency – process efficiency

In the financial sector, the main focus is on customers, but often digitalization strategies, such as *cost-effective service delivery* [17] also lead to process improvements and cost reduction.

The healthcare sector employs the same mechanism. The key aim is to improve the patient journey, but the use of Information & Communication Technology (ICT) also enables health services to be more efficient and the clinical environment to be a more rewarding place [18]. Therefore, the use of ICT is expected to lead to improvements in quality and efficiency [19].

In the mining sector, in order to maintain cost competitiveness, *advances in technologies and innovation* have an important role [20]. Optimization process strategies aim to reduce waste and time consumed.

Manufacturing firms in Australia tend to lag behind in terms of productivity levels. By improving process efficiency through the use of digital technologies, businesses can also achieve higher levels of productivity. Some firms can differentiate through process excellence and cost competitiveness by employing capital efficiency, automation and process improvements [21]. At the same time, process efficiency is also required to achieve more sustainable operations [16].

- Environmental sustainability

In the financial sector, IT is used to help implementing more environmentally sustainable processes by tackling issues related to the environmental footprint and climate change problems [22].

The mining industry is particularly targeted as it is energy intensive and releases big amounts of greenhouse gas emissions [23]. By employing new technologies such as automated haul trucks and others, miners reduce emissions.

Growing pressures from countries and businesses to reduce the environmental impacts of activities make this a trigger of digital transformation, as digital technologies help many businesses to achieve these improvements. However, the need for sustainable products has been driven both by the supply and demand sides, as also the demand for products that contribute in decreasing the customer's footprint is increasing. The manufacturing sector is considered an energy intensive sector and therefore it experiences pressures for processes improvements through higher efficiency and sustainability. By adopting innovating technologies such as high performance materials, additive manufacturing (e.g. 3D printing) and new energy management equipment, companies can achieve this goal [16].

In the agriculture industry, environmental sustainable processes can be achieved by both productivity improvements – that can be achieved by the employment of digital technologies

- and the adoption of sensors that generate information that facilitate environmental management activities [24], the so-called Precision Agriculture (PA).

- Workers safety

The hostile environments where mines are located, make work activities even more hazardous for human workers [23]. Improvements of safety levels is a crucial challenge for the mining sector and digital technologies can help achieving those improvements through e.g. collaborative and non-collaborative robotic systems with increased artificial intelligence.

- Productivity

The current market conditions in the mining industry makes the achievement of productivity improvements urgent [25]. Mining companies need to invert the downward trend in productivity they are experiencing [26][27] in order to face the biggest challenge that is represented by low commodity prices.

In the construction industry, the implementation of information and communication technologies has been proven to lead to productivity improvements [28]. The employment of BIM (Business Information Models) is widely considered to improve productivity [29][30].

In the manufacturing sector, Australian businesses tend to lag behind in terms of productivity levels. Studies [31] suggest that the implementation of digital technologies can lead to consistent productivity gains of 5-8% [21].

In the agriculture industry, productivity improvements are driven by some challenges the sector is facing including impact of drought and weather, the decline of commodities trade, currency exchange rate fluctuations, the need to adopt more environmentally sustainable processes, the difficulties in attracting talents, as well as the growth for food demand in the next decades that is projected to be relevant [24]. PA can play a fundamental role to limit or to emphasize the effects of uncontrollable factors.

- Market focus / globalization

In the manufacturing industry, the Australian small domestic market has many limitations and many companies do not properly serve export markets. Global consumers represent the opportunity for companies to overcome the local disadvantages. However, linking to global value chains requires improvements in innovation, technologies and standards [16].

Construction companies, in order to overcome global competition, need to employ digital technologies, for instance e-commerce platforms to enable the internationalization of businesses [32].

- Decision making support

This factor is one of the most important triggers of digital transformation in the agriculture industry. The necessity to make well-informed decisions derives from that fact that farming is getting increasingly complex and practitioners need tools to face the unknown [24].

- Idiosyncrasies of the industry

The construction industry is characterized by many factors that represent challenges and characteristics proper of the sector, including tight scheduling, high dependency on information and communication, being comprised by SMEs, proximity issues, project orientation of the industry, multi-organizational structure, necessity of multi-disciplinary skills and temporary or short term nature of the business. Digital technologies help facing most of these issues and support these characteristics [28].

IV. DISCUSSION OF RESULTS

In the following section, we describe the triggers as results of the systematic literature review in the context of the Australian key industries.

Along with the triggers, information about the sector characteristics and the features of digital transformation in that industry has emerged from the literature review. The main industries are presented below, along with the descriptions and examples of how the key triggers have sparked Australian businesses to embark on a digital transformation journey.

1) Services

Services represent the largest industry in the Australian economy, as they cover over 60% of GDP and provide an output of $1,015 billion. Companies belonging to the services sector are also the largest employers, as in 2015-2016 the sector counted a workforce of 9.4 million employees [12].

The services industry is divided into many sub-industries. According to the data gathered in 2015-2016, the largest sub-industry in terms of *value* is Financial & Insurance Services, generating a $146.2 billion in output and employing 431,100 people. The largest sub-industry in terms of *employment* is Health Care & Social Assistance, counting around 1.5 million employees and representing the second largest sub-industry by value with $112.3 billion in output. Since digital transformation characteristics and triggers will vary consistently from one sub-industry to another, each sub-sector has been analyzed separately and in this research, the sub-industries that have been considered are the most important ones mentioned above [12].

a) Financial Services & Insurance

In the financial sector, the managerial focus evolves around two aspects, which are *improvement of customer experience* and satisfaction, and *cost cutting and effectiveness*. Digital innovation is critical to meet customer needs [14], but at the same time the adoption of digital technologies enables process improvements such as recording, analyzing and interpreting transactions as well as managing information flows [33].

Commonwealth Bank Australia (CBA) has often been mentioned in literature as it represents one of the most successful examples of digital transformation in the industry. In an MIT research, CBA has been mentioned among companies undertaking digital transformation consistent with the corporate strategy. In order to face the threat of new digital entrants, CBA adopted a redefinition of the whole supply chain [34].

b) Healthcare & Social Assistance

In the Healthcare sector, the main focus is on patients [15]. In order to improve the quality of care processes are improved and therefore become more efficient. As it is claimed in the Government report released by the Digital Health Agency [35], *"the value of digital health initiatives is in how they can improve information sharing between individuals and their healthcare providers, to support better health outcomes, reduce adverse events, eliminate duplications, and improve the coordination and quality of healthcare"*.

Princess Alexandria Hospital (PAH) is the first integrated digital tertiary hospital in Australia. Digital hospitals features include electronic medical record (EMR) systems and other technical components such as integrated digital vital sign monitoring and digital electrocardiogram (ECG) records. As a result, the hospital has gained the ability to provide available data from the EMR to improve the quality and the efficiency of care, as rich clinical information facilitates system improvement [15]. Since the goals pursued by the hospital are coherent with the sector triggers, this can be considered as a relevant example of digital transformation in the sector.

2) Mining

Mining has always played an important role in the Australian economy. According to the data of 2015-16, its output is AU$114.9 billion, representing 6.9 % of Australia's GDP. The sector is ranked the third highest contributing industry after Services and Construction and it has the highest growth rate for output of all industries, amounting to 6.2 %. From an economic point of view, the 'mining boom' in terms of investments occurred in 2013, but then investments started to fall. Nevertheless, mining export volumes are still very high [12]. The challenges Australian companies are facing in this sector are both short-term and long-term. The biggest challenge is represented by low commodity prices. Moreover, Australia has become a more expensive and regulated country [36] and mineral deposits are becoming always more and more complex [27]. At the same time, the world is changing and new pressures arise in terms of more environmental sustainable attitudes, socioeconomic trends and advances in innovation and technology [27]. Digital technology gives mining companies the opportunity to invert the downward trend in productivity and improve efficiency and cost effectiveness [26][27]. The gain in connectivity through digital technologies can be combined with predictive analytics in order to support decision-making and identifying deviations from safe operating limits. Mobile applications can provide insights into issues in real-time and help safe observations. Sensors have become low cost devices and they can give visibility to operations improving decision-making processes. Advances in technology also allow the availability of 'smart clothing' that improve safety. Software can forecast scenarios and calculate changes impact on the business [26].

The mining company Rio Tinto is considered one of the most relevant examples of fully integrated and automate operations. In many papers [23][37][38][39][40][41][42][43][44][45][46][47], Rio Tinto's 'Mine of the Future' program is mentioned as an advanced example of digital transformation in the mining sector. Remote operations are coordinated in a facility located in Perth called Operation Centre and are developed using visualization and collaboration tools. These tools allow both to get real time information across the demand chain and to optimize mining, maintenance and logistic activities, as well as gain improvements in safety and environmental sustainability.

3) Construction

Construction is the second largest industry after Services and it covers 8.1 % of GDP in 2015-16. In the same period, its output grew by 2.8 %, producing $134.2 billion and employing nearly 1.1 million workers [12]. Triggers for digital transformation in this industry are mainly related to specific challenges and characteristics in construction activities and processes. Indeed, the main triggers derive both from idiosyncratic factors and external factors. However, the idiosyncrasies of the industry are the most recurrent ones and they refer to peculiarities of sector.

The use of digital technologies allows companies to address these aspects and more generally to achieve productivity improvements. Reference [28] analyzing previous studies [48][49][50] and claims that the implementation of ICTs increases the level of productivity in construction processes. Along with ICTs, the most popular technology employed by construction companies is the Building Information Model (BIM). BIM is considered both a technology and a process. At a technical level, BIM is a database containing building design information, along with data about construction's management, operations and maintenance. It can include extensions that analyze the entire life cycle and simulation processes. As a process, since BIM encompasses all aspects and disciplines, it allows all team members to collaborate more efficiently than traditional processes. It involves the collaboration of all the main stakeholders including owners, architects, suppliers, engineers, contractors and subcontractors [29].

Finally, because the nature of the construction sector is characterized by additional layers of complexities, structural fragmentation and more difficult integration of supply chain [32], e-commerce tools are technologies used by companies to overcome proximity issues, to pursue globalization strategies and to improve the communication. Reference [32] analyzed how firms can pursue internationalization strategies by employing e-commerce tools that enable them to monitor their supply chain activities in the international market. E-commerce gives businesses the opportunity to build virtual network through electronic tools that trading partners and customers can use to communicate. For instance, an Australian contractor exporting the construction business to Indonesia needs to manage and communicate with different stakeholders throughout the supply chain (designers, sub-contractors, suppliers etc.) that are located in different areas [32].

4) Manufacturing

In the Australian economy, Manufacturing covers 6.0 % of GDP in 2015-16. Its share of the economy has been decreasing in both output (-2.7 %) and employment (-3.9 %). However, the share of exports has been increasing since January 2014 and this industry has ranked as the second largest exporter after mining, representing 32.2 % of the value of Australia's exports in 2015-16 [12].

The manufacturing sector in Australia faces some disadvantages due to the high labor and transport costs, along with geographical remoteness and limited local demand. This

makes it more difficult for Australian firms to achieve economies of scale [16][21]. On the other hand, Australian firms have some advantages including a higher proportion of high-skilled workers due to of a wage-cost advantage, and a higher competitiveness on the high skilled part of the value chain [21]. Moreover, Australia has a strong reputation for quality, safety and reliability and can leverage on it to differentiate. It has been nominated the fourth most reputable country globally. Furthermore, Australia is geographically remote from many countries but is close to emerging economies such as Asia and India. Australia can capitalize on this opportunity by leveraging on its geographic proximity, time zone, free trade arrangements and strong business and cultural ties [16].

Digitalization provides the opportunity for Australia to turn disadvantages into advantages, remaining competitive in a global market. There are several opportunities that Australian firms can realize in order to turn disadvantages into advantages. To implement these opportunities, firms need to exploit digital technologies and as they aim to improve and grow by competing on product value and differentiation and by targeting export markets [21]. The main digital technologies that have been identified as crucial [16] are sensors and data analytics, advanced materials, smart robotics and automation, additive manufacturing (3D printing) and augmented and virtual reality.

5) Agriculture

Agriculture's share of GDP has remained quite stable in 2015-16, representing 2.2 % in 2015-2016, which is similar to previous years. However, the output decreased by 5 % to $36.7 billion and as a consequence the annual growth rate has been the lowest. Employees amount to an average of 321,600 workers, representing a slight increase of 1.3 from 2014-15 [12].

As digital transformation progresses '*smart digital services have the potential to help the agricultural industry meet its productivity and sustainability challenges. Risk and uncertainty is unfortunately increasing. Climate change, energy costs, availability of skilled labor and market volatility all add up, constraining decision-making for farmers and policy-makers alike'* [24].

What emerged from the literature review is that the agriculture sector is exploiting big data to drive informed decisions and improve productivity. The need for productivity improvements arises from some challenges the sector is facing, including the impact of drought and weather, the decline in the terms of trade of key commodities, the high level of Australian dollar, the need to adopt more environmentally sustainable processes, and difficulties in attracting talents. Further, digital transformation is also a response to pressure towards more environmental sustainable processes. As [24] suggests, the sector must improve its productivity levels in order to get more environmentally sustainable. Moreover, the projected growth for food demand in the next decades is relevant. All these issues drive the sector to be more productive [24]. The availability of sensors generates more information that enable a greater capacity of environmental management. In this sense, the triggers of productivity and environmental sustainability are linked as the first aims to realize the latter.

Reference [24] mentions the possibility for productivity gains through the introduction of smart manufacturing systems. Based on some case studies[3], the productivity improvement of farming activities could be measured - a 13-26% of soil fertility improvements thanks to soil fertility monitoring; 9-11% for better feed allocation thanks to specific systems managing quality and quantity; 4-9% for animal production monitoring that improves reproductive performance and growth rates; 4-13% for animal health monitoring that detects earlier possible diseases.

Kirby Smart Farm is a demonstration research run by CSIRO along with The University of New England and set in Armidale in New South Wales. The aim of the project is to demonstrate and study the impact of digital transformation and services of the rural sector in Australia in order to support future developments in applications and services. The farm was one of the first farms to be connected to the national broadband network (NBN) terrestrial wireless broadband service. The project aims to deliver several benefits including efficiency resource employment, monitoring from soil moisture levels, farm security and the possibility to communicate easily with experts. The main features include a spatially-enabled baseline dataset for farm mapping and characterization, a live map of local soil moisture and environmental conditions, a real-time location of the livestock activity, a local wireless network and a smart farm information platform that is a decision support system (DSS) integrating data derived from local sensors (soil and livestock nodes) with information regarding weather and water [24].

V. Conclusions and Outlook

The purpose of the research was to investigate triggers for digital transformation in key industries for the example of Australia. Using a systematic review of academic literature, a list of factors triggering digital transformation across five Australian key industries could be extracted. Hence, the key triggers obtained often reflect challenges or opportunities emerging within specific Australian industries. Among the core triggers are "Customer focus & value differentiation" for the Services sector, "Productivity" for the Mining and Agriculture sectors and "Idiosyncrasies of the industry" for the Construction sector. "Environmental sustainability" has been found to be an important trigger across all key industries.

However, the approach employed to develop the research has some limitations. The main variable used throughout the methodology is the Australian industry context. As a result, the main triggers of digital transformation in Australia have been identified, thus giving a global outlook of the Country. Nevertheless, the industry context is not the only variable that affects the digital transformation path of companies, as other factors such as strategic objectives and customer expectations [6] are relevant. Hence, the constraints of the research are represented by the number of variables used in the methodology.

[3] Potential for information technologies to improve decision making for the southern livestock industries, Meat and Livestock Corporation, 2012, pp. 86-93. The report evaluated the growth in Total Factor Productivity (TFP) due to the application of precision technology in each key decision area.

In order to obtain deeper insights, the number of variables has to be increased.

The methodology employed to analyze a specific context has two layers of analysis. The first one adopts a broader perspective, as it employs data deriving from the most influent international journals of each relevant sector. The second one is more specific and it is represented by data deriving from the Australian journals of each relevant sector. As a result, the first layer provides information that is applicable but not exclusive for Australia, whereas the second one provides information that is strictly related to Australia.

Considering the same premises, future research can focus exclusively on one industry in a certain country. For instance, in the Australian context, the services industry is composed of many sub-industries and future studies can narrow down the focus analyzing each sub-sector.

Similarly, the geographical focus can be narrowed down as well, considering the differences among different Australian states.

On the whole, the same structure used for this research – developed by country and by industry – can be employed to analyze other countries as well. The results shift from a generic focus to a specific and practical one.

In order to maintain a practical focus, future research can also aim to develop systematic descriptions of digital strategies employed by companies located in a specific country or area. For example, by conducting interviews with managers from companies of all industries, it is possible to gather both objective data about strategies features and objectives, and details about how these strategies are implemented and which technologies are employed.

The results obtained always suggest different levels of digital maturity, either among countries, areas, industries or sub-industries. However, in order to assess the level of maturity of one area a systematic study is needed, thus future research might also pursue this goal by using either existing models or new ones.

In conclusion, this research aims to contribute to the current literature by providing a systematic analysis characterized by practical aspects and focused on a specific context, that is Australia. In general, the project provides a starting point for many possible developments, that is represented by the methodology employed. In order to obtain practical-oriented results by using academic sources, the research focus must be narrowed down considering differences generated by geographical and industrial aspects. Therefore, by using this structure and employing this methodology it is possible to obtain practical information on specific areas and eventually, results can be further supported by interviews or can analyzed using digital maturity models.

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