Digital Transformation and Business Model

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Abstract

The main purpose of this paper is to understand digital transformation process and its main components through comprehensive analysis of existing academic literature. The paper tries to shed light on the definition of digital transformation by summarising opinions of different scholars. The author disassembles digital transformation into components and then assembles them in a new framework for further analysis in the dissertation. Discussion of digital strategy, digital business model, as well as each digital enabler – culture, people, structure and processes, and digital driver – technology, data, customer and innovation aim to elaborate their impact on digital transformation process.

Keywords: digital, transformation, strategy

1. Introduction

Over the last decades, introduction of new information and communication technologies and computerisation of processes have led to fundamental shifts in the ways enterprises work. Increased usage of software applications and mobile devices made digital technologies one of the vital elements of enterprise systems. Things and data started to become digital since the second part of last century. Gartner (2016) explains digitalisation as the adoption of digital technologies in business and society and the associated changes in the connectivity of individuals, organisations, and objects. While digitisation refers to the technical process of converting analogue signals into a digital form, digitalisation refers to using digital technologies in broader individual, organisational, and societal contexts (Legner et al., 2017). In early times digitalisation only concerned IT people, those are software and hardware related employees, but it now affects all business functions, and is embedded into daily routines of enterprises.

Businesses have always changed the way they do things. They changed suppliers when found better options, they changed market position, when renewed their target, they changed business models when current value propositions did not match the demand, and they changed strategies when faced new horizons. When all or most of these changes happened together and in a bigger scale, then business transformation occurred. Introduction of enterprise business applications like Enterprise Resource Planning (ERP) and Customer Relationship Management (CRM), rise of social media (Facebook, twitter, Instagram, etc.), expansion of smartphones and data led to a new wave of business transformation, this time digital transformation. Westerman (2011) states that, at this stage, business transformation is not just digital, transformation cannot do without digital.

In line with increased usage of digital technologies and digital transformation practices, academic journals, business literature and even social pages gave more space and attention to the topic. This has created a complexity around what was a relatively simple concept, and digital transformation became a huge bucket of anything that relates to business and IT (Chan, 2018). In this regard, it would make sense to shed light on the definition of digital transformation.

One of the earliest papers on digital transformation by Andal-Ancion, Cartwright and Yip (2003) discusses the impact of new information technologies (NIT) on business strategy. The authors describe the ways drivers of NIT change traditional value chain and disintermediate value flows. Bonnet and Ferraris (2011) link digital transformation to operational processes and customer service, and defines it as the increasing adoption of digital tools and technologies by an organisation to fundamentally change both its internal and external processes. According to McAffee (2011), digital transformation is characterised by the ever growing penetration of digital technologies into every facet of business life. By digital technologies, he means broad usage of enterprise applications, analytics tools, corporate hardware systems and individual devices. Fitzgerald et al (2013) defines digital transformation as the use of new digital technologies to enable major business improvements, such as enhancing customer experience, streamlining operations or creating new business models. Hemerling et al (2018) brings in the cultural dimension, and states that like any major transformation, a digital transformation requires instilling a culture that supports the change while enabling the company's overarching strategy. Nicholas Carr's (2003) seminal article led to the debates among scholars and business

representatives on significance of IT for strategic differentiation. In his view, not the technology itself, but what the company does with it is important.

2. Framing digital transformation

Examination of academic literature revealed three different, to some extent comprehensive frameworks of digital transformation. Their main component described below in Figure 4.1.

#	Name of the framework	Components	Source
1.	Navigating digital transformation: A framework	1. Digital strategy & transformation 2. People 2.0 3. Digital customer experience 4. Analytics 5. Digital operations 6. Technology strategy & transformation	Bonnet and Ferraris, 2011: p.23
2.	Digitisation requires mastering in six action fields	1. Customer 2. Data 3. Value proposition 4. Organisation 5. Operations 6. Transformation management	Gimpel et al., 2018: p.38
3.	Digital congruence	1. Strategy 2. Tasks 3. Culture 4. People 5. Structure	Kane et al., 2016: p.14

Figure 1 – Digital transformation frameworks

The author of this paper tried to construct a new framework by enhancing the model of Kane et al. (2016) with more "hard" and "state-of-the-art" concepts. In this sense, we used core ideas of "the implications for strategy in a smart, connected world" proposed by Porter and Hepperman (2014). According to Porter (2014), firms face ten new strategic choices driven by the characteristics of smart, connected products (Appendix 1: Figure 10.4). We identified four drivers – data, technology, customer and innovation, which are core to Porter's framework and at the same time, very popular in the literature on digital transformation, and called them

"transformation drivers". We also added separate business model layer (Figure 4.2). Although business model is included to a wider component of strategy, it is still a significant element of transformation process and therefore, needs to be studied separately.

The framework is constructed in a pyramid form. Vertical allocation of components means that transformation enablers and drivers are integral to business model, which in turn is a part of digital strategy. The horizontal dimension stands for transformation process, during what all components interact with each other and move towards a common goal. The author discusses the following sections of this chapter according to this framework.
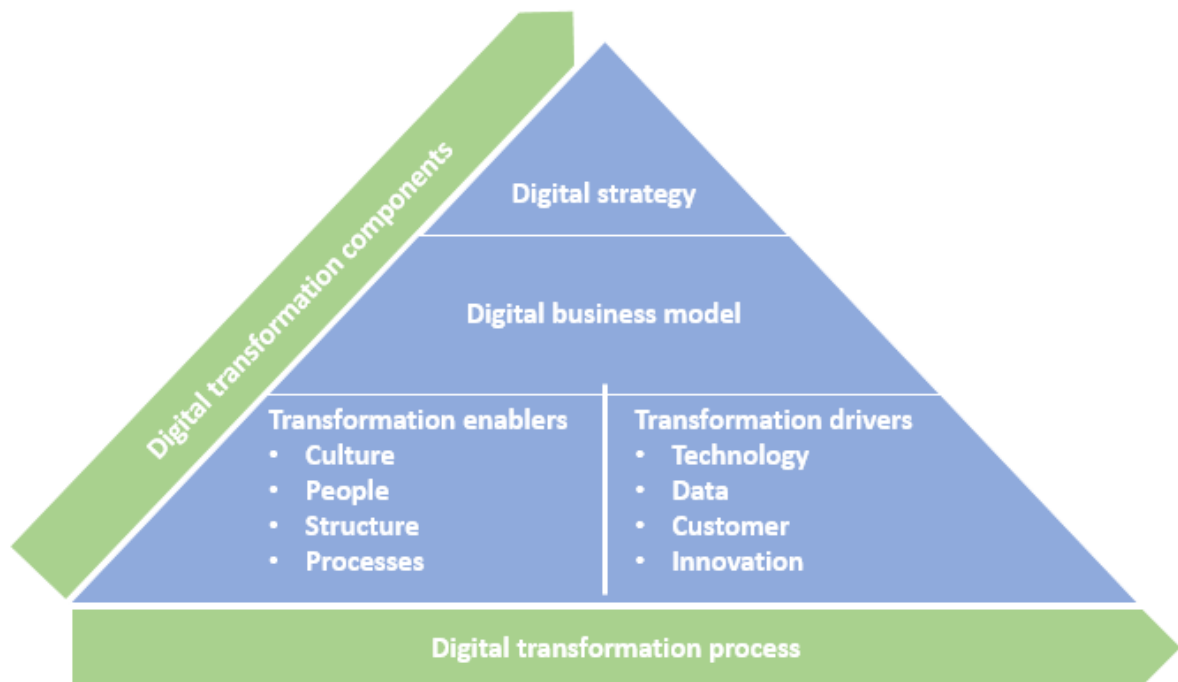
Figure 2 – Digital transformation framework

3. Digital strategy

Adoption of digital strategy is the strongest differentiator between the most successful firms in digital transformation and the rest (Fitzgerald et al, 2013). Companies need to follow a careful step toward digital transformation, designing a winning strategy and a clear roadmap across people, processes, and technology (Bonnet and Ferraris, 2011). Although Westerman (2017) warns not to call this a "digital strategy", the term is widely used in academic literature and business journals. He argues that "creating a digital strategy can focus the organisation in ways that don't capture the true value of digital transformation. You don't need a digital strategy. You need a better strategy, enabled by digital". On the other hand, in essence, the academia agrees with the point of view of Westerman. For instance, Kane et al (2017) assert that digital strategies are not about implementing technologies for the sake of becoming more digital, but they involve the opportunity for greatest business impact. Digital strategy shifts the focus of IT functions from

software and IT related operations to agile business innovations that leverage digital technologies (Gimpel et al, 2018).

Digital strategy also cannot be incremental; only inventive strategic plans are going to work (Catlin et al, 2018). While in digital strategies companies take a longer view (Kane et al, 2017), on the execution part, companies should not fall into trap by pushing envelopes too far and too fast (Westerman, 2017). The research conducted by Kane et al (2016) identified that most successful companies in Silicon Valley, to be effective in digital environment, choose ten-to-twenty-year timeframes for their digital strategy. To address the digital future, while meeting today's needs, they use the zoom-out/zoom-in approach. The zoom-out dimension looks at a time horizon of ten or more years by predicting long-term market trends and customer expectations. The zoom-in component is responsible for the next six to twelve months by identifying few business initiatives with the greatest potential to have an impact on the longer-term destination.

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4. Digital business model

Tremendous success stories of digital giants, like Apple, Google, Amazon and Facebook should not mislead us on the true reasons of business growth. A digital platform, or a digital solution may drive the growth, but the engine of transformation is the business model. According to Johnson, Christensen and Kagermann (2008), a business model consists of four interlocking elements that create and deliver value: customer value proposition, profit formula, key resources and key processes. In short, business model is a simplified representation of how companies do their business. Business Model Canvas, the most popular framework in business literature, allows enterprises to easily describe their infrastructure, offering, customers and finances (Osterwalder and Pigneur, 2010). Iansiti suggests that "a business model is defined by two things: how the organisation creates value for its customers and how it captures that value. Digital transformation changes both" (Iansiti and Lakhani, 2014: p.5).

Software and technology companies have initiated several new, digitally enabled business models. Many enterprise software application vendors, Microsoft, SAP, Oracle among others, are switching from one-time license-selling model to monthly or periodically subscription model, by decreasing capital expenditures (CapEx) and increasing operating expenditures (OpEx) of clients and having more tightened relationship with them (Fitzgerald, 2013). Development of cloud technologies enriched utilisation of this model (Hardy, 2018). Companies now offer their hand on software (Software-as-a-Service, SaaS), development platform (Platform-as-a-Service, PaaS) or server and network infrastructure (Infrastructure-as-a-service, IaaS) as cloud-based monthly services without full purchase and ownership.

The "platform" business model, obviously, currently is one of the widely applied business models (Van Alstyne et al, 2016). Uber, Airbnb, Spotify and many other prominent digital companies, which do not own physical infrastructure and assets employ this business model. Platforms bring together producers and consumers and allow them to share information and interact with each other. "Network effect" is central to this model. While traditional "pipeline" businesses create value by controlling a linear series of activities – the classic value chain, platforms only own and control their platform, where drivers meet with riders, and buyers reach to sellers.

5. Digital transformation enablers

Organisations need to be prepared for digital transformation. The author of this paper will use a new concept to assess the components, which enable or boost digital transformation, named "digital transformation enablers": culture, people, structure and processes. However, enablement is not a natural characteristic of these components, they need to become enablers. Moreover, without proper treatment, they can act as inhibitors of digital transformation.

5.1. Culture

Although digital strategies and business models of successful companies can vary from one organisation and industry to another, cultural characteristics remain almost the same for all of them (Kane et al, 2016). Creativity, agility, intellectual stimulation and positive peer relations are among the traits of the digital culture.

Aligning the existing corporate culture with new digital realities inhibits the digital transition of companies (Bonnet and Ferraris, 2011). Digitally maturing companies are constantly cultivating their culture with a strong emphasis on innovation and flexibility. Developing a digital culture may require significant shifts in corporate behaviour.

In fact, corporate culture and digital transformation are mutually interdependent phenomena. Leaders need to cultivate the right culture to digital maturity, on the other hand digital capabilities also drive the culture and its traits (Marchand and Peppard, 2013).

Risk-taking, perhaps, is the most important characteristic of innovative companies (King and Lawley, 2016). Companies blend it with rapid experimentation and agility to increase fast learnings and minimise potential damages. People need to perceive that their organisation is willing to take risks, what drives transformational projects in uncertain circumstances. Hemerling (2018) lists following five core characteristics of digital culture: more external, rather than internal orientation (listen to customers, learn customer experience); delegation over control; encouragement of boldness over caution (risk, fail fast and learn); more action and less planning (agility); collaboration over individual efforts (teamwork).

Corporate culture is one of the main factors in retaining senior bright minds and attracting new digital talents (Booth et al, 2018). Millennials are seeking digital companies with their promise of collaborative, creative environment and greater autonomy (Hemerling, 2018).

5.2. People

Digital transformation and new project management approaches bring in the roles, which were not existing before in corporate structures. Product owners, scrum masters, customer experience designers, DevOps (Development-Operation) specialists are just few of them. Companies are not only struggling to find the right people for right positions, but also trying to adapt their HR practices and procedures in line with the demand of new digital era (Marchand et al, 2013). Emphasising significance of human resources, Bonnet and Ferraris (2011) state that it is not technology that is the obstacle to digital transformation, it is people.

Digital landscape is changing skills of both IT and non-IT related people. Now sales team includes solution architects with advanced analytics capabilities to develop and demonstrate business outcomes (Iansiti, 2014). It is vital to develop a mix of digital competences across all functions, such as marketing, HR, sales, and IT (Bonnet and Ferraris, 2011). Digitally powered tools must embrace the entire employee lifecycle and completely change the way people join, learn, perform, earn, grow and leave the company (Westerman et al, 2011). Companies create online learning platforms to teach their talent.

Some surveys show that soft skills trump technology knowledge in driving digital transformation (Gimpel et al, 2018). In general, companies are looking for people who have a balance of technical and soft skills. The balance becomes especially clear when looking at the STEAM movement, which advocates adding "art" to the traditional STEM stack of science, technology, engineering, and math (Kane et al, 2016). The emerging roles in digital projects as user-interface and user-experience designers require a background in liberal arts, as much as in computer science. In fact, new-era digital specialists also value a reasonable work-life balance and the stability of large, established company (Booth et al, 2018).

5.3. Structure

Organisations can follow many paths to structuring their digital transformation projects. Smart, connected products have a major impact on both differentiation and integration in organisations, which are two basic elements of the structure (Porter and Hepperman, 2015). Many companies work to limit the power of a single individual or department (Fitzgerald, 2013). They prefer horizontal relationship to hierarchical structures. It improves flexibility and transparency at workplace and promotes innovative culture. Meanwhile, lack of clear structures and rules may hinder transformation efforts.

Porter and Hepperman (2015), as a result of recent digital trends, highlight the organisation of three new functional units. Due to the growing volume, complexity, and strategic importance of data, as many as a quarter of all large firms have dedicated data units, responsible for unified data management and driving the application of advanced data analytics. Another functional group, the dev-ops, is responsible for managing and optimising the ongoing performance of digital products. It brings together IT, software and network specialists (the "dev") and the operational team members (the "ops"). A third new unit, usually called customer experience management, is responsible for managing the customer experience and ensuring that customers get the most from the product.

5.4. Processes

Simplification and automation of business processes is a primary output of digitalisation. In order to automate processes, organisations need to describe and optimise them. This is not as simple task as it sounds. Not surprisingly, many enterprise software application implementation projects fail due to unpreparedness of business processes (Kane et al, 2016).

Digitalisation requires an integrated, flexible IT infrastructure and digital operations, supply networks, and manufacturing capabilities (Iansiti and Lakhani, 2014). A critical challenge of digital manufacturing is the integration of information technologies and operational technologies (IT-OT), which relies on close integration of business related information systems (e.g., ERP, CRM) and operations-related information systems, like manufacturing execution systems (Gimpel et al, 2018). Mobile technologies allowed to digitally document and control field service operations. Porter and Heppelman (2015) insist that we are seeing a whole new era of lean production management. Thanks to the data collected from smart, connected products, waste will be eliminated, sensors in a real-time mode will define production downtimes, and analytics system will predict maintenance schedules. Digital manufacturing enables organisations to enhance manufacturing quality and efficiency via digital end-to-end processes, ranging from design and engineering, production and shipping, to use and refurbishment (Gimpel et al, 2018). Besides core operations, digital technologies change corporate support functions or administrative processes, too. Many company officials confirm that digitalisation sharply improved their internal communications, especially through using social media (Fitzgerald et al, 2013).

6. Digital transformation drivers

Digital transformation drivers – digital technology, data, digital customer behaviours and product and service innovation – stand for the external forces interacting with and amplified by a set of factors originated from organisation's internal environment. Virtually, these are proxies of trends and successful benchmarks derived from the global digital transformation practices.

The drivers do not always act as a standalone component. In contrary, in most cases they appear as a complex of drivers, that are difficult to separate. Leadership needs to make strategic choices on what drivers or set of drivers to follow.

6.1. Technology

Digital technologies go beyond the classic term of information technologies, which merely associated with computer systems. Digital technology has three fundamental properties different from analogue ones (Iansiti, 2014): unlike analogue signals, digital signals can be transmitted perfectly, without error. Digital signals can be replicated simultaneously indefinite times, and third, ready digital content can be communicated to the incremental consumer at almost zero marginal cost.

Nowadays, main digital transformation technologies include the four groups commonly abbreviated as SMAC: social, mobile, analytics, and cloud (Gimpel et al, 2018). While these

technologies are already in widespread use, new technological trends include the Internet of things (IoT), artificial intelligence, blockchain, 3D/4D printing, wearables and augmented and virtual reality. Research conducted by Kane et al (2017) showed that, while led by analytics, SCAM technologies are still important for organisations, in near future, IoT and cognitive technologies will increase their significance.

Technology typically is not simply an add-on to existing processes and practices. Instead, it prompts the companies to rethink how they do business. Digital technology spurs collaboration and helps overcome the common barriers of functional silos (Kane et al, 2017). While technologies drive business transformation process, legacy technology may become obstacle Fitzgerald et al, 2013). Existing systems can be complex to update, especially when integrating to new kinds of technology. The companies need to establish two-speed IT architecture for successful transformation (Booth et al, 2016). Both environments of existing IT architecture, and flexible test-oriented infrastructure should work in line with transformational goals.

6.2. Data

This is a common belief that data and analytics is the foundation of success in a digital economy. P. Sondergaard from Gartner Research supplemented "data is the new oil" mantra with an original phrase – "analytics is the combustion engine" (Gimpel et al, 2018).

New data sources such as digital transactions, social media usage, embedded sensors, and mobile devices drive data explosion. Corporations go through digital transformation in order "to become more scientific in their decision-making, to rely less on gut feelings and be more data-driven" (McAfee, 2011:31). He states that analytics tools provide companies with a capability to test their initial hypotheses with near-scientific validity.

Davenport (2013) argues that the use of data is as old as decision making itself, but the field of business analytics was born in the mid-1950s. The author differs three eras in the use of analytics. In the era of business intelligence, what he calls Analytics 1.0, new computing technologies and business intelligence software were key in capturing information and reporting it. Since mid-2000s, during the era of big data (Analytics 2.0), internet-based and social network companies started to amass and analyse new kinds of data. Finally, Analytics 3.0 is the era of data-enriched offerings, where data smartness embedded into the products and services customers buy (Davenport, 2013). Porter and Hepperman (2015), supports the idea that smart, connected products supplies the traditional and mainly internal sources of data with a new source – the product itself. Smart devices can generate real-time readings that are unprecedented in their variety and volume. Data now stands on par with people, technology, and capital as a core asset of enterprises.

Davenport (2006) calls companies advanced in data as analytics competitors, which go well beyond basic statistics by using predictive modelling and sophisticated quantitative techniques. Analytics competitors manage centralised groups to ensure that critical data and other resources are well managed and different units can share data easily, in a structured and consistent formats. Marchand and Peppard (2013) emphasise that traditional IT projects, which focus on technology deployment and analytics projects, which aimed at data exploration should be governed

differently. It is crucial to understand how people create and use information, attract cognitive behavioural scientists and take iterative experiments in order to succeed in big data and analytics projects.

6.3. Customer

An actor, who gained significant power in digital era is the customer. Customers are increasingly becoming better informed and distrusting of traditional marketing methods and instead are turning to online social networks, community forums, blogs and vlogs. The creative ones monetise their knowledge and experience by influencing others on social pages. Today, consumers trust consumers more than they trust brands (Bonnet and Ferraris, 2011). The high adoption rate of mobile devices and tablets, as well as social media and collaboration applications is changing the way people share information, learn, communicate, and interact (Fitzgerald, 2013).

Digital leaders choose a strict customer-first strategy. This is not only about assigning to customer service the highest priority, but continuously following customer behaviours in order to get more insights. Organisations with an up-to-date digital agenda benefits from a greater understanding of how digital technologies, which can seamlessly immerse into customers' lives, affect customer experience at every single touch point (Gimpel et al, 2018). Data gathered based on customer experience, provides companies with insights into their customers' mind-sets, moods, motivations, desires, and aspirations. These insights lead to the development of new products and services, design of new digital customer journeys, and consequently, improvement of customer satisfaction (Grebe et al, 2018).

Enhanced with modern analytical tools, companies can obtain competitive advantage through extracting better customer insights, maximising customer lifetime value, improving retention, up-selling and cross-selling new products (Marchand and Peppard, 2013). Companies need to define which activities they can perform better than customers, and conversely, what activities customers can perform better than the enterprise.

6.4.Innovation

As a driver of digital transformation, innovation stands for the new, feasible products and services, as well as business practices employed in transformation process. We agree that in some cases, digital technology and digital innovation can be used as interchangeable terms. However, innovation, even a digital one, is a deeper notion, which must possess originality and usability characteristics (Davila et al, 2012). Digital innovation embraces also practices around particular technology, or processes related to it. For instance, discussing investments in digital innovations, Kane et al (2016) mention that in some companies, most important innovations are their funding models. It is critical for an innovative solution to become self-financing, which makes this sustainable.

Product and service innovations can fundamentally reshape the industries. Porter and Hepperman (2014) state that the innovative nature of smart, connected products can expand the very

definition of the industry itself. The competitive boundaries of an industry widen to encompass a set of related innovative products that together meet a broader underlying need.

At some points, participants of digital transformation process may become fatigue of the degree of innovation, and ask to take a break (Fitzgerald et al, 2013). However, once you start, innovation never stops. Companies have to develop a continuous process for digital innovation.

7. Results

Digital transformation is comparatively new concept, as the earliest article cited by the author on the topic is dated to 2003. However, during this limited period of time academic literature has granted enough space to the discussion of digitalisation and related theories. Extensive examination of academic journals and management papers revealed that digital transformation touches several components of business life, which were systemised by the author in a new digital transformation framework. Main conclusions of the paper can be summarised as following:

- Companies need to have a long-term digital strategy, which is integrated to overall business strategy, and supported on senior level.
- Digital economy changes the ways of doing business and digitally maturing companies reinvent their business models to meet new challenges and opportunities. In order to succeed against digital disruptors, incumbent companies can reshape their value capturing models with the help of digital technologies.
- Digital enablers – culture, people, structure and processes have enormous potential to boost digital transformation process, however, without relevant treatment they will inhibit the process.
- Successful companies invest in digital technology, data, customer experience and innovations to drive their business transformation.

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