Digital Transformation – The Hype and Conceptual Changes

LUKA TOMAT[1]
PETER TRKMAN[2]

ABSTRACT: *Digital transformation (DT) is attracting increased attention; many papers and special issues focus on various aspects of DT. Still, DT often serves solely as a repackaging of previously existing ideas. Our paper argues that the term is over-hyped and has been used to rebrand various fields to attract management attention. However, this alone cannot explain the reasons for such an immense rise in the popularity of the concept. To understand the underlying motives for current DT adoration, our paper aims to identify conceptual changes that have happened in the last decade. These changes have to be considered if companies want to strategically approach DT and use the hype to acquire the needed 'organizational energy' to implement the changes.*

1   INTORDUCTION

In recent years, digital transformation (DT) has become an extensively hyped topic in various industries (Agarwal et al., 2010) and business-oriented areas (Majchrzak et al., 2016; Kane et al., 2015). New digital technologies affect companies and their customers. Customers rely on a wide range of mobile, social, and other interactions, and companies use innovative tools to transform their processes, business models, and value propositions for customers (Berman, 2012). The experts in this area argue that management concepts are changing as companies apply digital strategies to transform products, processes, and organizational structures (Matt, Hess, & Benlian, 2015). Moreover, DT should expand beyond companies and support value creation in extended supply chains. On the wave of DT, partners should be able to shorten processing times, remove unnecessary activities, and improve productivity, leading to higher operational excellence than ever before (Bowersox, Closs, & Drayer, 2005).

Lately, DT has been widely researched in academia and increasingly implemented in companies (Skog, Wimelius, & Sandberg, 2018). However, DT is an ongoing process and

1 University of Ljubljana, School of Economics and Business, Ljubljana, Slovenia, e-mail: luka.tomat@ef.uni-lj.si

2 University of Ljubljana, School of Economics and Business, Ljubljana, Slovenia, e-mail: peter.trkman@ef.uni-lj.si

is nothing new per se. Therefore, a cornerstone is needed for companies to understand DT—why it is so popular and what has really changed. Several recent reviews acknowledge that modern DT practices are building on existing schools of thought and are partly 'old wine in new bottles' (e.g., Pihir et al., 2019; Riasanow et al., 2019; Kane et al., 2019). Those reviews attempt to identify what is new but fall somewhat short, as they present well-known factors such as identification of ecosystem, business models, digital innovation (Riasanow et al., 2019), the importance of people/workforce (Kane et al., 2019; Eden et al., 2019), and the consideration of digital technologies for changing products, services, or processes (Pihir et al., 2019).

The contrast between the recent DT hype and the fact that its main tenets have been known for decades prompt crucial research questions: (1) What are the reasons for the extreme increase in the popularity of DT in research and practice? (2) Which (if any) conceptual changes in the last decades have contributed to the importance of DT? We analyse the conceptual changes over the last decade, focusing on the nullification of marginal costs, decrease in attention, increase in the need for instant gratification, and the ability to measure customers' and employees' actions.

The rest of the paper is structured in five sections. In Section 2, we summarize the roots of DT as a concept, give several historical examples of transformation, and outline reasons for the popularity of DT. In Section 3, we identify the conceptual changes, followed by a discussion in Section 4. We discuss limitations and further research possibilities in Section 5.

2 THE POPULARITY OF DIGITAL TRANSFORMATION

Recently, DT has gained immense popularity. These days, one cannot go to any professional event without hearing about the importance of DT. The same applies to the academic community, with numerous papers emphasizing the usefulness and relevance of DT for organizations in the current business environment (Matt, Hess, & Benlian, 2015; Hess et al., 2016; Hoberg, Krcmar, & Welz, 2017). Lately, there has been a surge in published papers – while only 7 papers on DT were published in the Web of Science Core Collection in 2013, the number increased to 418 in 2018 (Web of Science, 2019) (see Figure 1). Respectable journals' special issues covering DT have already been or will be published soon (Demirkan, Spohrer, & Welsher, 2016; Majchrzak, Markus, & Wareham, 2016; Economic and Business Review, 2018).

Figure 1: *The number of papers on digital transformation listed in Web of Science*
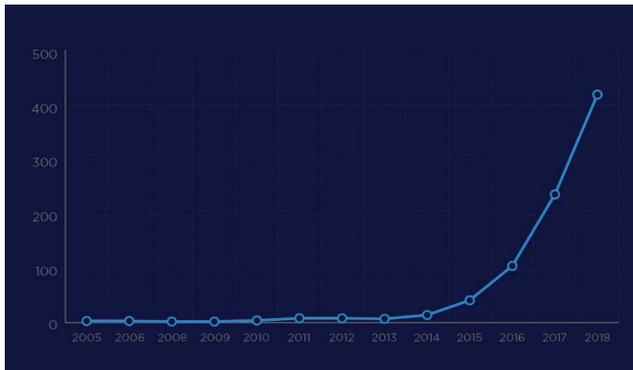
Source: Clarivate Analytics, 2019; own analysis.

The first indices of DT can be found in Bharadwaj (2000). She researched IT capability and firm performance, pointing out that the impact of digital technologies on business processes is crucial for organizations to survive in an emerging digital economy. This led to one of the earliest explicit mentions of DT (proposed by Bauer) linking the revolution in information technology (IT) to DT within dentistry, e-commerce (Bauer & Brown, 2001), and health services in rural America (Bauer, 2002).

Many papers have been published emphasizing the vital changes that DT can bring to businesses (Rouse, 2005; Morgan & Page, 2008; Shah & Siddiqui, 2006; Liu, Chen, & Chou, 2011). Literature offers many definitions reflecting various aspects of DT. For example, Solis, Lieb, and Szymanski (2014) defined it as a realignment, development, or investment in new technologies to change business models and engage both customers and employees more efficiently. Henriette, Feki, and Boughzala (2015) describe DT as an organization's ability to optimize business performance by building on rapid technological innovations based on digital technologies. Moreover, DT is a driver to transform business operations, products, processes, organizational structures, management concepts, and supply chains (Trkman, Budler, & Groznik, 2015; Matt, Hess, & Benlian, 2015). While the definition of DT has not been clear in the past (Chew, Semmelrock-Picej, & Novak, 2013) the general consensus now affirms that DT can be understood as the use of modern digital technology to change key business elements, including business models, strategies, business processes, organizational structures, organizational culture (Erjavec et al., 2018), customer experience, and streamlining operations (Reis et al., 2018). Furthermore, Stolterman and Fors (2004) describe DT as a digital technology phenomenon bringing changes not only to business but to all aspects of our lives; some studies claim that it is affecting the whole human identity (Nagy & Koles, 2014).

The potential of DT has not gone unnoticed by established organizations. Gartner, a world-leading technology research and advisory company, has recognized DT as one of the best future opportunities for business' ecosystems (Gartner, 2017). DT is perceived as the most important factor in almost every industry and business aspect, as well as among managers around the globe (Bughin & Van Zeebroeck, 2017). Companies are spending more money than ever before to catch up with the digital environment (Solis, Li, & Szymanski, 2017), and many authors have used DT to explain advancements or changes in various industries, such as newspaper (Karimi & Walter, 2016), textiles (Chen, Jaw, & Wu, 2016), banking (Liu, Chen, & Chou, 2011), and many others (Westerman et al., 2012). Driven by digital technologies, companies strive to build personal relationships and provide better customer experiences through more efficient interactions and user-friendly services and products (Fitzgerald et al., 2014).

According to the literature, DT is an unprecedented and hastily growing disruption (Bughin & Van Zeebroeck, 2017) that adapts to rapid changes, changes society and business, and helps expand new markets (Gimpel & Röglinger, 2015; Parviainen et al., 2017). Furthermore, it is important to the customer experience (Trkman et al., 2015), since it alters producer-consumer relationships (Piccinini, Gregory, & Kolbe, 2015), places value on consumer co-creation in the current digital economy (Potts et al., 2008), and shifts the paradigm from a customer-centred to an everyone-to-everyone economy (Berman & Marshall, 2014). DT also helps companies build new business models (Collin et al., 2015) and innovative business ecosystems (Selander, Henfridsson, & Svahn, 2010), and changes the mindsets of organizations, their executives, employees, and customers (Kane et al., 2015).

However, none of the claims above are particularly new. The fact that companies need to continuously innovate and that IT plays a crucial role has been known for decades (Nolan, 1995), as using IT undoubtedly changes products and services and their deliverance (Furr & Shipilov, 2019).

From a cynical viewpoint, DT may be considered a management fad (see Abrahamson, 1996) or as the reincarnation of past IT-enabled change initiatives with new outfits. As business process management (BPM) seems to be losing interest, DT may be seen as a new buzzword to capture renewed interest from managers, consultants, and software companies (Klun & Trkman, 2018, Reis et al., 2018). Technology is always changing, and as emphasized by Schumpeter (1942), creative destruction is at the heart of this continuous mutation, which is necessary for the sustainability of businesses. Economic action functions in a constant loop fed by new consumers' novel systems of transportation, production methods, markets, and organizations. Hammer (1990) summarized the main ideas of rapidly changing technologies as ever-shorter product life cycles, glacially paced product development, and the importance of customer experience. Even 200 years ago, the labour masses were destroying machines and factory buildings, worrying about being replaced by automated production lines (Jones, 2013).

For all that, from the conceptual perspective, such disruption by DT is nothing new. Innovations resulting from a combination of existing technologies have always transformed industries and economies (Arthur, 2009). Take electricity, for example, or warfare and the invention of gunpowder and machine guns. By the same token, the world has seen massive disruptions influencing businesses in the last 250 years; for instance, the prevalence of rail travel at the beginning of the 18th century encouraged big investments into railway infrastructure (Perez, 2002). Similarly, Guttenberg's printing machine transformed the whole scribing industry, enabling a much faster dissemination of knowledge. An even older case is an advanced road system that significantly changed the trading and communications of the Romans, which led to a bloom of art, culture, military, political, and economic development (Carreras & de Soto, 2013). One further example is the ice trade, which employed an estimated 90,000 people in the USA in the 19th century, while Norway exported one million tons of ice every year; these jobs were lost with the introduction of refrigerators. The Pony Express is another such disrupted industry example. It had an innovative business model with a novel value proposition (fastest mail service), which was also technology-enabled (e.g., with special lightweight saddles) and had a strong network of partners. It closed after 19 months due to the emergence of the telegraph.

In summary, new technologies are being developed, and customer preferences are changing (Solis et al., 2017); but this has been the constant state of affairs over the last 140 years or so, and no industry is immune to it (Downes & Nunes, 2013). On top of that, these changes are small compared to what is not changing (Mintzberg, 2017).

If the concept is not new, why do we need a new term? It seems that DT is an overused term invented by IT professionals and consultants to reach CxO levels. This rebranding is partly a consequence of the fact that BPM has focused mainly on investigating process modelling and the use of process models to improve the understandability of the processes (Klun & Trkman, 2018), leading to a lack of attention by top management (Reis et al., 2018).

DT can represent a new opportunity for IS experts to work with top management. Executives are turning to IT experts and recruiting them as board members (McAfee & Brynjolfsson, 2008). Consequently, the roles of CIOs and IT departments have lately gained great importance (Manfreda & Indihar Štemberger, 2018). The need for new, fancier titles has emerged, and many companies have named CDOs (chief digital officers) as members of top management (Horlacher & Hess, 2016; Singh & Hess, 2017).

DT is also used as an umbrella term to brand works in other fields, such as open innovation or change management (Urbinati et al., 2018). This increased popularity means that DT is in real danger of becoming an 'all and nothing' term. Arguing that DT is all-encompassing and holistic (Kutzner, Schoormann, & Knackstedt, 2018) poses a danger of DT becoming a meaningless filler. In a way, DT follows the snake oil principle (see Sharma & Meyer, 2019) used by software vendors and consultants to boost sales.

Still, new names for old truths can be used to develop a strong 'getting everyone on board effect', regaining enthusiasm and common vision (Zhang et al., 2015). Given the above, DT is used to unite executive boards, middle managers, and employees in a common vision and terminology. Most importantly, the common term makes them more enthusiastic about forthcoming changes. The majority of employees that follow 'digital leaders' want to be engaged with digital-like organizations and will take advantages of digital opportunities offered by the companies (Kane et al., 2015).

Hence, organizations need to carefully consider if and how to tackle DT to avoid harming them. Abrahamson (1991) emphasized that innovations, as fads or fashions, are sometimes used to pave the way for the popularity of technologies that are not efficient or suitable for organizations and thus provide them with little utility, poor economic performance, and great competitive disadvantages. Therefore, companies must strategize judiciously to avoid deficiencies and maximize the benefits of implementing DT.

Building on Collins (2013), who showed that buzzwords are sometimes intentionally generated by people within specific businesses to boost hype, it is possible to conclude that DT (as related to current hype) could be considered a buzzword.

3   CONCEPTUAL CHANGES AND THEIR IMPLICATIONS

Still, the 'repackaging of existing concepts' and 'increasing enthusiasm' does not provide a full explanation for the popularity of DT. The underlying reasons at the conceptual level have to be investigated. We argue that the following changes at company or employee levels are the most important; companies need to understand the changes happening *to* and *in* individual employees, as they are the most important assets for an organization. By knowing their employees, managers can understand what employees expect from the company and find ways to motivate employees to perform their best, thus enabling a healthy work culture (Juneja, 2019). Anyway, the most important conceptual changes are provided and explained in the continuation.

First, big data analytics and advanced algorithms improve efficiency and productivity, enabling companies to produce and share numerous services and products with almost no marginal cost (Rifkin, 2014), and automatization allows some services to be free. The Internet has dramatically reduced the marginal costs of additional transactions (DaSilva & Trkman, 2014); a typical example is a social network in which an additional user or an additional visit from an existing user does not entail any marginal costs. Thus, many business and revenue models are possible. Facebook can rely on advertising, Cyworld on selling virtual goods, WeChat on mobile banking services, WhatsApp used to charge low subscription fees, and LinkedIn has a freemium model. Customers can co-create content, which further decreases or even nullifies the costs of content creation. To a certain extent, the negligibility of marginal costs applies to many older technologies (such as radio or

TV) as well, but the number and importance of those industries exploiting the Internet are much higher.

Second, people's attention spans are becoming increasingly limited in relation to smart devices and instant connectivity. Smartphone and tablet use has been proliferating and is estimated to reach 3 billion users by the end of 2019 (Statista, 2019). People spend more than 5 hours per day on their smartphones (Elgan, 2017) and check their mobile phones between 80 and 300 times per day (Asurion, 2019). This indicates that attention will be 'the oil of the 21st century' – companies will have to invest a lot of money to draw customer attention. Moreover, addiction by design will be needed as companies will need to exploit the addictive properties of their services or products to be successful (Van Belleghem, 2017). Considering the omnipresence of smartphones and all-around connectivity (especially the Internet of Things), companies are urged to carefully consider how to transform their businesses to obtain and retain the attention of their customers; they must learn to better engage their customers and increase their user experience, which will allow them to perform better than the competition.

Third, the need for instant gratification is stronger than ever, mostly due to a lack of attention span (see previous paragraph) and synchronous communication that enables prompt interaction with others (Ramirez Jr et al., 2008). This need could also be caused by a desire to avoid delay, uncertainty of what the future holds, deriving pleasure from short-term rewards, and discomfort from anticipating bad events (Heshmat, 2016). Many examples can be found in the digital world, such as likes and comments on Facebook, LinkedIn, and Yammer, and retweets on Twitter. ResearchGate motivates their users with gratifying ego boosts, such as RG score, achievements (e.g., reaching 50,000 downloads), and ratings (e.g., being the most-cited author in a department) (Meishar, 2017). Another example is the mobile application Runtastic, which is one of the most popular fitness apps and has more than 80 million registered users. Users can track their physical activities and share their results via various social media platforms. By doing so, users gain higher motivation to be physically active and reach their goals, feel less lonely and perceive companionship. Sharing their results on social media, especially Facebook, gains them support from friends, who encourage their achievements and provide them with instant gratification (Klenk, Reifegerste, & Renatus, 2017).

Fourth, one of the recent conceptual changes is the ability to precisely measure customers' activities, which enables companies to analyse not only customers' behaviours but their overall processes (Van Belleghem, 2017). Understanding interactions with customers is not enough; companies should understand their customers' processes so they can thoroughly improve customer orientation (Trkman et al., 2015). Accordingly, this helps companies understand evolving customer behaviours and preferences, which has been recognized as the top driver for DT (Solis, Li, & Szymanski, 2017). Traditional customer segmentation is not enough. Instead, data and information from mobile users enable companies to hyper-personalize their products and services (Van Belleghem, 2017). For example, in the past, confectioners knew customers' birthdays and what cakes they preferred. Nowadays, with

digital engagement and analytics tools, companies know much more – they can know where and when a customer is going to have a birthday party, who will come, who is invited, how they will be dressed, what they will drink, and when they will leave.

Fifth, companies are focused on measuring employees' work, especially their task performance. Modern technology allows highly precise and instantaneous measurement of key performance indicators. However, tasks in predictable and measurable situations can be automated relatively easily, as opposed to unmeasurable performances that require a personal touch. More intimate, creative, and rare tasks and services are acquiring more value as passion and empathy become more important (Van Belleghem, 2017). This means that the most important employee activities are unmeasurable. Workers will thus have to acquire different skills to succeed in the workplace of the future (Manyika & Sneader, 2018) and companies will need a new way to measure employees' performance. Hence, digital and human transformation will take place in which machines will take on operational labour and humans will perform emotional tasks. The success of companies interacting with customers will rely on the digital perfection of the computers on the rational side and human touch on the emotional side (Van Belleghem, 2014). Several such cases can be found in practice; one example is hotel service automatization. Recently, hotels have begun to apply various technologies to improve their services and increase customer satisfaction (Budler et al., 2019). Thus, they offer mobile check-in and check-out, mobile interactions with guests (i.e., for ordering items and services), motion-detected and key card guest rooms, robotized housekeeping, personalization of accommodations based on recorded preferences, etc. This way, hotels save staff time, so personnel can work efficiently on more complicated guest requests. That holds especially true when guests are upset and want to share their concerns with a person, not an artificial intelligence. They want responses that are not just sympathetic and senseless but helpful and emotional (Benbria, 2016).

4   DISCUSSION

Any attempt to change a company should take the possibilities of zero marginal costs, limited attention spans, the need for instant gratification, and hard-to-measure performances into account. According to Heraclitus, a Greek philosopher, 'the only constant is change'; our environment is ever-evolving. Mobile devices, social media, business intelligence, big data analytics, cloud computing, and the Internet of Things are just some of the current technologies (also often rebranding of previously existing solutions) that affect the way companies do business. While technology can automate processes and change businesses on an operational level, organizations need to go beyond to change their mindsets and the way they deal with customers.

Many issues arise from changes and DT. Fitzgerald et al. (2014) highlight barriers arising from a lack of vision, ineffective leadership, and inadequate experience that represent challenges for companies embracing DT. Often, roles and responsibilities in the DT process are not clear. Considering institutional challenges, much effort is needed to

overcome the historical leverage of companies' technology, idea, and innovation fatigue and shift the whole culture of the company (Burack, 1991). Additionally, the pay-off for investments in DT should be clear. Any kind of transformation is a complicated process that can succeed if leadership provides a clear vision and all employees are motivated and engaged (Fitzgerald et al., 2014).

Along these lines, accruing any benefits from DT requires a combination of business and technology skills from different areas. For example, regarding supply chains, reinventing business operations on the wings of digital technology should be thoroughly considered (Trkman, Budler, & Groznik, 2015) to maximize value proposition. Also, much expertise is needed to master the emerging IT infrastructure (Bowersox, Closs, & Drayer, 2005). Organizational culture also needs to be addressed, as it defines what an organization does and does not do. Management beliefs, employees' commitment to a common goal, and their interactions play a crucial role in a major organizational shift (Lucas Jr & Goh, 2009). However, instead of hiding behind generic statements that 'top management support and organizational culture are crucial' the companies must open this black box and investigate what kind of top management support and which specific changes in organizational culture are needed (Trkman, Oliveira, & McCormack, 2016).

Operational excellence is essential to manage DT, which is often more about incremental bridging than a large overhaul (Furr & Shipilov, 2019). More precisely, companies need to digitize customer and delivery processes, such as shifting to online sales, and exploit the Internet as an opportunity to reach and engage with customers (Barua et al., 2001) to achieve the reduction in transaction costs (Mahadevan, 2000).

To successfully approach and implement DT, companies need proficient staff in project, strategic, and information systems management. A company needs to develop a digital strategy and effectively communicate it to the employees (Kane et al., 2015). Thus, strategic managers need to know how to recognize critical factors for long-term success (Trkman, 2010) and form a common vision. Project management needs to guide the project team through DT, avoiding traps and solving problems. Furthermore, information systems management skills are also vital, especially in terms of change management and redesigning business processes, organizational leadership to orchestrate the IT team, risk management to cope with daily technical innovations, and core knowledge of IT to support decision making from the technical perspective.

As a field, BPM can be of extreme importance. While BPM has been traditionally used to boost operational efficiency, it is now recognized as a key DT driver. Contrary to the traditional need for efficiency and optimization, BPM delivers automation-fuelled agility to organizations, which enables them to immediately adapt to changes (Araujo, 2017). Furthermore, through vigorous BPM capability, a company's processes become more agile and efficient, enabling higher values for their products and services; thus, the target market can be reached more quickly and with greater returns (Kirchmer, 2011). New technologies

(i.e., machine learning) affect organizations' processes, and the need for high performance triggers innovation-centred strategies. With effective management approaches supported by BPM, organizations improve their process innovations (Kirchmer, 2017). Also, BPM enables interactions among departments and drives relations with customers and partners by enabling effective communication, information sharing, and collaboration via digital technology (Garcia, 2018). However, according to Sandle (2018), BPM is involved with DT on various levels. First, BPM offers modelling tools that enable businesses to run smoothly; business analytics can then be applied, and there are content management and collaboration tools to foster communication. All of these tools form an agile organization, and BPM can help change businesses by improving operations, reducing the complexity of team collaboration, and improving the customer experience.

5   CONCLUSION

The presented overview of unjustified hype and conceptual changes can serve researchers and practitioners as a starting point to 'separate the wheat from the chaff'. While organizations build (dynamic) capabilities to transform continually, it is not essential to follow the most recent hype and adopt whatever is currently most praised in the professional press (Trkman et al., 2011). To take advantage of the opportunities offered by DT, organizations should carefully investigate changes in their industry, among their stakeholders, and in the environment and then see which new technologies are most suitable to experiment with.

Our paper suffers from several limitations that are also excellent pointers for further research. The listed changes thus should not be taken as a definitive list of trends in the last decade. The research could be upgraded by conducting a Delphi study and focus groups of practitioners and researchers to provide a consolidated agreement on the hype and changes brought by DT (see Mergel et al., 2019 for a similar study on defining DT in public administration). Another illustration of DT can be found in work by Cech and Tellioğlu (2019), who studied current and future trends with an online real-time Delphi study of international academic experts. Another good example from the BPM field is a Delphi study with academic and practical experts examining cultural values that matter in BPM (Schmiedel, Vom Brocke, & Recker, 2013). Such an approach would allow research questions similar to ours to be answered in a more rigorous manner. However, this study presents a foundation for further research. On one hand, companies will always have to innovate and adapt to new technologies, and on the other, they will need to thoroughly consider how to process constantly appearing fads such as DT, as well as conceptual changes, such as instant gratification, constant connectivity through smartphones, or increased measurability of customer processes.

Furthermore, detailed case studies could be used to investigate and compare the perceptions of employees, managers, consultants, and researchers about what DT is and

how to approach it. Also, a bibliometric study (Zupic & Čater, 2014) should be applied to identify the state of the art in the field of DT.

In summary, our central message is that companies need to build an ambidextrous approach. To avoid overhyping the changes that DT will bring, they should tackle DT more strategically by focusing on a common goal and vision with sufficient business, management, and technological knowledge (Business Informatics, 2019). However, they can also profit by using the DT hype as an opportunity to build consensus and give a clear purpose to employees and management; this can serve as a strategy to build and maintain enthusiasm for changes and obtain short-term wins. To say it simply – DT needs a heart (Westerman, 2018).

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