DIGITAL TRANSFORMATION – A HUNGARIAN OVERVIEW

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ABSTRACT: *Digital transformation is considered as an increasingly important process for organizations today, critical for the survival of companies. The spreading of digital technologies throughout our societies brings along various changes in organisational culture, people, business processes and business models. The perception of digital transformation's importance among the management of companies is lower in some European countries, among others in Hungary. Our research aims to provide an overview of digital transformation in Hungarian companies from the dimensions of strategy, technology and digital innovation capabilities. We discuss the objectives of digital transformation and the role of IT departments in digital transformation. The research is part of an ongoing research, in which IT-related practice of Hungarian organizations is explored on a yearly basis, starting in 2009. 167 organizations participated in our last study, in 2018. As our survey results revealed, there is a moderate-strong demand for digital transformation, but the consciousness and perception of how technology will change the nature of business varies among industries. Most of the questioned Hungarian companies deal with digitalization at the strategic level; however, there is still a large group of firms that manage digital transformation as an IT problem. Although the objectives of digital transformation are clear, organizations heavily lack preconditions for successful transformation.*

Key words: *digital transformation, digital innovation, digital strategy*

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1 INTORDUCTION

Digital technologies disrupt practically every industry; the development of information and communication technology has changed the economy as a worldwide phenomenon. However, most European countries are falling behind in this respect (Indihar Štemberger, 2017; Erjavec et al., 2018; Fehér et al., 2017). Indihar Štemberger et al. (2017) conclude that the perception of digital transformation's importance among the management of companies is lower in some European countries, like in Hungary and Slovenia, than in other countries. Most business executives say digital technologies are primarily an

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opportunity and not a threat (Kane et al., 2016). Digital transformation is one of the main factors of competitive advantage, it provides new methods for process maintenance and optimization, and it improves customer experience and engagement (Schreckling, E. & Steiger, 2017). Technology is a key precondition for business innovation, but as it is generally accepted, strategy has a decisive role in digital transformation (Berghaus & Beck, 2016). Digital transformation results in significant changes in the value adding processes, but carries risks as well. According to our experiences collected from the companies, organizational preparedness is a crucial factor which can reduce the risks. Hungarian companies notice the importance of digital transformation, but they assess their preparedness to be at a low level.

Pressures for digital transformation are present also in Hungary. Our research aims to provide an overview of the digital transformation in Hungarian companies using the framework suggested by Evans (2017). We discuss the following research questions:

- RQ1: What are the position and objectives of digital transformation in Hungarian companies compared to the literature?
- RQ2: What is the state of digital transformation in Hungarian companies compared to the literature and previous studies from the dimensions of strategy and digital innovation capabilities?
- RQ3: What are the key technological enablers of digital transformation?
- RQ4: What is the role of IT departments in digital transformation in Hungarian companies?

We detail the findings of the research on digital transformation as a special part of our yearly IT management survey of Hungarian organizations. We collected data through anonymous questionnaires. As discovered, digital transformation is a key priority for Hungarian companies, but they are uncertain about how to reach it. Most of the questioned Hungarian companies deal with digitalization at the strategic level; however, there is still a large group of firms that manage digital transformation as an IT problem.

This paper is structured as follows. Section 2 gives an overview of the theoretical background of the study. The third section specifies the research methodology and data collection. Section 4 presents the results of data processing. Finally, the fifth section provides conclusions.

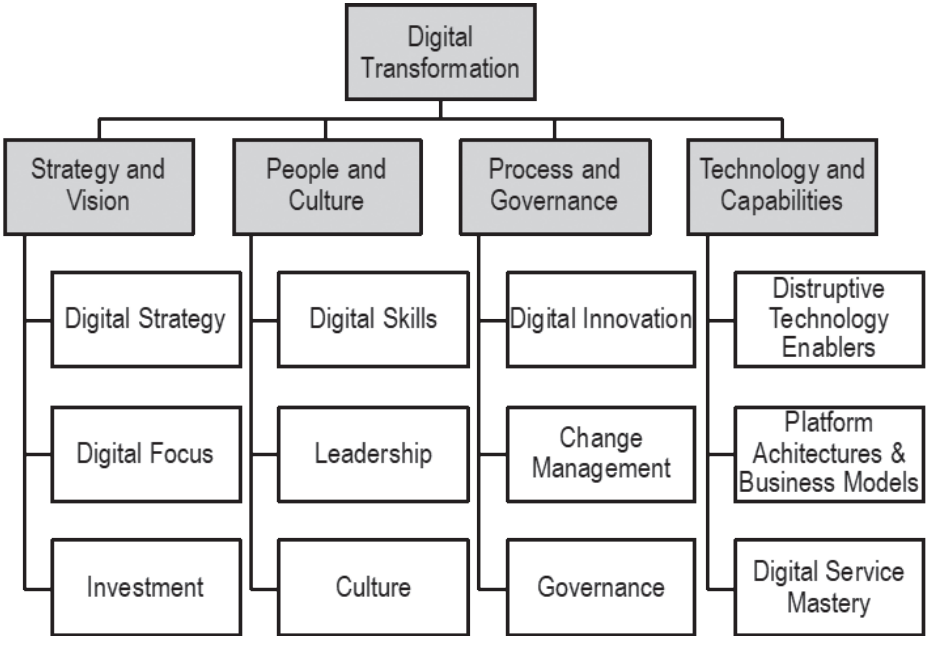
2 DIGITAL TRANSFORMATION – A LITERATURE REVIEW

Digital transformation is a hot research topic in the literature with several definitions. We discuss this concept on the level of organization. Westerman et al. (2014) emphasize the performance improvement as "the use of technology to radically improve performance or reach of enterprises". Bharadwaj et al. (2013) determine it as "an organizational strategy formulated and executed by leveraging digital resources to create differential value". Liu et al. (2011) underline the business process related aspect as "the integration of digital technologies into business processes".

Digital transformation as a concept has been investigated in the literature from several viewpoints. Morakanyane et al. (2017) present a concept centric matrix of digital transformation, which details its definition, characteristics, drivers, key impacts and transformed areas. Bohnsack et al. (2018) perform a systematic literature review regarding digital transformation of the past 20 years' articles. They incorporate various research perspectives into a comprehensive multi-dimensional framework of digital transformation, linking determinants, processes and outcomes. Determinants include enablers, firm capabilities and context. Processes cover agency, transformation processes, digital business strategy and digital innovation. Outcomes consist of change and economics. They apply the framework for research gap identification. According to Bohnsack et al. (2018), a limited understanding regarding digital transformation's theoretical constructs and underpinnings have been performed so far. They developed a multi-layered perspective of digital transformation, which supports a better theorization and explanation of "what" digital transformation is.

There are several researches targeting the overview, the maturity level and the decisive factors of digital transformation (Kane et al., 2016; Erjavec et al., 2018; Chanias et al., 2016). Evans (2017) identifies four key pillars of digital transformation: (1) strategy and vision; (2) people and culture; (3) process and governance; and (4) technology and capabilities (Figure 1). These key pillars have decisive components, as summarised in Figure 1.

Figure 1: *The key pillars of digital transformation*



Source: Evans, 2017.

The pillars and their components provide a framework for the digital transformation analysis and facilitate a bigger picture about it. Evans (2017) draws attention by claiming that digital transformation is not the "final destination" of the companies, as there is a need for an agile attitude, namely rapid response to change and continuous innovation. The strategy and vision pillar focuses on maintaining the customer-centric (outside-in) perspective and cover digital transformation strategy, digital transformation focus and investments. Digital transformation requires new capabilities and skills. These include capabilities related to disruptive technology enablers, platform architectures and business models, digital services mastery, and digital innovation. The people and culture pillar includes digital skills, leadership and culture. Change management has a key role in this rapidly changing environment; where companies must adopt business processes and new governance methods as well. The technology and capabilities pillar's components are disruptive technology enablers, platform architectures, business models and digital service mastery.

Our research targeted areas and questions belong to the strategy and vision (RQ1; RQ2); technology and capabilities (RQ3); and people and culture (RQ4) pillars from Evan's framework.

Manfreda (2018) investigates the potential barriers of digital transformation in organizations. As the main barrier, the companies expose the change management capability, followed by the lack of proper knowledge and skills, and the inability to experiment quickly. The companies also highlight isolated silos within the organization and too many competing priorities. The latter is also the main barrier in worldwide companies (Kane et al., 2016).

The barriers detailed are mostly of an organizational nature and are related to employees and their lack of knowledge and skills needed for successful digital transformation in companies. However, it is important to add that insufficient technical skills on the part of the technology staff within the analysed companies are perceived as the least important barrier (Kane et al., 2016). The latter indicates that the lack of proper knowledge and skills as one of the most important barriers for digital transformation does not refer to the lack of technical skills but rather some other knowledge and skills. Risk avoiding behaviour of the companies can be a possible answer for the above detailed barriers:

- Employees must be properly prepared for digital transformation; they need new digital skills, which must be improved by the companies.

- Companies must monitor and evaluate technological trends; they must apply new innovative solutions.

- New organizational roles and units/departments must be formulated with clear goals towards digital transformation.

3 RESEARCH METHODOLOGY AND BACKGROUND

This research aims to give an overview of the state of digital transformation in Hungary – according to the dimensions discussed in Section 2. The methodology is a combination of the quantitative and qualitative approaches, including literature review, questionnaires and processing of the collected data. Frameworks from the literature review supported structuring the research questions and areas. Digital transformation related surveys and questionnaires (HBR, 2015; Kane et al., 2016; IWI-HSG, 2015) were used as a reference.

The research of digital transformation in Hungary is part of an ongoing research in cooperation with Hungarian CIO Association (number of core members: 41 in 2018, direct reach to more than 1,000 Hungarian companies), in which we explore IT-related practice of Hungarian organizations on a yearly basis, since 2009. The expanded network of the Hungarian CIO Association consists of organizations that follow the recent IT research topics and innovation. We yearly invite small, medium and large companies from the network of the Hungarian CIO Association to participate in the study, sending them a questionnaire and asking them to forward it to a member of the administration

board responsible for digitalization or IT or to a person who is responsible for the field of digitalization in the company. In 2017, 150 organizations joined the research, and in our last study, in 2018, 167 organizations participated in it. It represents a 15 per cent response rate in 2017 and 16.7 per cent response rate in 2018 with all the data valid for the analysis. We completed the survey results with selected executive interviews, to understand the background and motivation or results. Considering the organizational side, the sample of the 167 companies consisted of 24% SMEs and 66% enterprises. 29% of the organizations were dominantly state-owned, 27% had domestic, and 44% had international private owners.

The survey consisted of the following blocks:

- Organizational demographic questions (size, industry, dominant owner)
- Role, position and reporting line of IT
- Applied technologies and planned new technology projects
- Digital transformation-related questions (objectives, strategic frames, organizational support, sources of innovation ideas, role of IT in digital transformation)
- IT strategy related questions
- IT service management issues

The survey was based on international standard surveys, adopting questions from IDG's "State of the CIO" survey, HBR (2015) and Kane et al. (2016) survey questions. In this paper, we concentrate on digital transformation related questions, but also involving technology development issues.

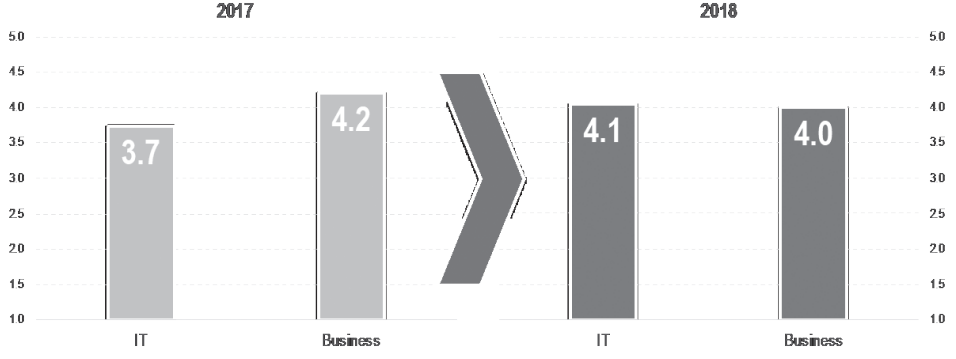
4 DIGITAL TRANSFORMATION – THE HUNGARIAN RESULTS

Digital transformation is a key priority for the Hungarian companies, but based on our results, they do not clearly see the way how to reach it. The key pillars of digital transformation defined by Evans (2017) provide the framework for the research questions' discussion. Section 4.1 deals with RQ1 (the position and objectives of digital transformation in Hungarian companies compared to the literature), focusing on vision, digital focus and directions (the strategy and vision pillar in Evans' model). Section 4.2 investigates the relationship between digital (business) and IT strategy, and classifies the approaches of digital innovation. This section gives an answer to RQ2 (the state of digital transformation in Hungarian companies compared to the literature and previous studies from the dimensions of strategy and digital innovation capabilities; it is the strategy and vision pillar in Evans' model). Technology and capability related issues (disruptive technology enablers, platforms) are reviewed in Section 4.3. This section resolves RQ3 (the key technological enablers of digital transformation). Finally, Section 4.4 analyses the topics of leadership, culture and governance, concentrating on the relationship and collaboration between management and the IT unit, answering RQ4 (the role of IT departments in digital transformation in Hungarian companies).

4.1 The state and objectives of digital transformation

The state and objectives of digital transformation belong to the strategy and vision pillar of Evans' (2017) framework. Similarly to IWI-HSG (2015) questionnaire and HBR (2015) study, we investigated the state and the importance of digital transformation in organizations from the IT and business departments' point of view (Figure 2).

Figure 2: *Experienced importance of digital transformation for organizations by organizational domain (IT and business) on 1-5 Likert scale*[4]



Although in 2017, business decisions makers were more ahead considering the importance of digital transformation, by 2018, IT departments showed more awareness in this question compared with business departments. Kane et al. (2016) suggest five categories of reasons to deal with digital transformation:

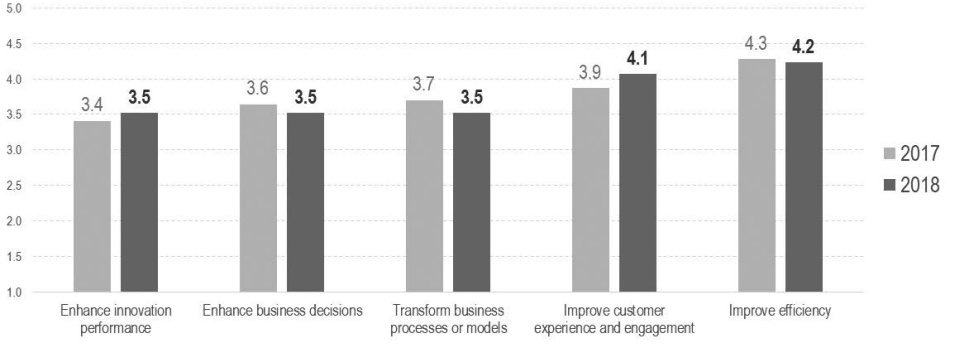
- Improve customer experience and engagement
- Increase efficiency
- Increase innovation
- Improve business decision making
- Fundamentally transform business processes and/or business models

We applied these categories in our questionnaire (Figures 3, 4 and 5) and analysed the IT and business side as well (Figure 6). The main reason to deal with digital transformation in our case was increasing efficiency, followed by improved customer experience and engagement from IT and business point of view too. The results in the first two categories are the same as in the cited Kane's et al. (2016) paper, but the order is different.

4 Abbrevations represent the background of the answering person: IT stands for the IT department, while business is used for various business departments.

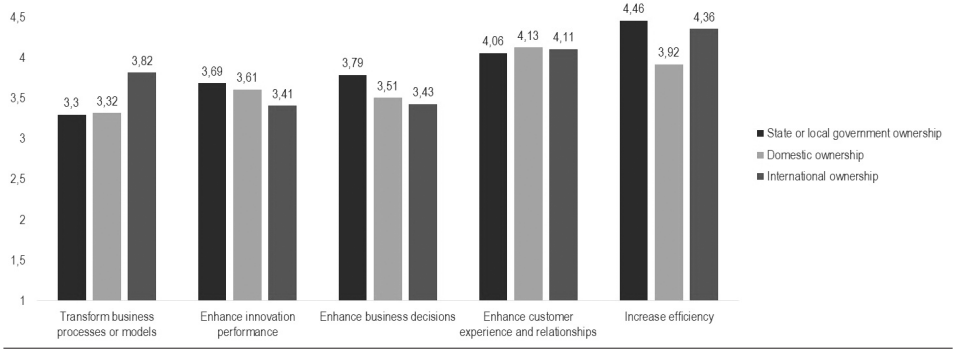
Comparing the objectives of digital transformation in 2017 and in 2018 (Figure 3), there are only slight differences. The first three options (enhance innovation performance, enhance business decisions and transform business processes or models) are equally important in 2018, most of the companies selected them. The most common objectives (strongly agree or agree) for digital transformation are increasing efficiency and improving customer experience and engagement, both in 2017 and 2018. Comparing to the research results by Kane et al. (2016), it is visible, that the expectations towards the objectives of digital transformation are stronger in their sample.

Figure 3: *The objectives of digital transformation by year (on 1-5 Likert scale)*[5]



The goal of enhancing customer experiences leads the list (4.52 in Kane's et al. sample vs 4.1 in our sample), followed by increasing efficiency (4.35 vs. 4.2). The remaining options (enhance innovation performance, enhance business decisions and transform business processes or models) are significantly lower in our sample (respectively, 3.5 4.1 and 4.06 vs 3.5). Although the leading goals are the same, the clarity of objects among Hungarian organizations is more uncertain.

Figure 4: *The objectives of digital transformation by ownership (on 1-5 Likert scale)*[6]

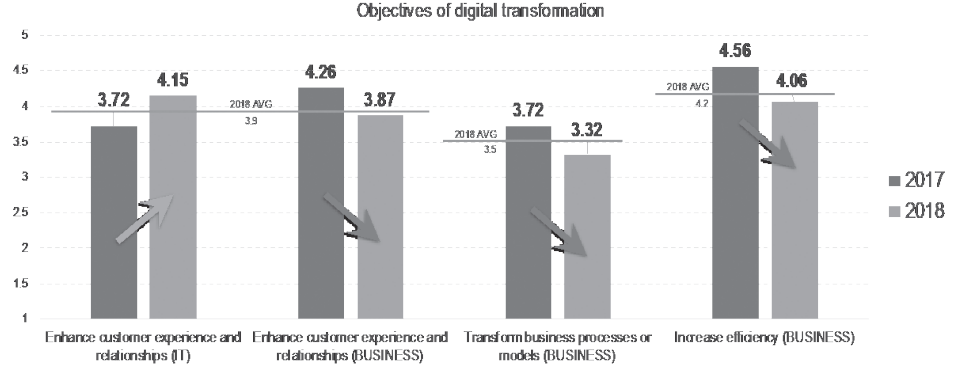


5 IT and Business together.

6 IT and Business together

Analysing the details of the objectives of digital transformation, by ownership of organizations, there are mixed patterns. For companies with international ownership, transforming their business models and/or processes is far more important than for Hungarian organizations, but they are less interested in achieving better decisions or enhancing innovation performance. For domestic companies, enhancing customer experience and relationships is the most important goal, and increasing efficiency comes only second. Surprisingly, considering the objectives, the public sector is on the same level as the private sector organizations or even more ambitious. The only exception is the objective of transforming business models (that is less addressed) or processes. We noticed some uncertainty from the business side, as shown in Figure 5. Comparing with the 2017 results, in 2018, business representatives show lower motivation for digital transformation goals, while IT departments pay more attention to these questions.

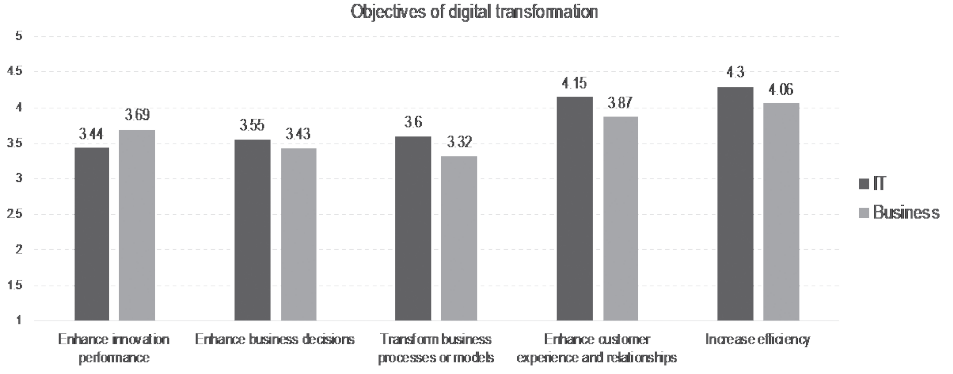
Figure 5: *Changes in the objectives for digital transformation by IT and Business (by year on 1-5 Likert scale)*



Digitalization is not a goal per se; it helps perform the business and strategic expectations. Only the customer relationship and customer experience improvement objectives are more important in 2018 than in 2017. Although the other three objectives are less important in 2018 than in 2017, all of them got high rates, so they are still in the focus of the digitalization.

Comparing the objectives reported by business and IT domains (Figure 6), we can observe the rising awareness of IT departments about the innovative utilization of digitization. IT representatives have a stronger priority considering the strongest objectives: increasing efficiency and customer experience questions.

Figure 6: *The objectives of digital transformation by IT and Business (on 1-5 Likert scale)*



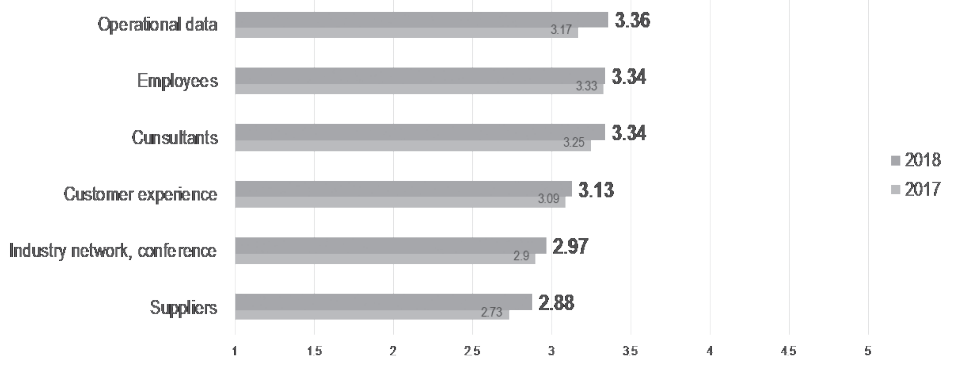
4.2 The relationship between business strategy and digital transformation

One of the key pillars of digital transformation emphasized be Evans (2017) is digital strategy. Digital strategy is different from the traditional IT strategy that focuses on business needs, and the IT organizational unit's responsibility is to fulfil these needs, discover unsupported areas, facilitate decision making and controlling. IT strategy is a technical answer to a business question, while digital strategy is about transforming business using emerging technologies. Digitalization needs a cross-functional strategy that has an impact on any function or processes. Digital strategy is the "new business strategy", the main input for IT strategy that will prepare and consolidate implementation. Our research shows a stable trend, more than 60% of the organizations deal with digitalization related issues as a part of business planning, while around 20% integrate digitalization into the traditional IT strategy. Only 9% of organizations have a dedicated digital transformation strategy, and almost 13% of the respondents reported that they have no strategy for digitalization at all. Most organizations manage digitalization at the strategic level, but there is still a large group of companies that considers digital transformation related issues as pure IT problems. Digitalization is less important for companies where IT plans are derived directly from the business plan (linked planning), some of them have digitalization strategy, but the influence of the IT unit on digitalization is less significant. Companies that implemented integrated planning process defining business and IT plans in a parallel way are more active in putting digital transformation and digitalization concepts into their planning initiatives. The results show that extensive experiences in strategic alignment are a powerful catalyst of digitalization strategies.

From the aspect of governance and processes, digital innovation is also a key pillar of digitalization (Evans, 2017). Improvement of digital innovation capabilities can be based on several strategies. Kane et al. (2016) finds that developing existing employees' digital capabilities is the most common way of strengthening digital innovation capabilities (in almost 30% of companies), while 20% of companies are strengthening it with

contractors and consultants. The most popular way of identifying new digital innovation opportunities is operational data (in 67.2% of the Hungarian surveyed companies), meaning that companies are collecting, processing and analysing operational data. This result is promising because data processing provides an objective and clear view of the operation, and the bottlenecks in business processes as well. Developing digital capacities of existing employees and consultants are also common ways (67%), so companies are aware of the need for more skilled personnel, but they rely on consultants too (Figure 7). Despite the fact that suppliers are the least used sources (57.6%) within industry network conferences (59.4%), they are used by more than 50% of the companies. Comparing the results in 2017 and 2018, all the sources were utilized more than in the previous years; companies are more committed toward improving their digital capabilities. To sum up, Hungarian companies apply all the methods we questioned, making them valuable sources of strengthening digital innovation capabilities.

Figure 7: *Sources of identifying new digital innovation opportunities (on 1-5 Likert scale)*



4.3 Technological enablers

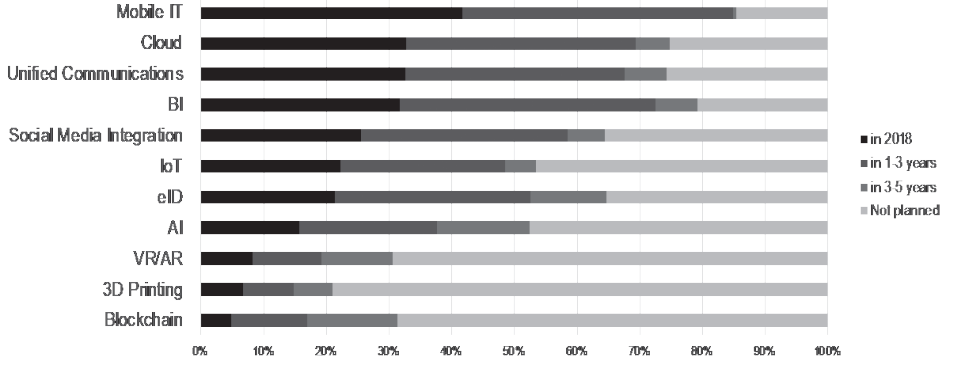
Digital technology is positioned as an opportunity or choice (Kane, 2016). This research analyses them with reference to literature and the previous years' research experiences. The main technological trends include cloud computing, mobile systems, big data analytics, and social listening (Morabito, 2014). According to the digital technology study from 2018, mobile, cloud and enterprise communication solutions are the top three ones (Figure 8), with mobile and cloud technologies changing their places on the list, compared with the 2017 results.

This results are similar to other surveys (e.g., BT, 2016), where the most widespread disruptive technologies are the cloud (58%), and mobile technology and collaboration (54%); while the popularity of data management related initiatives (business intelligence, big data management) are much less frequently mentioned in Hungary (19%) than on the

international level (52%). Mobile and cloud technologies are in the top three on Kane's et al. (2016) "most important technology" list as well. A growing interest in mobile technology is not a surprise, as they give support to easier access to services in several areas, e.g., customer relationship management.

Digital solutions enrich groupware, document management and communication. The need for BYOD (bring your own device) usage is growing, and relating to that usage of the cloud, the security of enterprise networks and mobile devices is a challenge from the operational aspects. There has been a noticeable interest towards enterprise communication solutions since 2014. At least 32% of the companies would like to start a project related to this technology every year from 2014 till 2018. Social media integration is not in the top three solutions anymore, based on our result. Companies find business intelligence (BI) more important than social media integration. Blockchain, 3D printing and VR/AR (virtual reality/augmented reality) are the least important technologies, similar to Kane's et al. (2016) results.

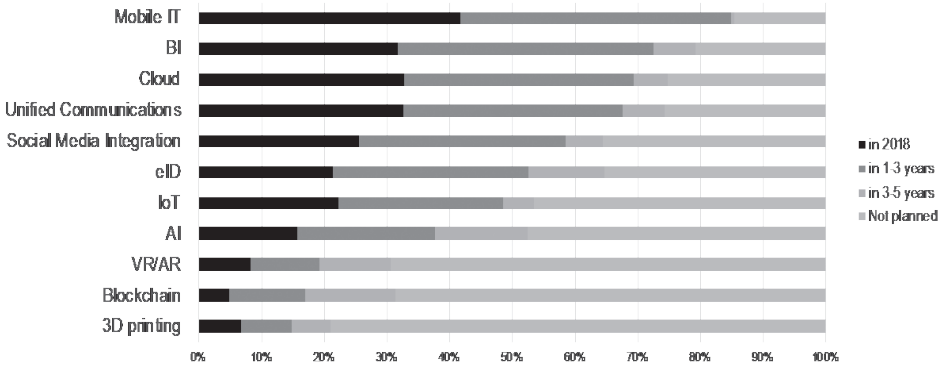
Figure 8: *The most important technologies (planned projects for the following years)*



Technologies in the next 1 to 3 years

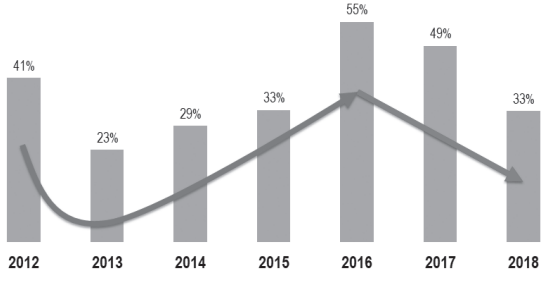
Regarding the planned projects in the next 1-3 years, the result is like the current technology landscape, except for business intelligence, which will become more important than it is now (Figure 9). Hungarian companies put mobile technology on the first, business intelligence on the second, and cloud technology on the third place. The least important technology group remains the same as at present; blockchain, 3D printing and VR/AR. There has been a continuous high interest in mobile technologies, with more than 40% of the companies planning to start a project related to them every year from 2012 to 2018.

Figure 9: *Technologies in the next 1-3 years*



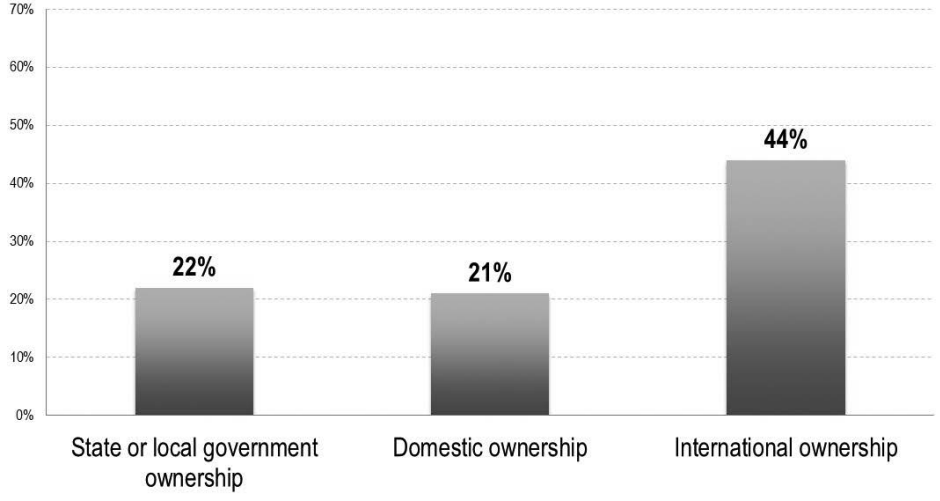
Compared with the results from the previous year, cloud solutions are still in the top. The application of cloud technology has moved forward in its maturity curve, it is in its matured phase now (Figure 10). After the decreased usage in 2013, companies started to use cloud solutions more, reaching a plateau in 2016. National companies preferred cloud solutions, and now foreign owned companies in the corporate sector use them too. There is a growing interest in the public sector as well.

Figure 10: *The usage of cloud technologies from 2012 to 2018*



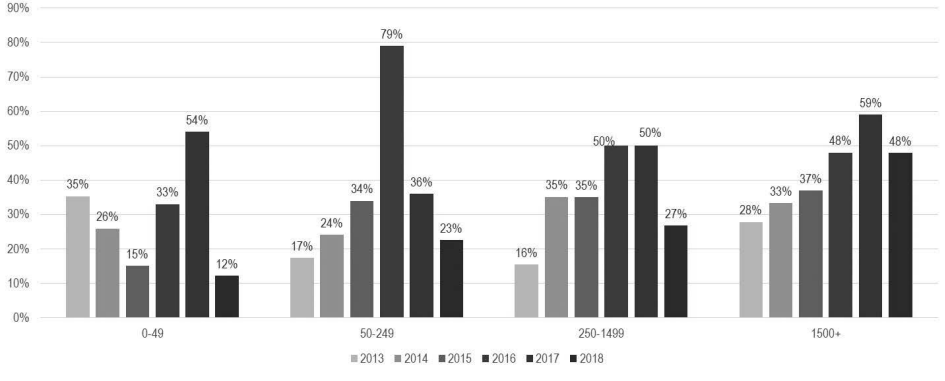
Cloud projects are clearly driven by internationally owned companies, as they are not only motivated but also required to do so by their parent companies (Figure 11). The roll-out of international projects and the support based on international experiences help local multinational companies to lower their risks in cloud technologies. Beside multinational organizations, cloud technology has gained advantage also in local organizations, and even organizations with state or local government ownership started cloud projects. Moreover, there has been an important change in the involvement of the Hungarian government in developing a central cloud solution and application services for the whole public administration sector. The roll-out of these services is developing continuously, especially for government agencies and local governments.

Figure 11: *Cloud solutions by ownership*



Through analyzing how organizations started their cloud-related projects, we can see a tendency that the popularity of using the cloud started in the SME sector, especially among small organizations (Figure 12). The reason is that for small organizations, the value offering was faster and cheaper than developing their own infrastructure, especially as companies in this size lack the required IT competencies. Popular solutions were the following: e-mail and calendar, collaboration tool, and basic business support applications. Small organizations were ready to take the technology risk in order to gain the cost advantage. Interestingly, this sector was able to renew. After the pioneers started their projects in 2013-2014, we identified a higher peak of cloud projects in 2016-2017, as technology also evolved. Medium companies also peaked in 2016.

Figure 12: *Ratio of cloud initiatives by the number of employees (on 1-5 Likert scale)*

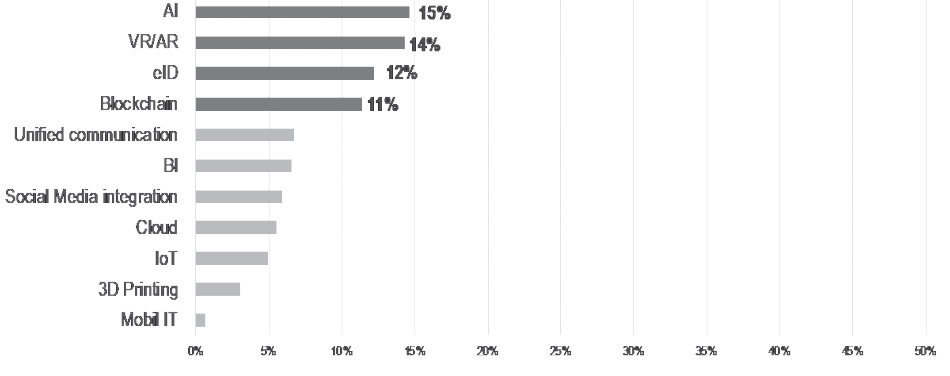


Large enterprises were more risk averse: the peak and popularity of applying cloud technologies were achieved parallel with the development of cloud technology. Larger companies often reported security and privacy concerns as a barrier. Another barrier was the complexity of the company's IT services: complex solutions (like ERP as a service) had to reach their maturity; additionally, the transition period was identified to be longer and riskier in larger companies than in small companies. Larger companies were expected to have clear business cases in order to be convinced to go on with cloud projects.

Technologies in the next 3 to 5 years

Technologies in the next 3 to 5 years show a different picture than the current one and the one depicting technologies in the next 1 to 3 years. Artificial intelligence leads the list, while VR/AR and blockchain shift their places from the last three to the top ones (Figure 13). Business intelligence is expected to be on the sixth place, it is an interesting mixture of "traditional" technologies and new trends. The matured BI technologies, such as dashboards and visual data discovery, are in a "slope of enlightenment" phase, according to Gartner's hype cycle terms (Willems, 2017), (Gartner, 2018). The business intelligence field has a key role in companies; they support data collection, processing and analytics. The BI domain has been continuously renewing, new interdisciplinary areas have appeared, e.g., security analytics. IoT provides new possibilities in data collection and BI trends include artificial intelligence and machine learning (Lebied, 2017) as well. Companies plan to have projects in the next 3-5 years related to artificial intelligence, which is considered as a megatrend now. Real-time and context-aware decision making appeared as a requirement and not only a possibility anymore. Social media integration to the enterprise solutions was a noticeable intention in 2017, with almost half of the companies planning a project in this field. This situation changed in 2018, as only 25% of the companies were interested in social media integration. We got the same result when we analysed the projects planned in the next 1-3 years. The reason of the low interest can be that social media solutions are matured, and companies have some solutions in this field.

Figure 13: *Technologies in the next 3 to 5 years*

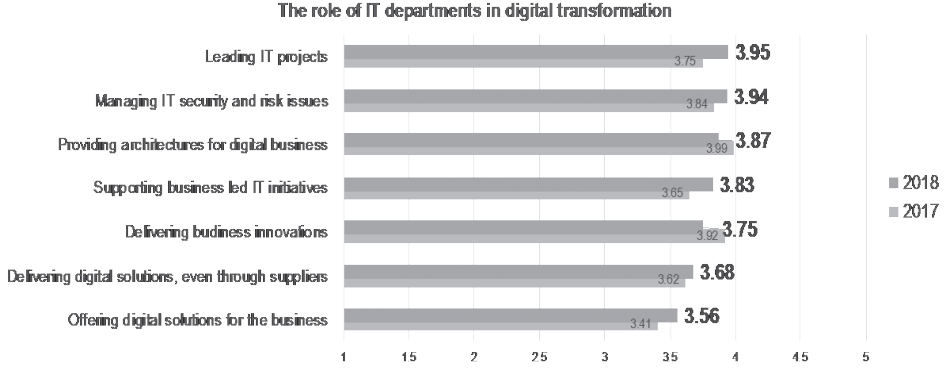


Identity management, which is a fundamental precondition of digitalization, is not in the current focus and will not be in the next 1 to 3 years. However, it is in the top three technologies in the next 3 to 5 years. Artificial intelligence solutions can enrich and extend the capabilities of identity management through the combination of machine learning and biometrics. It is interesting to see which technologies the companies avoid. 3D printing is a very interesting niche technology with a limited usage scenario in some industries; however, less than 5% of the companies showed interest in it in the next 3 to 5 years. Some studies forecast that mobile solutions will be decisive, but we got less than 2% of the companies plan to deal with them in the next 3-5 years. The megatrend in digital technologies, like the advent of artificial intelligence, influenced the companies to have projects in AI in the next 3-5 years. It looks surprising that IoT solutions are not in the focus in the long term; however, they could provide data for AI solutions. The Hungarian results are different from the international ones (Kane, 2016) where analytics, IoT, mobile solutions have the top priority. It is surprising; the highest priority (AI) is interesting only for the 15% of the companies.

4.4 The role of IT departments in digital transformation

The most frequent roles of IT departments in the analysed companies are related with the IT project management, information systems security, providing proper infrastructure and providing user support (including training, assistance and advice on the use of tools and IT solutions, troubleshooting).

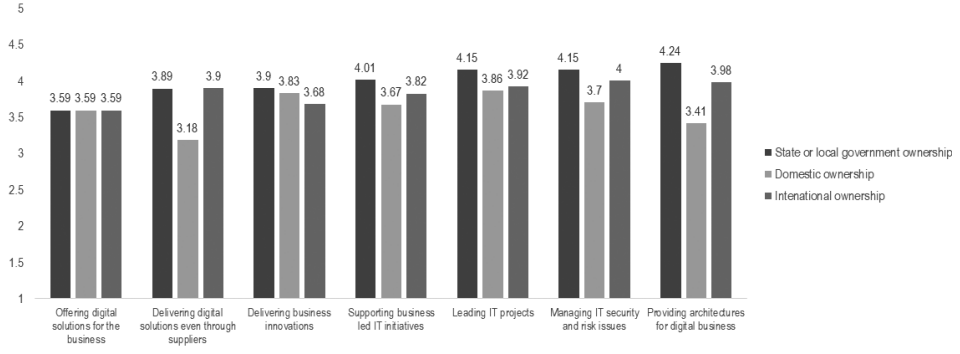
Figure 14: *The role of IT departments*



Analysing the role of IT departments by ownership (Figure 15), we can identify that the highest expectations towards internal IT departments can by identified in the case of public sector organizations. The dependency on IT departments in public organizations relies on the lack of digital capabilities in other departments. In business organizations, this dependency is weaker. In domestic companies, the expectation toward professionally

leading IT projects is the strongest, but the delivery expectation with suppliers is surprisingly weak. Domestic organizations tend to focus more on internal than external solutions.

Figure 15: *The role of IT departments in digital transformation by ownership (on 1-5 Likertscale)*

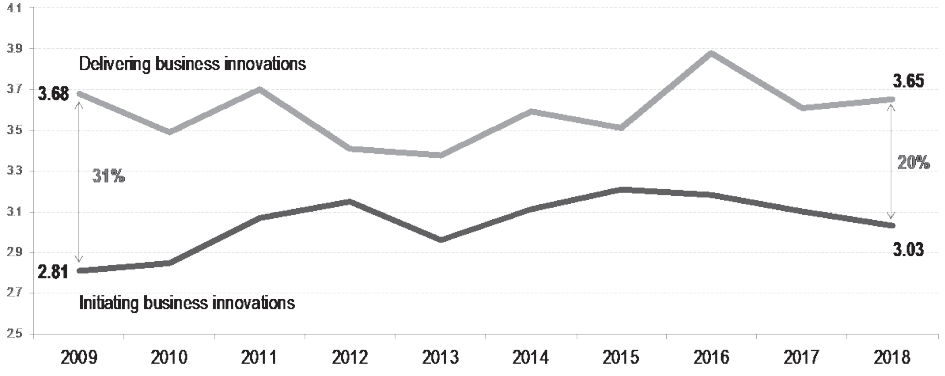


The position of the IT manager and the allocation of the IT function in the organization structure are of strategic importance. Most of the participating companies have an IT unit reporting to the CEO, which indicates a high-level integration of IT and acceptance of its strategic role. Close to 58% of the respondents reported this practice. In another typical arrangement, a functional unit supervises IT. According to the traditional approach, IT function is controlled by the operations manager, as reported by 20 percent of the organizations. In 14% of the organizations, the IT unit is reporting to the CFO, indicating the domination of cost-oriented approach – IT is costly and the financial unit can control it.

Large multinational companies, especially shared service centre structure, are defined by regional or global embeddedness, so the IT department is reporting to the manager of regional or central IT departments, rather than the representatives of the business units. Around 7% of the respondents reported this approach in 2017.

Based on the responses we observed, the strategic role of IT departments in competition is generally accepted. However, business functions still treat IT as a supportive background function.

Figure 16: *The role of IT in business innovation (on 1-5 Likert scale)*



Interestingly, an opinion on the innovative and implementing role of information technology is evolving. While domestic companies are seeing a gradually decreasing role of IT as an initiator for innovations, the perception of the implementation-oriented role has been steadily declining since 2013, with a few waves. In the case of digitization and digital transformation initiatives, the role of the IT function is implementation rather than innovation (Figure 16). Developing digital solutions for the company can be difficult if IT leaders are not involved in the management of ICT.

This problem is also reflected in the relationship between the organizational and IT strategy. Almost 77 per cent of companies reported that they are preparing an IT strategy, the duration of which is 3 years in two-thirds of the companies. In IT strategy-making organizations, 51% of corporations have the IT strategy as a part of the business strategy, and 26% make an independent strategy for IT. 13% of companies prepare only a corporate strategy, and 10% have neither business nor IT strategy. The results of the survey show a positive impact of maturity in IT planning and alignment on developing digitalization plans.

5 CONCLUSION

This paper discusses the digital transformation in Hungarian companies from various aspects. We investigated the position and objectives of digital transformation in Hungarian companies and analysed the role of IT departments in digital transformation. The state of digital transformation in Hungarian companies from the dimensions of strategy, technology and digital innovation capabilities was studied as well. The research belongs to an ongoing research, in which IT-related practice of Hungarian organizations has been analysed on a yearly basis, since 2009. This year, 167 organizations (small, medium and large companies) participated in our study. The most common objectives for digital transformation are increasing efficiency and improving customer experience and

engagement. Digital technology is considered as an opportunity or choice; we investigated it considering the literature and the previous years' research experiences. This year (in 2018), mobile, cloud and enterprise communication solutions are the top three ones, while blockchain, 3D printing and VR/AR (virtual reality/augmented reality) are the least important technologies, similarly to Kane's et al. (2016) results. Technologies in the next 3 to 5 years are different than the current ones and the ones in the next 1 to 3 years. Artificial intelligence, VR/AR and blockchain are the top ones.

Investigating the way of strengthening digital innovation capabilities, it was revealed that the main source is operational data (in 67.2 per cent of the Hungarian surveyed companies), meaning that companies are collecting, processing and analysing operational data. Developing digital capacities of existing employees and consultants are also common sources, but firms rely on consultants too. Most of the companies (60%) deal with digitalization related issues as a part of business planning, while around 20% integrate digitalization into the traditional IT strategy. Most companies manage digitalization at the strategic level, but there is still a large group of firms that consider digital transformation related issues as pure IT problems.

As our survey results revealed, there is a moderate-strong demand for digital transformation, but the consciousness and perception of how technology will change the nature of business varies among industries. Although the objectives of digital transformation are clear, companies heavily lack preconditions for successful transformation. They prefer matured technologies, such as cloud or mobile, and data management related technologies, while new risky or niche technologies are taken on cautiously.

To summarise, organizations in Hungary should focus on better preparation for digital transformation in the forthcoming years, including the identification of prerequisites and clarifying the role of IT departments in this process.

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