Udvari B. (ed) 2020: Proceedings of the 4th Central European PhD Workshop on Technological Change and Development. University of Szeged, Doctoral School in Economics, Szeged, pp 45–60.

Promotion of an Industry: Trends and Expectations of Digital Transformation in the Hungarian Business Services Sector

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In this paper, we explore the current trends of and future expectations for digital transformation projects in Business Service Centres (BSCs) in Hungary. We carried out fifteen interviews with senior technology experts and executives in three Hungarian based BSCs of multinational parent companies to examine individual transformation projects. We also used quantitative data from large-scale surveys on the sector to get an overview of general practices. We reviewed the use of advanced technologies like robotic process automation, predictive analytics, chatbots, and artificial intelligence. We found that BSCs had mostly The consequences automated massively repeated processes and that this automation had liberated employees for more creative tasks. of this transition are threefold: (1) BSCs can reinforce their position as business partners of their global parents, (2) creative assignments are more attractive for prospective and current employees in a labour market characterized by a shortage of suitable personnel, (3) employees usually do not fear the possibility of job loss due to automation and digital transformation.

Keywords: service sector, business service centers, digital transformation, robotic process automation

1. Introduction

The expected effects of the 4th Industrial Revolution have been attracting increasing attention from researchers in economics, sociology, and organization studies. A critical combination of information technology, biotechnology, and robotics seems to be the most important driving force for the revolutionary changes around and ahead of us. Although not implied as such by the umbrella term 'Industry 4.0', digital transformation and automation are also substantial sources of competitive advantage for companies in the service sector. As the business service industry employs more than 50,000 people in Hungary and provides 1.2% of national GDP and 1.6% of exports alone, it is considered significant for the national economy (Drótos et al. 2018). Therefore, digital transformation in the industry and its effects on competitiveness and labour market trends require further examination.

With our research, we set out to explore current tendencies and future expectations for digital transformation in Business Service Centres (BSCs) in Hungary. To accomplish that, we investigated the following questions. Which advanced technologies are the most prevalent in BSCs? What are the motivations for and expected gains from automation? How do digitalization and automation affect their strategic positions? What tasks and processes get automated most frequently? What is the general attitude of employees towards automation? How do managers of BSCs attempt to shape and influence employee attitudes?

To answer our research questions and give a comprehensive understanding of the subject, we pursue the following line of thought. First, we propose a theoretical framework for digital transformation in BSCs, 'Business Services 4.0'. In this framework, we encapsulate the challenges and solutions offered by digital technologies in BSCs as well as indications of how these affect corporate strategies and development projects. We then present the overall trends of automation and digitalization in the business service industry in Hungary. Analysed data was collected in cooperation with the Hungarian Service and Outsourcing Association (HOA) and the Hungarian Investment Promotion Agency (HIPA). Next, we present the results of our interviews carried out in three different BSCs based in Hungary. Finally, we summarize our conclusions and propose directions for further research.

2. Theoretical framework

Due to their significance in the global supply chains of multinational companies, an increasing number of researchers are investigating the operation and strategy of BSCs. Digitalization and automation also have their stream of literature, with numerous management, information systems, and information technology journals dedicated solely to these subjects. Therefore, to understand the context of a Business Services 4.0 framework, we first give an overview of essential concepts related to the business services industry and digital transformation.

2.1. Concepts of business services and digital transformation

Business services are services that are primarily consumed by organizations. Based on input, outcome, and added value, we can establish two major categories for them: knowledge-intensive and operational services (McKinsey Global Institute 2017a). The former category includes functions such as accounting, corporate finance, research and development, and other professional services, while the latter comprises activities like facility management, temporary employment services, and contract staffing.

Corporations that provide business services are called Business Service Centres. BSCs are either independent of their client companies concerning ownership and management (i.e., outsourcing), or they are affiliates of a corporate group. In the latter case, they provide various activities and processes for other companies in the group. Their performance is usually assessed based on their output and efficiency, and measured by comparison to market prices.

The business services sector in Hungary has been growing steadily over the last decade, both in times of crisis and prosperity. It employs an increasing number of people, most of whom hold a college degree (Drótos et al. 2018). As 48% of BSCs have been present in Hungary for more than 11 years, and another 20% of them present for 7–10 years, the sector is considered to be mature. Due to automation (Lacity–Willcocks 2015b) and the appearance of advanced technologies, the whole industry seems to be moving towards higher added value creation and a more sophisticated business model.

Although neither automation nor digitalization is a new concept or phenomenon in business organizations, their volume and effect have become so significant that we can call it a new wave of digital transformation (Demeter et al. 2019, Losonci et al. 2019, Nagy 2019). In most manufacturing companies, automation preceded digitalization (e.g., assembly lines in Ford's factories). In BSCs, however, we see a reversed order: companies usually digitalize their processes first (by using document management and workflow systems) and automatize them later.

Digital transformation broadly refers to a change of organizational strategies, structures, processes, and business models in which digital contents and advanced technologies play a crucial role (Füzes et al. 2018, Hortoványi–Vilmányi 2018). Through this, companies strive to advance their adaptability and agility to keep or acquire a competitive advantage. Digital technologies now appear in every business function, changing the ways of operation and the means of value creation (Horváth–Szabó 2017).

According to Sebastian et al. (2017), digital strategy, the carrier of digital transformation may be understood as "*a business strategy, inspired by the capabilities of powerful, readily accessible technologies (like SMACIT), intent on delivering unique, integrated business capabilities in ways that are responsive to constantly changing market conditions*". They use a strategic management perspective and focus on organizational capabilities to emphasize the urgent need to adapt to an ever-changing competitive environment.

Digital transformation does not mean solving old problems with new technology: it may instead be understood as re-thinking old problems while considering novel possibilities (Andriole 2017). Even though the tools of technology are essential, it is the capability of their innovative use and combination that may result in lasting competitive advantage. In this way, digital transformation is the rethinking and renewal of the organization itself, and thus might not be implemented without the transformation of the human workforce (Eden et al. 2019, El-Khoury 2017).

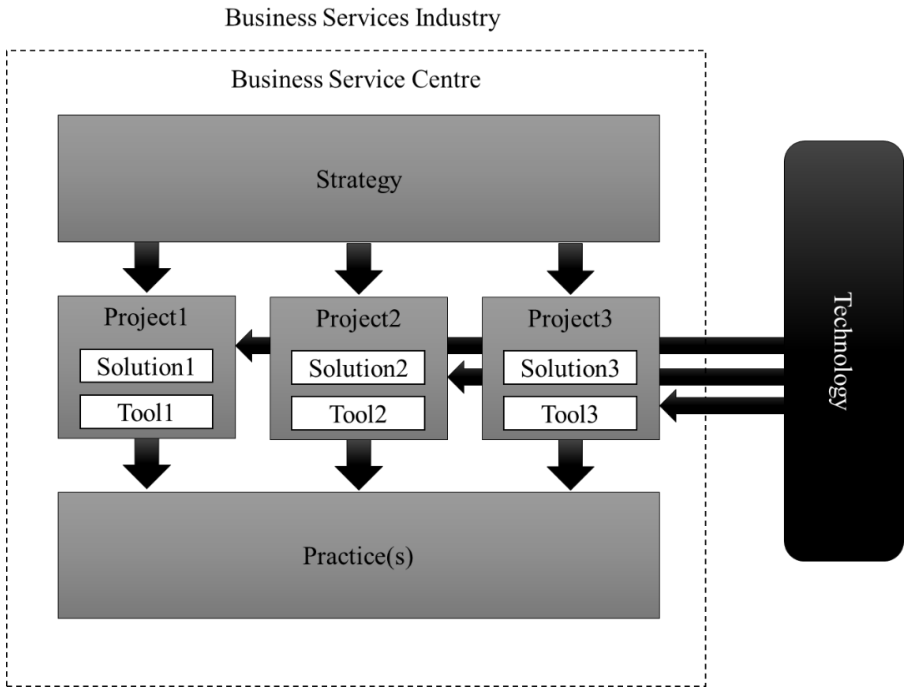
Digital transformation in the business services industry can be understood as a series of different stages and steps: (1) *digitization*, (2) *digitalization*, (3) *automation*, and (4) *robotization*. Digitization means a transformation from physically extant (i.e., hand-written or printed) documents to digital contents (Bhimani and Willcocks 2014). This step leads to digitalization, which is the application of various technologies (e.g., workflow systems) to exploit possible gains from electronic management and operation of processes (Drótos et al. 2018). Once processes are modelled and operated digitally, they can be automated. Automation permits decreasing the level of human interaction required for process completion (A.T. Kearney Inc. 2017, Everest Global Inc. 2014, Winroth et al. 2007). Robotization explicitly refers to the application of technologies that can substitute for the human workforce (Kukreja, 2016, Lacity–Willcocks 2015a, Unger et al. 2018). These technologies are primarily either physical, or software robots that specialize in specific tasks and functions otherwise carried out by humans. Robotic technology is generally based on machine learning, cognitive systems, and different kinds of artificial intelligence.

2.2. Business Services 4.0 framework

After explaining the key concepts of business services and digital transformation, we present the Business Services 4.0 framework. Based on the idea of Industry 4.0 (Nagy 2019, Szabó et al. 2019), Business Services 4.0 refers to the complex phenomena of how advanced technologies appear in the service sector, change and reshape business models, processes, and overall corporate practice (Keller 2017). We have summarized the concept of Business Services 4.0 and its main elements in Figure 1.

Our units of analysis are Business Service Centres that are affected by both the competitive environment (other players in the industry) and the most recent technological trends. These inputs might change strategic directions otherwise suggested by their parent companies. Development projects are initiated based on strategic goals. These projects use various pieces of advanced technology to create organizational solutions that will eventually alter everyday practice.

Figure 1 Business Services 4.0 framework



Source: authors' compilation

Digitalization and automation are not entirely new phenomena in the service sector (Chui et al. 2015, Héder 2014). Scripts and macros were used in different software environments to replace frequent routine tasks. These solutions, however, are limited in use. First, they cannot or can only partially cross software boundaries (e.g., MS Excel). Second, they can only use structured databases for computing. Third,

they do not support end-to-end work processes as workflow systems do. Nowadays, robotic process automation (RPA) is the most widespread automation technology (Unger et al., 2018). It has already surpassed its predecessors as it can traverse its software environment, and use semi-structured databases for computing (Kukreja 2016). Robotic process automation technology encompasses software that is ready to support whole working processes and minimize human activity at each step.

Currently, cognitive automation (Davenport and Kirby 2015) represents the highest level of process automation. Armed with learning algorithms, it carries some aspects of artificial intelligence (AI). Cognitive automation can also process data from unstructured databases (McKinsey Global Institute 2017b). Chatbots, accessible and quite prevalent pieces of automation technology, make use of cognitive automation, for instance. Thanks to natural language processing, chatbots can translate spontaneously sentenced questions to queries of data. These questions can then be answered based on a database that is expanding continuously based on the questions asked.

Other technologies that we investigated in the Business Services 4.0 framework include enterprise resource planning (ERP) systems, business intelligence (BI) solutions, enterprise social media software, Big Data, and data mining. We also asked for data on the use of predictive analytics (PA), data privacy and security, simulations, service-oriented architecture, cloud computing, virtual or augmented reality, and machine to machine (M2M) systems. We found that amongst these technologies, ERP systems were the most widespread in the business services industry, although, many current and future development projects had aimed to implement workflow systems, RPA, and cognitive computing.

3. Methods

To explore digital transformation in the business services industry, we carried out a large-scale survey and several interviews with senior automation professionals and executives of BSCs. By doing so, we attempted to get an overall understanding of the industry, as well as to gain insight into motives, risks, and gains related to actual development projects. We present the process of data collection in both research phases below.

Data for our large-scale survey were collected in cooperation with the Hungarian Service and Outsourcing Association (HOA) and the Hungarian Investment Promotion Agency (HIPA). For the survey, all 110 companies operating in the business services industry in Hungary were asked to fill out a questionnaire focusing on general information, strategies and processes, employees, and technology. Seventy-one companies sent back their responses, which means a 64.5% coverage based on their absolute number and an 82.5% coverage based on total employee number (representing approximately 41,200 employees). Data for the survey was collected in autumn 2018. In some cases, responses can be compared with data from 2017 as a somewhat different version of the survey had been carried out in the previous year as well, however, with a lower level of coverage (60% based on the number of employees).

As most BSCs are located in Budapest this proportion was also apparent in our sample: approximately 80% of employees worked in the capital, while the others were located in Tier 2 cities (primarily in Debrecen, Székesfehérvár, Szeged, and Pécs). The parent companies of our respondents operate in various industries ranging from manufacturing (24%), through business services (15%) and telecommunications (10%), to energy (8%), IT (7%), and others. Further, most of our information providers perform other activities besides business services: other service activities (43%) or other manufacturing activities (21%).

Our survey sample appropriately covers the industry and adequately represents the population regarding the dimensions mentioned above. Therefore, our data can be used to describe general trends in the industry as well as cast light on similarities and commonalities among BSCs. Responses for some questions can be compared to those in the previous years as similar surveys had been carried out before with a slightly different focus and fewer respondents.

We carried out our interviews in three BSCs located in Budapest and Székesfehérvár. The companies were intentionally chosen according to the following criteria: variance in location, variance in the industry of parent company (manufacturing, IT), variance in the number of employees, and variance in technology adaptation strategy. In each case, we applied to managers of the companies with a request to support our research. Either they or their selected colleagues (senior professionals responsible for digitalization and automation projects) were then interviewed. The interviews usually took 1–1.5 hours and were semi-structured. We prepared a line of questions in advance, but as our main objective was to explore the corporate practice and learn about development projects, we sometimes deviated from the original items.

Table 1 Organizational function and affiliation of interviewees

Code	Organizational function	Company code
1	Managing Director	A
2	HR Services (external)	A
3	Procurement	A
4	Q2C (Sales Support)	A
5	Chief Information Officer	A
6	Indirect Tax	A
7	Accounts Payable	A
8	HR Transformation (internal)	A
9	Automation Team Lead	B
10	Global Compliance Lead	B
12	Security Lead	C
13	Expert Architect	C
14	IoT Portfolio Unit Lead	C
15	Managing Director	C

Source: authors' compilation

Table 1 shows a list of interviewees together with their organizational function and affiliation. Our fifteen interviewees are from three different companies (A, B, and C). Company A is in the information technology and services industry. It has its headquarters in Budapest and employs approximately 2,300 people. Company A has a global parent company with hundreds of thousands of workers worldwide. Company B operates in the manufacturing industry. Located in Székesfehérvár, it has about 500 employees. Its parent company is a global one, with a strong presence in Europe. Company C is also invested in information technology and services. It employs over 4,500 people at its Budapest headquarters. Company C is a subsidiary of a European multinational company with strong market interests in Hungary.

Each interview took between 1–1.5 hours. On some occasions, multiple interviewees were questioned at a time. All interviews were carried out by two or all three of us present. Notes and audio recordings were taken with the previously given consent of the interviewees. Recordings were transcribed by a research assistant and then reviewed and verified by senior researchers. Interview transcriptions were re-read several times during the research process to identify common themes and patterns.

4. Results

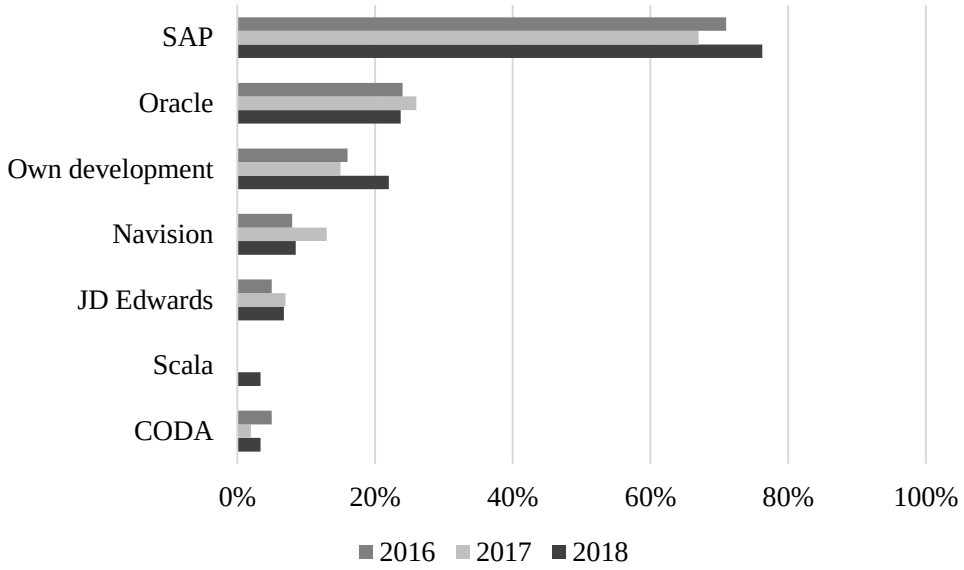
In this section of our paper, we first present the results of our large-scale survey; then we summarize the main messages and characteristic messages of the interviews. In the latter part, we give examples of specific development and digital transformation projects as well as meaningful citations from our interviewees.

4.1. Survey results

Technology has always played a significant role in the value creation of business services companies, but in the past few years, it became a key driver of growth and business development. An increasing number of BSCs have already implemented automation technologies, and even more of them are planning to do so. The operation of BSCs is becoming more streamlined than ever before: routine tasks are accomplished on a large scale with extreme efficiency. Automation of everyday tasks and use of integrated enterprise resource planning systems liberate the workforce for positions with higher added value.

Perhaps the most prevalent digitalization technology in the business services industry is enterprise resource planning (ERP). In 2018, 56% of our respondents claimed that they used a company-wide integrated ERP system, which is a 10-percentage point increase compared to the previous year. The most preferred ERP system providers are SAP and Oracle. However, more than one-fifth of BSCs, who use ERP, implemented their own developments (*Figure 2*).

Figure 2 Prevalent providers according to ERP system users – multiple choice



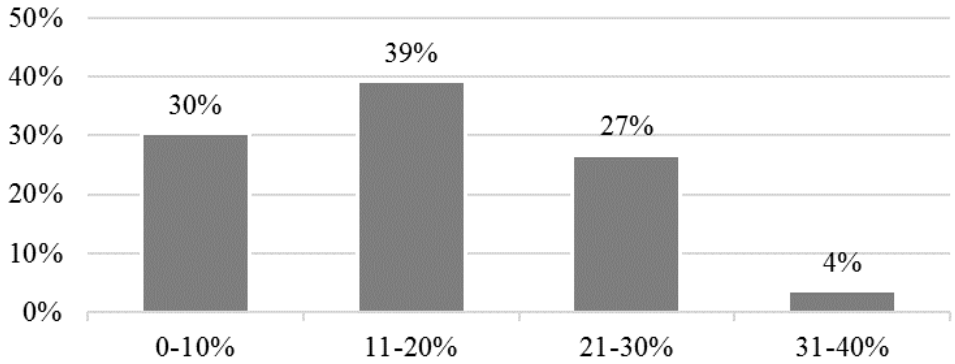
Source: authors' compilation based on survey responses

As BSCs deal with an extreme number of transactions, process automation seems a substantial means of reducing costs and lead time, while simultaneously increasing accuracy. Before automating specific processes or process steps, these should first be optimized or even re-designed to avoid any possible loss due to inadequate organization. Even so, it is usually difficult to fully automate processes that require data from different systems or that include non-routine elements. Thus, typically, human agents are kept to oversee, control, and connect separate process steps.

In the case of robotic process automation (RPA), however, software robots can completely substitute human agents in the entire process. Consequently, RPA proves to be even more beneficial in increasing efficiency and preventing errors. The main barriers against placing software robots in most administrative procedures remain their relatively high price as well as their need for thorough training and testing.

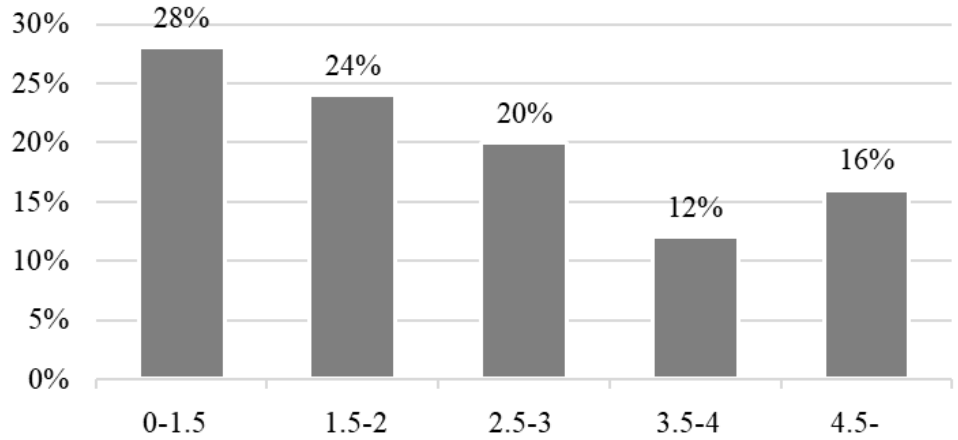
From the survey results, it becomes apparent that the motivations for and expected gains thanks to process automation and robotic process automation outweigh most objections. Considering possible cost savings on average due to automation technologies, most respondents (39%) expect 11–20% in savings (see *Figure 3)*. Approximately the same proportion (30 and 27%) of respondents are somewhat more or somewhat less optimistic, expecting 0–10 and 21–30% of average cost savings.

Figure 3 Expected cost savings on average in the next two years due to the use of automation technologies



Source: authors' compilation based on survey responses

Figure 4 Expected FTE replacement by one robotic unit on average



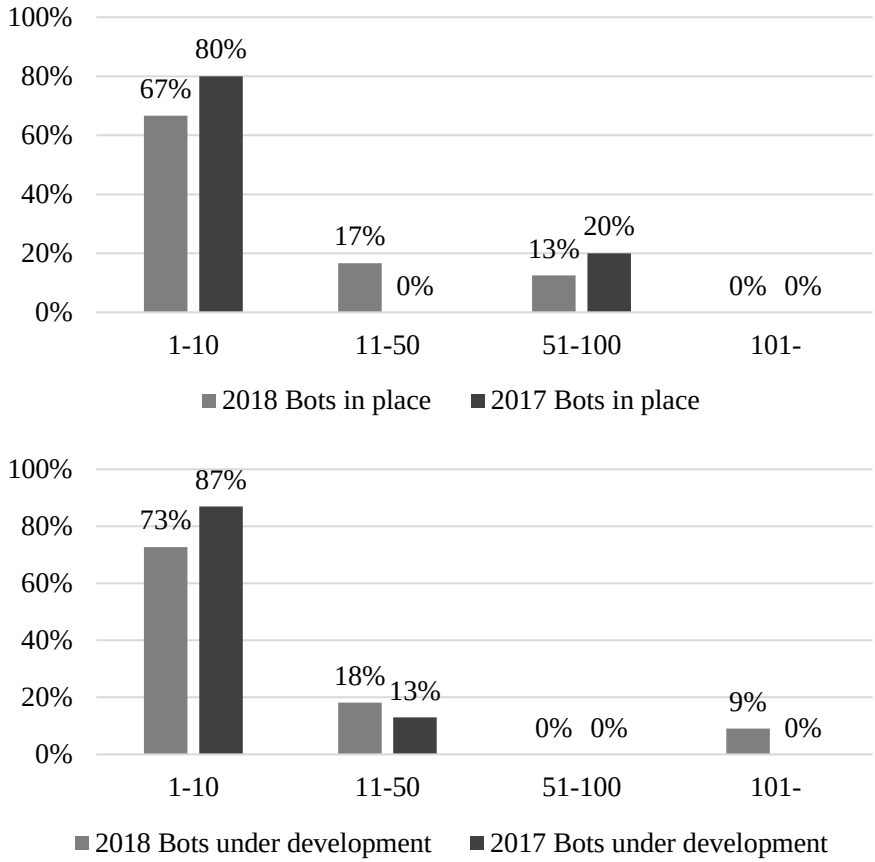
Source: authors' compilation based on survey responses

Regarding savings as full-time equivalents (FTEs) our respondents seem to be equally hopeful (see *Figure 4*). Although approximately half of them think that software robots may replace 0–2 FTEs per unit, half of them believe that 2.5 or more FTEs might be replaced. According to the most optimistic BSCs (16% of respondents), even 4.5 or more FTEs will be taken over by RPA technology. Differences in expectations might be due to divergent experiences during the testing phase and previous implementations, or as to dissimilarities in the properties of affected processes.

In 2018, 24 out of 71 BSCs responding to our survey claimed that they had already implemented RPA technology and had software robots in place or under

development. This meant an advance both in the number of companies using RPA and in the number of robots in place compared to 2017. In *Figure 5*, it can be seen that those players who formerly had had 1–10 software robots assigned to various processes, now moved for new implementations and are currently developing an increased number of new robots. Two BSCs (9% of respondents using RPA technology) plans to apply more than 100 new software robots in automated processes soon.

Figure 5 Number of software robots in place and under development in 2017–2018



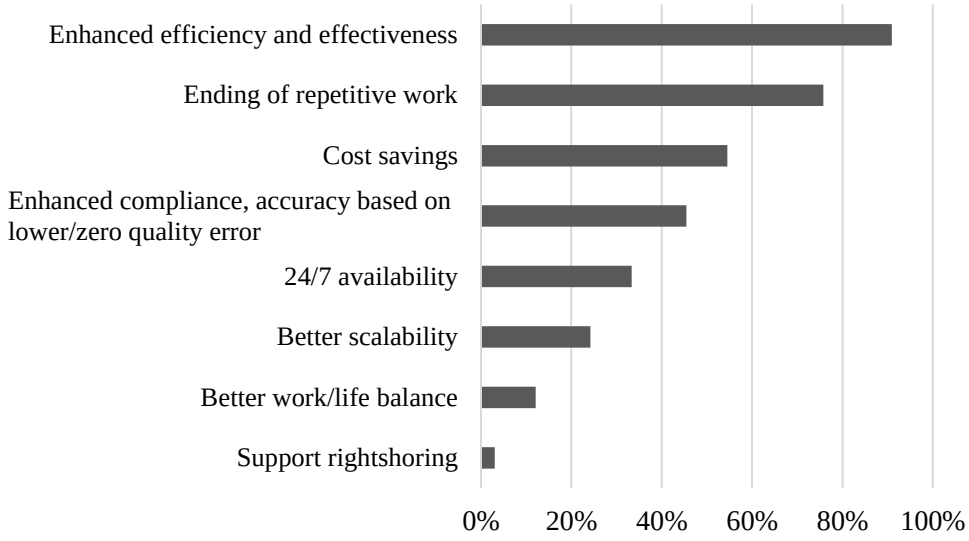
Source: authors' compilation based on survey responses

According to our respondents, the four most frequently mentioned criteria for selecting an automation technology vendor were (a) security and reliability (73%), (b) possibility of integration into extant IT environment (62%), (c) overall ease of implementation (62%), and (d) availability of global support. Concerning these criteria, among others, BSCs predominantly chose BluePrism, UIPath, and Automation Anywhere as automation technology vendors.

In most cases (38%) RPA is run in the cloud on own servers or premise-servers (28%). If using RPA solutions, most BSCs have 1–5 (35%) or 6–10 (35%) processes in scope. However, there is a committed segment (15%) who have over 51 processes currently automated by RPA.

Enhancing effectivity and efficiency, as well as cost savings, are the most important benefits of using RPA technology in BSCs. Apart from these, however, other expected advantages emerge: the amelioration of service levels (like zero error, better compliance, and all-time availability) as well as the relieving end to repetitive work, and because of this, a better work-life balance (see *Figure 6*).

Figure 6 Most important effects and benefits of using RPA in BSCs – multiple choice



Source: authors' compilation based on survey responses

Reducing the proportion of repetitive tasks in employee workload might be the main argument why most employees have an overall positive attitude towards automation. According to corporate respondents, 87% of them do not experience human resistance against developing and implementing automation tools within their organizations. Individual employees were also asked about their viewpoint: according to 566 employees from various BSCs, only 2% of them claimed that software robots would completely take over their jobs. A further 47% believed that parts of their jobs would be carried out by robots, while 42% of them thought that their current jobs would not be affected by RPA (the remaining 9% did not know or did not answer).

While this degree of optimism concerning the indispensability of the human workforce in various jobs seems to be precipitant, it certainly signals that managers of BSCs have been able to convince their employees. Reasons for this and the main arguments of official communication on automation will be presented in the next section of this paper, based on interview results.

4.2. Interview results

In this section, we present specific automation projects implemented in the three organizations in which we interviewed managers and automation experts. We also introduce common patterns regarding motivations of automation, its effects on corporate strategy, and official communication.

During the interviews, our general observation was that managers certainly embrace the idea of automation. As Interviewee 10 from Company B pointed out: "Being a service centre, our performance is measured by cost levels and the volume of tasks accomplished. We are expected to take over further activities from the core business areas while keeping the same cost levels. That would be impossible without automation and robotization." Other interviewees agreed, claiming that global management either articulates specific development requirements or declares savings targets. Company A, for instance, globally sets a so-called "annual challenge" every year, which means on average a 10% savings target to accomplish. As Company A is a market leader in multiple product lines, these challenges prevent it from getting too comfortable. Continuous improvements in efficiency are needed to match these requirements. Thus, in many cases, managers of BSCs face a dual challenge of successfully reducing process costs while taking over more and more tasks, and simultaneously maintaining quality standards.

Interviewee 9 from Company B said that when agreeing on taking over new tasks from business lines of the corporate group, they attempt to design possible automatization of them. "What you cannot automate; you should not take over." Interviewee 9 added that business needs to lead the automation processes, while IT merely attempts to catch up with. "IT systems in the company are very fragmented. The IT department is understaffed and struggles to integrate new applications in legacy systems as well as to lead new development projects. So, it is up to us to choose vendors and implement changes. However, when we are done, they want to take control."

As Company A and C operate in the information technology and services industry, IT departments not only provide functional support but co-create their main products. Thus, automation and robotization projects get more support and can even rely on their own IT solutions if available.

Company A, perhaps the most mature in the digital transformation of the three BSCs examined, is involved in dozens of more significant and hundreds of smaller automation projects. Project size is based on investment and workforce need: a project that requires 200–1,000 workhours is considered small, while a project that needs 1,000–5,000 are medium, and 5,000–20,000 are large. A smaller project had been the implementation of a chatbot that could answer questions related to the company's new travel system. After opening the new systems, employees got video and written learning material on how to use it. Much of the time, however, they did not put effort into processing these materials and preferred to ask IT-colleagues instead. Thus, they put a chatbot in use with natural language recognition that can understand human speech as well as written questions, translate them to data queries and answer accordingly. As the database behind the language interface of the chatbot was

expanding with every new question, at some point, it grew capable of giving very accurate answers – saving time for IT personnel.

Another exciting project was their implementation of RPA technology in procurement requests to procurement order in Company A. Two types of procurement orders are classified as "hands-on" or "hands-free". The first one refers to orders that are unprecedented or for some other reasons should be negotiated with the provider, while the latter one refers to orders with a previously accepted general contract with the supplier. Hands-free procurements had already been automated for some time, but hands-on procurements required much human workforce to complete. Thus, RPA technology was introduced in case of hands-on purchases. Two software robots were needed for the process from end to end. The first one filled out a procurement order creation form after gathering data on same or similar orders for the same product, country, and supplier. The second one scanned the contract database, categorized suitable partners, and pulled data to PO form to complete it. Eventually, human interaction is still needed to approve orders. Robots would likely be able to do that as well, but as Interviewee 3 explained, special certificates would be needed for that, as decision-making and financial responsibility of robots is still a complicated legal issue.

According to our interviewees, other technologies like blockchains, cognitive systems, and artificial intelligence are also on the horizon but are still too expensive, unreliable, and under-studied for them to implement in the short term. As Interviewee 15 from Company C pointed out: "We have dreams to accomplish, but very few industries have the required capital in Hungary or in the countries our parent companies operate in. However, what is *dreamable* will soon be doable."

Until then, it seems that BSCs will continue to re-organize, automatize, and then robotize routine (and eventually non-routine) processes. Managers of BSCs, however, manage to frame these changes as a relief for employees who will be less loaded with monotonous tasks and will gain time for more creative and challenging activities. They have a good reason to think so: the number of tasks that business lines are willing to hand over to them seems to be almost infinite. So, they are confident that robots will not completely replace their employees.

Official communication on automation projects and digital transformation is also capitalizing on the argument that the human workforce will be liberated from routine tasks that will let them do more meaningful and more gratifying jobs. As Interviewee 3 mentioned, it might be the case that a particular employee is not suitable for tasks requiring higher levels of creativity and problem-solving. He underlined, however, that it is their very conscious decision not to dismiss anybody because of automation – as it would cast shadows on further development. If a department acquires a workforce surplus, they order a hiring freeze and "natural fluctuation generally solves the problems in a few months".

According to Interviewee 1, 10, and 15, senior managers of their companies, the automation of routine tasks will not only put employees in better positions but will promote the industry itself. As BSCs are carrying out tasks with increasing added value and a growing need for creativity, they can position themselves as *business partners* rather than mere suppliers in the global supply chain of their corporate

groups. This may result in an increasing number of BSC managers receiving seats on the board of parent companies, better-negotiating positions, and greater prospects of future growth. As the business services sector is already a significant and steadily growing industry in Hungary, increased value creation of BSCs might have an overall beneficial effect on the economy: growing exports and tax revenues, as well as higher salaries, seem to be achievable targets.

5. Conclusions

In our paper, we analyzed the current trends of digital transformation projects in BSCs operating in Hungary. We introduced our theoretical framework for Business Services 4.0, a concept encapsulating the interrelation of technology, strategy, and organization in Business Service Centers (BSCs). We presented the overall picture of the industry based on quantitative data from large-scale surveys. We also presented the results of fifteen interviews with senior technology experts and executives carried out at three Hungarian based BSCs of multinational parent companies to examine individual transformation projects. We reviewed the use of advanced technologies like robotic process automation, predictive analytics, chatbots, and artificial intelligence.

We found that BSCs had mostly automated massively repetitive processes and that this automation had liberated employees for more creative tasks. Based on general trends and expert opinions, we argue that the consequences of this transition are threefold. (1) BSCs can reinforce their position as business partners of their global parents. This not only puts employees in a better position but opens the way to promote the whole industry. As business services is already a significant sector in the Hungarian economy, we argue that further economic benefits might arise from the digital transformation of the industry.

(2) Creative tasks are more attractive for prospective and current employees in a labor market characterized by a shortage of suitable personnel. As the business services sector is steadily growing, its need for more employees means a constant challenge for hiring. BSCs have already absorbed their prime targets from the labor market (young college graduates with excellent language skills); they will probably compete with other sectors for the workforce. Creative and meaningful jobs will likely be a key message when re-thinking their employer brands.

(3) Employees usually do not fear the possibility of job loss due to automation and digital transformation. Based on our research, this self-confidence is often well-grounded, although, in certain individual cases, employees will probably need to be re-educated. Considering all the possible gains and losses, we argue that the digital transformation of the business services industry is expected to have an overall positive effect on both organizational and national levels.

Based on the findings of our survey and interviews, we found that multiple arguments of previous research are also correct in the case of Hungarian BSCs. We observed that technological tools and solutions that are usually regarded as the leading force of Industry 4.0 (Bhimani and Willcocks 2014, Kukreja 2016), are also present

in many BSCs. Similar to other research cited in our study, we found that digital transformation happens through different stages that are built upon each other. With our study, we also reinforced arguments (Eden et al. 2019, El-Khoury 2017) that the digital transformation of companies requires the transformation of the workforce. More creative and more knowledge-intense jobs can only be done by competent and educated employees who can learn and adapt. As BSCs traditionally employ college graduates, this is easier for them – as confirmed by our survey.

Acknowledgments

This research was supported by project No. EFOP-3.6.2-16-2017-00007, titled *Aspects on the development of intelligent, sustainable, and inclusive society: social, technological, innovation networks in employment and the digital economy*. The project has been supported by the European Union, co-financed by the European Social Fund and the government of Hungary.

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