

Stakeholders of Digitalization and Digital Transformation in Slovakia

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Abstract

Digitalization and digital transformation certainly belong to the main trends that affect business organizations, entire business sectors as well as whole economies. While digital transformation of a business is clearly a firm-level event, it never happens in a vacuum, as external drivers also play a significant role. Thus, it is important to understand the national-level context and the subjects therein. Therefore, the aim of our paper is to review the concepts related to digitalization and digital transformation stakeholders, adapt the stakeholder classification to the context of Slovakia, and identify the examples of stakeholders in our national setting. In doing so, we review the academic literature, policy documents and professional and practitioner documents dealing with the issues of environmental context and its actors (i.e. stakeholders) relevant for digitalization and digital transformation of a business organization. Based on this, as a result of our paper, we propose a conceptualization of digitalization and/or digital transformation stakeholders, and we apply our conceptualization to map the complex multi-stakeholder system in Slovakia and highlight its main actors. Our findings contribute to the emerging body of knowledge in this field in Slovakia, both in academic as well as in practitioner context.

Keywords: business; digitalization; digital transformation; stakeholders; Slovakia.

JEL Classification: L22, L26, O33

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1 Introduction

Digitalization and digital transformation belong to the most important trends in business sector in the context of recent socio-economic and technological development. Also, digitalization and digital transformation proved out as efficient responses to the recent COVID-19 crisis (Stephan et al., 2021) that paralysed many traditional ways of doing business worldwide. For example, in Slovakia, more than a quarter of both small and medium-sized businesses, and one-fifth of large firms reported an increase of their online business activity in response to the pandemic (World Bank, 2021). Thus, it is no surprise that this phenomenon attracts an increased attention of policy makers, practitioners, researchers and, most of all, businesses themselves. Alike many areas under rapid development, also digitalization and digital transformation do not have an established terminology, and the jargon of subjects involved often uses these terms interchangeably, not following the rigorous definitions. In the presented paper, while we use both these terms due to our perspective and research interest, we at the same time intend to recognize and respect the distinction between them.

Digitalization and/or digital transformation of a business entity is operationalized with a business-centric (rather than technology-centric) perspective, focusing on products, processes and/or organizational aspects (Matt et al., 2015). While it is clearly a firm-level event, it never happens in a vacuum. Contrary, it is often driven also by external factors (as already argued above) alongside the internal drivers, and it is facilitated by multiple external environment subjects. Also, the current research on business firm digitalization and/or digital transformation often focuses on the external factors or subjects (e.g. Ismail et al., 2017; Pelletier and Cloutier, 2019). Due to the comprehensive nature of digital transformation of a business organization, there are many subjects that are important for its success. These vary depending on the size and orientation of the enterprise and the type and scope of the transformation. However, some fundamental stakeholders can be found in almost every project of digital transformation. Next, policy makers and entrepreneurship support providers at EU as well as national levels underline digitalization and/or digital transformation as one of the highlights on their entrepreneurship agenda. In line with this perspective, we focus on external stakeholders on national/regional ecosystem level in our investigation. At the same time, in the presented paper, we intentionally abstain from intra-firm actors and stakeholders that are subjects of interest of the firm-level perspective on digitalization and/or digital transformation. However, as our focus remains on a national level, we depart from this perspective.

We share an opinion that conducting a mapping of digitalization and/or digital transformation stakeholders in Slovakia can contribute to the debate in this field in our country. Also, as we found no similar work addressing the Slovak context, we believe that our findings can fill the gap in the literature nationally, and contribute to the debate in an international academic context. Therefore, the aim of this paper is to review the concepts related to digitalization and digital transformation stakeholders, adapt the stakeholder classification to the context of Slovakia, and identify the examples of stakeholders in our national setting.

2 Material and methods

The presented paper employs the grounded theory method to conduct a qualitative, secondary data- and literature-based research with an aim to conceptualize the stakeholder classification in relation to digitalization and digital transformation of business organizations. Proposing the stakeholder classification will be based on a review

of academic literature, policy documents and professional and practitioner documents that deal with the issues of environmental context and its actors (i.e. stakeholders) relevant for digitalization and digital transformation of a business organization. Then, the classification developed will be applied to the context of Slovakia, and its fit with the national setting will be tested by identifying particular actors.

To identify the stakeholders of digitalization and digital transformation of business organizations in Slovakia, we conducted a thorough examination of a complex multi-stakeholder system related to entrepreneurship and digitalization and/or digital transformation in Slovakia. In specific, we focused on evolving digital business environment with an emphasis on key drivers and interactions of groups of stakeholders in the field. There are many groups of interest who are important for successful digital transformation. These vary depending for example on the size and orientation of the institution and the type and the scope of activities that affect digital ecosystem. In this case, we focused on identifying fundamental stakeholders groups that represent stakeholders relevant for various aspects of digitalization and digital transformation. In the Results section, we present concrete examples that may come close to illustrate the stakeholders in Slovakia and validate our conceptualization.

3 Results

The aim of our paper was to review the concepts related to digitalization and digital transformation stakeholders, adapt the stakeholder classification to the context of Slovakia, and identify the examples of stakeholders in our national setting. Thus, in the first part of the results section, we present our conceptualization of the stakeholder classification in relation to digitalization and digital transformation of business organizations. Then, in the second part, we present the results of our mapping undertaken in Slovakia in form of specific examples of stakeholders using our classification.

Our review of literature related to the issues of environmental context and its actors relevant for digitalization and digital transformation of business organizations mostly came across resources grouped in the following areas: factors and drivers of digitalization/digital transformation (e.g. IDN, 2019; Morakanyane et al., 2017; OECD, 2019; Osmundsen, 2018; Verhoef, 2021; Vodafone, 2020), digital ecosystems and digital innovation districts (e.g. Brunetti et al., 2020; Li et al., 2017), policy support towards digitalization/digital transformation (e.g. OECD, 2021a; OIR POSDRU Bucharest-Ilfov, 2021), consultancy services and expertise related to digitalization and digital transformation (e.g. BCG, 2019; Deloitte, 2018; Diana and Torrance, 2019). Thus, we extracted various types of stakeholders that informed our conceptualization from these resources. The conceptual framework of business organizations' digitalization and/or digital transformation stakeholders is presented in Figure 1, while the individual categories are described below.

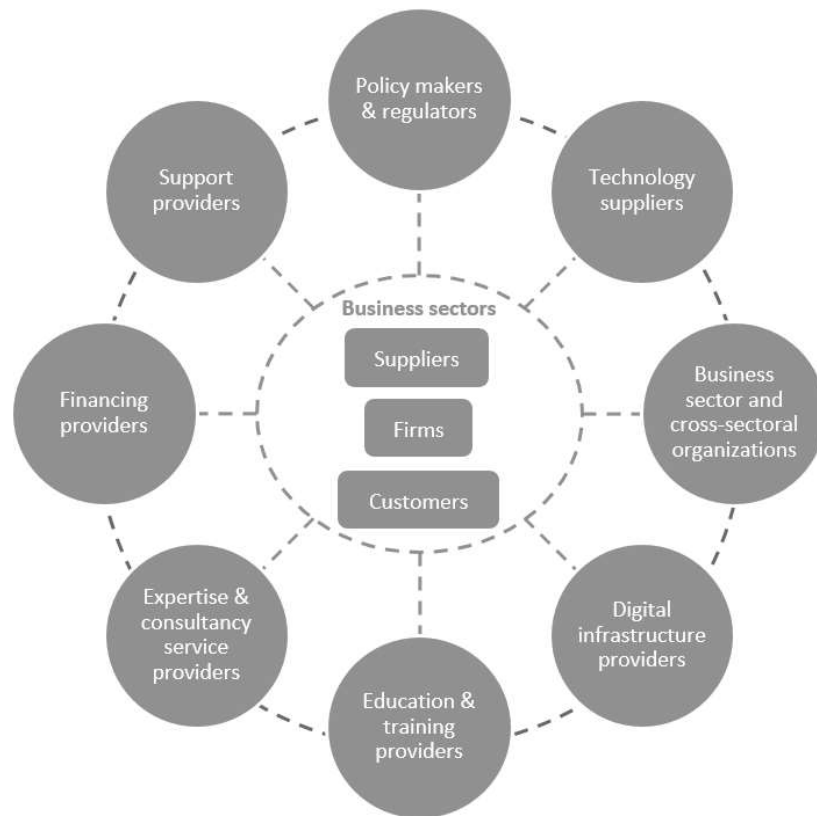


Figure 1 Digitalization and/or digital transformation stakeholders; source: own elaboration

Policy makers & regulators. In their actions, policy makers shape the framework for digital transformation and design policies aimed especially at strengthening capacities in new digital technologies, opening new opportunities for businesses and consumers, supporting the green transition, supporting people's digital skills and training for workers, and helping digitalize public services, while ensuring the respect of basic rights and values. The recent pandemic and related crisis have accelerated these initiatives even further.

Special role of EU and governments' interventions in relation to digital transformation is played by regulations and regulatory interventions. These sometimes can drive the digitalization and digital transformation of companies, as these might be pushed to transform their way of doing business or their organization in order to comply with regulatory changes (Osmundsen et al., 2018). Thus, regulators are definitely relevant stakeholders of digitalization and digital transformation.

Technology: Suppliers and Digital infrastructure providers. Digital technologies play crucial role in digitalization and digital transformation process of business organizations. Of course, technologies will not drive the transformation process themselves, but they must be coupled by certain firm-level factors, such as culture, strategy and digitally savvy staff (Morakanyane et al., 2017) as well as by awareness of their availability (Vodafone, 2020). Yet, the presence and availability of digital technologies are an important and necessary precondition. The key categories of digital technologies relevant to business digitalization and digital transformation are connectivity, process digitalization and automation, cloud, online presence, collaboration

and communication (Vodafone, 2020). Access to these digital technologies are facilitated especially by two categories of stakeholders: infrastructure providers and technology providers.

The digital infrastructure providers develop and operate both physical (i.e. digital connectivity, data centres, 5G) as well as online digital infrastructure. The latter includes for example cloud computing capacities or digital platforms for e-commerce. The platforms substantially increase businesses digital presence, their outreach and network capacity in sourcing and selling, and facilitate their access to distant markets, thus enabling, besides others, the raise of so-called born-global enterprises (OECD, 2019).

The technology providers offer products and services fostering the implementation of digital technologies in everyday business activities. Their offerings include digitalization solutions for various business processes, marketing activities, services related to gathering, storage and analysis of data for decision-making and management practices (incl. Big Data and AI solutions), solutions based on Blockchain and Distributed Ledger Technologies, or FinTech solutions (e.g. mobile banking, crowdfunding, etc.) (OECD, 2019). Also, technology providers often enable affordable access to cutting-edge technologies in manufacturing, thus enabling the implementation of Industry 4.0 (IDN, 2019).

Support providers. Support providers are uniquely positioned stakeholders, typically established or supported by national or local governments and linked to the policy level, with a mission to provide support and advice to companies that are driving toward digital transformation. Within their mission, they build awareness among businesses, they help to navigate businesses through the environment and local ecosystem towards opportunities to benefit from partnerships and other support offerings, such as financing. Also, they often undertake activities aimed at enhancing firm-level digitalization and digital transformation drivers, such as deployment of digital technologies, reskilling and upskilling towards digital competencies, or development of digital strategies and business models. Finally, they can also provide support for creation of SME-tailored digital solutions, enhance experimentation platforms and networking programmes (OECD, 2021a). Also, intermediary organisations (some of them also non-governmental), such as incubators, accelerators, mentoring organisations, development agencies, fab labs, or innovation agencies can provide guidance, inspiration, open spaces and digital tools to support businesses in their digitalisation efforts (EU, 2016).

Business sector organizations (industry-specific and cross-sectoral). An important stakeholder group in supporting business digitalization and digital transformation are sectoral and cross-sectoral organizations, such as different industry associations, entrepreneurs' associations, chambers, or cluster organizations. These organizations represent platforms where members can network and share their knowledge and experience, they help them to coordinate their efforts when representing interests towards policy makers and regulators, and they might also implement digital capacity building initiatives, help to develop digitalization standards, recommended practices and guidelines, and reference good practices in digitalization and digital transformation implementation.

Financing providers. Financial resources are one of the internal enablers of digitalization and digital transformation of business organizations (OECD, 2019). The financial aspect is one of the elements of the digital transformation strategy of any business, as it both drives and bounds the transformation, and it might also put pressure on a company leading to higher perceived urgency to act (Matt et al., 2015). Thus,

financing providers also play an important stakeholder role. Their importance is even higher in contexts where available internal resources are scarce. Access to financial resources (own or external) is supposed to be one of the preconditions to initiate and accomplish digitalization and digital transformation of businesses in developing regions. Here, companies often face challenges of insufficient own resources, and especially grants and subsidies are sought as sources of financing investments in digital transformation (Benedikovic et al., 2017). Also, the role of financing bodies is crucial when it comes to digital technologies of strategic importance at the country or regional level, such as the case of photonics and microelectronics in the EU (EIB, 2018).

Expertise and consultancy providers. Expertise and consultancy providers in the field of digital transformation provide support in developing digital capabilities, strategies, culture and talents as crucial drivers because simply using digital technologies to drive the digital transformation process is not enough (Morakanyane et al., 2017). While digital transformation is often a necessity for modern businesses, embarking on a program of digital transformation without expertise is very difficult and risky, considering the many potential pitfalls along the way, whether that's dead-end technology or improperly implemented systems. For the largest consulting companies providing professional services, technology consulting is a relatively new area, but it is becoming an increasingly important element of their offer. Besides these, there are numerous smaller consultancy providers, typically focused on a specific technology or specific field of expertise.

Education and training providers. The role of the education and training sector in digitalization and digital transformation lies in developing graduates whose skill profile matches the needs of organizations undertaking (or planning to undertake) the digital transformation. In simple words, education and training providers should provide those firm-level digitalization and digital transformation drivers that are related to education and training, such as digital skills leading to capabilities to gauge, plan, implement and optimize company's digital transformation (Vodafone, 2020). The crucial role of education in successful digital transformation is recognized and highly emphasized by policy makers at both national as well as international levels, as they recognize that the digital economy requires not only mastery of ICT skills, but also an entire set of complementary skills ranging from good literacy and numeracy skills through to the right socio-emotional skills to work collaboratively and flexibly (OECD, 2016).

Firms. Important stakeholders of digitalization and digital transformation at the business sector level are the firms in the sector themselves. Firms in the industry (either established ones or newcomers) are often initiators of digital shifts, changing or even disrupting the competitive landscape of an industry (Osmundsen et al., 2018). Due to digital technologies, competition in the markets becomes more global, and technologically advanced players gain bigger domination (Verhoef et al. 2021). Then, the companies in the respective industry often experience digitalization pressure through competitors' demonstration of digital advances, new entrants to the sector who bring disruptive digital business models, and technological progress in general, which, in turn, drives their efforts to engage in their own digital transformation (Haffke et al., 2016).

Suppliers. In addition to the firms themselves, the next important stakeholders in their digitalization and digital transformation at the industry/business sector level are the suppliers. Their position is particularly relevant in the case of entire supply chain

digitalization. In this case, besides intra-organizational digitalization, we also see the digitalization of inter-organizational processes (Holmström et al., 2019). Under the Industry 4.0 phenomenon, fully connected ecosystems are being created, and this also includes the supply chain management (Seyedghorban et al., 2020). According to Aliche et al. (2016) the “supply chains 4.0” is supposed to be faster, more flexible, more granular, more accurate and more efficient. Simply said, it is about “placing sensors in everything, creating networks everywhere, automating anything and analysing everything.” which shall lead to increased customer satisfaction and improved overall supply chain performance (Aliche et al., 2016).

Customers. Finally, important stakeholders of digitalization and digital transformation of companies are their customers (both at business and consumer levels). Their changing behaviour and expectations related to the digital revolution belong to the triggers of digital transformation (Osmundsen et al., 2018). These changes include growing demand for the personalization of mass-produced products (IDN, 2019), shifting purchase processes to the online environment especially through mobile devices, increased interactions with companies through digital touchpoints, increased use of search and social media tools, sharing online product reviews (Verhoef et al. 2021). Such consumer behaviour changes often are structural, and thus the use of new digital technologies can become new normal, disrupting the traditional ways and rules of conducting a business (Verhoef et al., 2017). Companies that will fail to follow these changes might lose their attractiveness and get replaced by competitors or new entrants who will manage to do so (Verhoef et al. 2021).

3.1 Stakeholders of Digitalization and Digital Transformation in Slovakia

The following part of our results section presents the results of our mapping undertaken in Slovakia. We present the specific examples of digitalization and digital transformation stakeholders using our classification described above. However, due to the industry-specific nature of the business sector-level stakeholders (i.e. according to our conceptualization, these are firms themselves, their suppliers and customers), these are not included in our national-level mapping of stakeholders.

Policy makers & regulators. In the face of a digital revolution, also national and regional governments are increasingly defining digitalization as a strategic priority and are setting up large-scale initiatives to foster digital transformation of industry, science and society. In Slovakia, this task belongs to the Ministry of Investments, Regional Development and Informatization of the Slovak Republic. This ministry has the responsibility for preparing and monitoring of fulfilment of strategic objectives derived from two basic documents of digital transformation in Slovakia, 2030 Digital Transformation Strategy for Slovakia and Action plan for the digital transformation of Slovakia for the years 2019 – 2022. The Council of the Government of the Slovak Republic for Digitalization of Public Administration and the Digital Single Market was established as an advisory, coordinating and initiative body of the Government of the Slovak Republic for issues related to informatization, digital single market and digitalization of public administration focused on providing electronic public administration services for legal entities and individuals and electronic eGovernment systems, as well as the development of the economic environment in Slovakia towards the digital economy.

The Ministry of Economy of the Slovak Republic is another policy maker and regulator in the field of digitalization, especially for the digitalization of industry. The Smart Industry Initiative aims to address the low levels of digital awareness amongst Slovak companies and to bring the nation's business community – particularly industrial companies – closer to the principles of Industry 4.0. The focus is on collaborative R&D cooperation with industry, and eventually the deployment of more advanced technologies throughout the economy (The Ministry of Economy of the Slovak Republic, 2016).

Technology suppliers. Since Slovakia has become a member of the EU, several global technology suppliers have adapted to the domestic market, such as IBM, SAP, Oracle, Accenture, Atos, or Asseco Solutions and Asseco Central Europe as part of the Asseco Group. In addition, several domestic major players in the field of digitalization have emerged in Slovakia, such as ESET in the field of cybersecurity, Soitron with a focus on automatization, robotization, cybersecurity and data management solutions, or Aliter Technologies with ICT products and solutions used by international organizations as well as global technology companies and suppliers in the field of security and defence. As stated in the Strategy of Digital Transformation in Slovakia until 2030, in a small economy such as Slovakia, it is necessary to accept the fact that new technologies are mostly brought by big global technological players and Slovakia has an opportunity to focus on the creation of innovative services.

Digital infrastructure providers. The level of digital infrastructure in Slovakia is evaluated as generally satisfying. Especially, we see a fast growth of the coverage by mobile broadband internet. There are three major mobile operators (Orange, Slovak Telekom, and O2) and all of them have the 4G/LTE mobile coverage of the population at above 94%. Other major internet providers are, for example, SWAN, Antik or Slovanet. Also, telecommunications companies emphasize that Slovakia is one of the countries implementing advanced technologies in practice often earlier than other EU countries, which is demonstrated by the latest innovative services of Slovak telecommunications operators. Further, an advantage for entrepreneurs in Slovakia is the presence of web hosting providers who operate internationally and have a lot of experience in the field of digitalization, for instance, Wedos, Websupport or Webhouse.

Education & training providers. Due to the need for reforming the education system towards meeting the needs of the digital economy, the Ministry of Education, Science, Research and Sport of the Slovak Republic is a key stakeholder in the country. It is the central body of the state administration for elementary, secondary and higher education, educational facilities, lifelong learning, and science. According to the Action plan for the digital transformation, the Ministry of Education is responsible for the preparation and implementation of the strategic document - Programme for Informatization of Education Until 2030. Another important player in this area is the Digital Coalition, which was set up in 2017 upon the initiative of the IT Association of Slovakia. It is a successful example of activism across a broad range of public, private, academic and civic organisations and institutions in Slovakia in order to improve the digital skills of citizens. As part of its work in the Digital Coalition, the Ministry of Education has started working on the inputs to the Digital Transformation Strategy in the field of education. Together with the Ministry of Labour, Social Affairs and Family of the Slovak Republic, other activities are supported, such as: Dual education or the national project "Sector-driven Innovations towards an Efficient Labour Market in the

Slovak Republic.” following the concept "Work 4.0" with a focus on readiness for a career change in the digital future.

As for the education providers in Slovakia, up to twelve universities offer the study of Computer Science and IT programs. There are also several companies providing high-quality further education (life-long learning) in IT, such as GOPAS, ELCT, IT LEARNING SLOVAKIA, IT Academy and a successful programme Cisco Networking Academy at secondary schools and universities that prepares specialists in computer networks and IoT.

Aware of the need to support gender balance in the IT world, there are initiatives in Slovakia aimed at building women's IT skills. Examples are the Mini Tech MBA, a unique training program created specifically for women that offers a comprehensive overview of information technology, improving digital skills and expanding the network of contacts, or the "AJ ty v IT", a civic association that helps women discover the magic of technology. They educate, motivate, and start their careers in IT.

Expertise & consultancy service providers. Almost all global consulting companies in the field of business digitalization and digital transformation also operate in Slovakia. The top consulting firms in Slovakia for digital expertise and consultancy services are, for example, Accenture, Deloitte, KPMG, Atos, PwC, EY, or IBM Services. The most important domestic expertise and consultancy service are, for example, Centire, EMARK or Stengl.

Financing providers. The key sources for the development of digitalization in Slovakia in the coming years will be the EU structural funds and resources from the approved recovery plan of Slovakia after the COVID-19 crisis. The EU's plan for economic recovery demands that member states allocate at least 20% of the €672.5 billion Recovery and Resilience Facility to digital transition. Investment programs such as the research and innovation-centered Horizon Europe and infrastructure-centered Connecting Europe Facility allocate substantial amounts for digital advancements as well. In Slovakia, up to €1.2 billion will be spent on digitalization and informatization from the European funding package as part of the recovery plan.

Another relevant source of financing for the digital transformation of companies in Slovakia are bank loans of commercial banks. According to the SAFE survey, this source of financing is often used and easily accessible among SMEs in Slovakia (European Commission, 2020).

Support providers. While there are many providers of support for entrepreneurs in Slovakia (for example Slovak Business Agency, Slovak Innovation and Energy Agency), the area of digitalization is still insufficiently represented. The OECD report SME and Entrepreneurship Policy in the Slovak Republic draws similar conclusions (OECD, 2021b).

Slovak Business Agency (SBA) is crucial and is the oldest specialized non-profit organization for the support of small and medium-sized enterprises in Slovakia. SBA has established a network of National Business Centres. These centers are designed to act as a one-stop-shop, providing various services to SMEs, differentiated by the life cycle of their intended beneficiaries. One part of the services is focused on supporting SMEs in the digitalization process, particularly by the workshops, seminars, consulting, and the possibility of using Creative Points.

Slovak Innovation and Energy Agency (SIEA) is a contributory organization established by the Ministry of Economy of the Slovak Republic. The main role of the

SIEA is to raise awareness about energy efficiency, renewable energy sources, and innovations in all fields of economy and provide expert consulting in those areas. In the field of innovation, SIEA focuses on the preparation and implementation of supporting schemes for businesses to support their competitiveness; analysis of innovation potential in Slovak industries, and participation in creating policies in the field of innovations and focuses on raising awareness regarding the significance of innovations on all levels.

Besides the two government agencies, there are many other supporting organizations and associations that provide various support services (training, consulting) also in the field of business digitalization, for example, The Slovak Alliance for Innovation Economy, Impact Hub, Slovak Chamber of Commerce and Industry (SCCI), etc.

Business sector and cross-sectoral organizations. In Slovakia, there are various non-profit organizations, unions, and associations representing entrepreneurs and the business sector. The most important business associations are, for example, the Entrepreneurs Association of Slovakia, the Young Entrepreneurs Association of Slovakia, the Slovak Craft Industry Federation, the National Union of Employers (NUE), Klub 500, Business Alliance of Slovakia (BAS), and others. Clusters also play an important role in digital transformation in Slovakia, as they represent platforms for collective action to help companies from different sectors to innovate better and exploit their business opportunities. A good example is Košice IT Valley, representing a regional partnership of IT companies, education institutions, and regional authorities. Other clusters and organizations in Slovakia that support digitalization include e.g. the Industry Innovation Cluster, the Cyber Security Cluster, or the Union of Slovak Clusters.

In order to improve the preparations of companies for the digital transformation, the Industry4UM platform was created as an initiative of industry representatives under the auspices of the Ministry of Economy of the Slovak Republic. Its whose ambitions are: to be an independent, expert, opinion-making authority in the field of company transformations; to bring industries together for common goals in the field of Industry 4.0; to provide companies with more information and increased expertise on Industry 4.0, digital transformation and innovations enhancement; to educate and raise awareness of the public on the subject of Industry 4.0; and to bring together experts and create a platform for the exchange and sharing of expert views and many others.

4 Discussion and conclusion

Our findings yield several implications for both further research as well as for business practice. Regarding the first, we found the body of knowledge on the researched topic very dynamic and fast-growing (especially in the recent few years) yet still under-developed. Some of the stakeholders and their roles are not sufficiently covered in the literature, so we encourage future research to address these issues. As for the latter, our findings can serve particularly different stakeholders who plan or implement initiatives and actions towards digital transformation. Namely, they might find useful the link of other stakeholders with whom they could network or even synergize their efforts. Also, businesses themselves might find useful having an access to a single list of digitalization stakeholders, whom they might need to approach to foster their digitalization projects.

Also, our work is not an excerpt from limitations. For example, as the literature review was not limited to academic literature, we were not able to adopt a systematic literature review design. We are aware of drawbacks of such approach, but we also understand its benefits, and in our opinion, the latter prevail. Yet, as stated above,

systematic literature review with this focus is highly recommended. Then, also the stakeholder mapping part could be replicated to further improve its robustness, e.g. by engaging expert respondents and practitioners from the field in qualitative inquiring.

To conclude, the aim of our paper was to review the concepts related to digitalization and digital transformation stakeholders, adapt the stakeholder classification to the context of Slovakia, and identify the examples of stakeholders in our national setting. In fulfilling this aim, we have reviewed the academic literature, policy documents and professional and practitioner documents that deal with the issues of environmental context and its actors (i.e. stakeholders) relevant for digitalization and digital transformation of a business organization. Based on that, we have proposed a conceptualization of digitalization and/or digital transformation stakeholders at the national level, while also recognizing the business sector-level stakeholders. Building on our conceptualization, we conducted a thorough examination of a complex multi-stakeholder system related to entrepreneurship and digitalization and/or digital transformation in Slovakia, in order to map the main stakeholders. With these two dimensions of our results, we contribute to the emerging body of knowledge in this field in Slovakia, both in academic as well as in practitioner context.

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