



Building digital innovation ecosystem for SMEs

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ABBREVIATIONS

BBB	Big Blue Button
BiH	Bosnia and Herzegovina
BD	Brcko District
CERT	Computer Emergency Response Team
CoE	Center of Excellence
DdoS	Distributed Denial of Service
eSEE	Electronic Southeast Europe
EBRD	European Bank for Reconstruction and Development
FBiH	Federation of Bosnia and Herzegovina
Fintech	Financial technology
FMRPO	Federal Ministry of Development, Entrepreneurship and Crafts
GII	The Global Innovation Index
AI	Artificial Intelligence
BPO	Business process outsourcing
CAD	Computer-aided design
CAM	Computer-aided manufacturing
CRP	Customer relationship management
ERP	Enterprise resource planning
GIZ	Deutsche Gesellschaft für Internationale Zusammenarbeit GmbH
ICT	Information and Communications Technology
ILO	International Labour Organization
IoT	Internet of Things
MEASURE II	Monitoring and Evaluation Support Activity II
MEE	Ministry of Economy and Entrepreneurship of RS
MoFTER	Ministry for Foreign Trade and Economic Relations in BiH
MSME	Micro, Small and Medium-Sized Enterprises
NCTS	New Computerized Transit System
NGO	Non-Governmental Organization
OECD	Organisation for Economic Co-operation and Development
PSD2	Payment Services Directive
PUFBiH	Tax Administration FBiH
R&D	Research and Development
RS	Republic of Srpska
RARS	Republic Agency for the Development of Small and Medium-Sized Enterprises
SEBS	School of Economics and Business, University of Sarajevo
SME	Small and Medium-Sized Enterprises
SBA	Small Business Act
SEBS	School of Economics and Business Sarajevo
USAID	United States Agency for International Development
WB	World Bank

CENTER OF EXCELLENCE FOR EVALUATION AND POLICY RESEARCH

The Center of Excellence (CoE) for Evaluation and Policy Research was established in March 2021 as part of the United States Agency for International Development (USAID) funded Monitoring and Evaluation Support Activity II (MEASURE II) Partnering for Excellence in Evaluation and Research grant awarded to School of Economics and Business Sarajevo (SEBS). The CoE strives to serve as a centralized training facility and thought leader and to support the sustainability of efforts to build research and evaluation capacity, and to provide monitoring and evaluation services in Bosnia and Herzegovina (BiH). Working closely with experts in social science research and program evaluation from across BiH, the CoE will:

1. Conduct surveys in relevant social and economic policy fields
2. Conduct data analyses and develop survey reports
3. Develop conceptual, methodological, and policy models and present them to relevant ministries, employment bureaus, chambers of commerce, and industry leaders
4. Design and produce policy papers to identify key social and economic issues
5. Assist BiH government institutions in designing and conducting rigorous evaluations of programs and initiatives

Through these activities, the CoE will build close cooperation with key stakeholders, private and public sectors, and academia and promote collaboration and evidence-based decision making at all government levels in BiH.

DISCLAIMER

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EXECUTIVE SUMMARY

PURPOSE

The aim of this report is to provide an overview and a systematic analysis of the digital innovation ecosystem, as a network of innovative actors who connect online and interact digitally in ways that create value for all, for small and medium enterprises (SMEs) in BiH.

METHODOLOGY

This research relies on a mixed-method approach, split into two phases. Firstly, an extensive desk review was performed, surveying the primarily strategic documents related to improving the digital innovation ecosystem for SMEs in BiH. Secondly, semi-structured interviews with local and international key stakeholders in the digitalization reform processes were conducted.

KEY ASSESSMENT FINDINGS

The country's poor performance is evident especially in terms of competitiveness of human capital and qualified information and communications technology (ICT) specialists. Moreover, this low performance - in terms of supply of and demand for digital skills - has resulted in little innovation within the country. Most SMEs do not use digital technologies, such as the Internet of Things (IoT), big data analytics, or artificial intelligence (AI) for business purposes. Those who use it are usually SMEs with greater revenue, operating in specific sectors. Nevertheless, due to the COVID-19 pandemic, SMEs improved some of their practices in terms of adapting to online sales channels. Still, one of the biggest barriers to e-commerce, on the demand side, is the customer's fear of the security of using payment cards and fraud from unreliable merchants. Furthermore, another barrier to e-commerce is the fact that shipping products is too expensive, due to the high cost of online payment transactions and transportation of goods in BiH. Finally, in terms of digital resilience, SMEs have little awareness of the importance of cybersecurity for their business and lack knowledge about the ways in which they can protect and make their businesses more resilient. Digital resilience, especially from the perspective of cybersecurity and protection is perceived as being costly and not a worthwhile investment in the business. Accordingly, due to lack of resources, awareness and knowledge, SMEs are targeted more often by cyber-attacks, compared to larger companies, and compared to other countries in the region.

PRELIMINARY RECOMMENDATIONS

Faster and better reaction by regulators at all state and entity levels is needed, to stimulate rather than slow down technological progress. Specifically, an institutional framework for SMEs digital transformation at the state level is needed. A key recommendation is to increase the awareness of, and capability-levels of BiH's SMEs by establishing an online platform as a single source of information for SMEs willing to digitalize, which would act as a tool to help match the demand to the supply of digital solutions. Another extremely important recommendation is that both demand and the supply sides of the market have access to financial resources. New ways of financing digitalization within SMEs should be developed. Moreover, the response of SMEs to cybersecurity is often reactive to existing problems. To improve this, SMEs should cooperate with professional companies specialized in cyber security, to raise awareness on this issue and to address the cybersecurity-related issues in general. Moreover, in the e-commerce sector, it is necessary to start with the fundamentals and implement new legal and technical/market infrastructure for the payment costs and postal services to be lowered.

INTRODUCTION

Digital technologies significantly affect the way of life and work of a growing part of the population. Products, services and process innovation are an imperative for the modern entrepreneurship. Transforming ideas into new products and implementing digital solutions encourages the transformation of the traditional economy into a high-tech, research-development and digital one, which enables the successful export of goods, services and digital solutions and competitiveness on the domestic and foreign markets. Nevertheless, there is a lack of analysis in BiH that would focus on the state of digitalization of business.

The phrase *digital innovation ecosystem* refers to a network of heterogeneous social and technical elements, which co-evolve over time. Specifically, it is a complex arrangement of technologies, methodologies, concepts, business application areas, organizations, and institutional contexts (Chae, 2019). The concept of a national digital innovation system is generally accepted in digital innovation ecosystem analysis, as it encompasses all the institutions and organizations (as well as their relationships, knowledge, and financial flows) in one economy, which create, transfer, and apply new knowledge to achieve economic growth and/or a higher standard of living (Busse et al., 2015).

SMEs are very important for a country's inclusive economic development. Nevertheless, they are neglected due to a lack institutional and market regulations, and especially due to limited access to external finance. Moreover, SMEs play a key role in providing livelihoods and income to different segments of the workforce, in creating new jobs, fostering added value and economic growth (Sommer and Disse, 2020). According to Abolhassan (2017), independent companies, all around the world, including BiH, will no longer be able to withstand the pressure of competition on the market (especially SMEs), which will lead to the formation of digital innovation ecosystems and service networks in which companies will connect and develop collaborative business models. In this way, the companies will jointly offer a better service compared to their competitors, which will significantly increase their market value.

Hence, the digital innovation ecosystem for SMEs will be analyzed through its clearly defined structural elements. These include the three digital innovation ecosystem building blocks: 1. The policy, legal and institutional framework; 2. Infrastructure and skills; and 3. Network of actors. This review will present preliminary recommendations for improving the digital innovation ecosystem, which should enable institutions to improve their innovation-oriented policies and innovators to do business more easily, hire more people and export their innovative products and services to other countries.

Research objectives

The aim of this report is to provide an overview and systematic analysis of the digital innovation ecosystem for SMEs in BiH. It also addresses the biggest opportunities and challenges of the ecosystem, suggesting relevant and context-specific initiatives for SMEs' digital innovation ecosystem. Moreover, the digital innovation ecosystem is analyzed within the context of creating a business friendly environment and employing digitalization as a tool for improving business sector competitiveness in BiH.

The future products, following this assessment, will build on the findings of the USAID/BiH's Digital Ecosystem Country Assessment (DECA). Namely, USAID published its first Digital Strategy for 2020-2024. The first initiative in the implementation process is DECA, a tool for identifying development opportunities and risks in a country's digital ecosystem. DECA is based on three pillars: digital infrastructure and adoption; digital society, rights, and governance (including digital media, digital civil society, and e-

governance); and the digital economy. The research will provide information on digital programs and investments for decision makers both at USAID and in partner governments, donors, the private sector, and civil society. Also, COE's future products (a policy model and a policy paper) within the area of digital innovation ecosystems for SMEs in BiH will build on the findings of this study.

Overview of the report

The Digital assessment report is organized in three key sections: methodological framework; the digital innovation ecosystem for SMEs in BiH and finally, recommendations.

The first section contains a detailed description of the methodological framework for primary and secondary research.

The second section provides a context analysis of the digital innovation ecosystem for SMEs in BiH and a summary of main findings. In this part, a brief field overview and systematic analysis, based on the desk review and interviews, of the digital innovation ecosystem for SMEs in BiH is given through four main subsections: Digital transformation of SMEs; Building digital and business resilience of SMEs; Future of work – digital transformation of workplace (in the SME sector); E-commerce (in the SME sector). In particular, these findings are built on four research questions:

- Question 1: What are the current trends in the digital transformation of the SME sector in BiH?
- Question 2: How can the digital and business resilience of SMEs be supported? Which factors could foster the building of digital and business resilience in SMEs?
- Question 3: What is the current state of digital transformation of the workplace in SME sector? In what measure can digital competences and innovativeness of employees contribute to a more successful digital transformation of a working environment in organizations?
- Question 4: What are the biggest challenges for e-commerce development in SME sector?

Moreover, cybersecurity, as a cross-cutting issue, is addressed across all research questions.

Finally, in the last section of the report, the preliminary recommendations section, the main recommendations and concluding remarks arising from key findings on both primary and secondary data analysis are presented.

METHODOLOGICAL FRAMEWORK

This section provides a detailed description of the methodological approach used to assess the digital innovation ecosystem in BiH.

This research relies on a mixed-method approach:

- an extensive desk review of primarily legal and strategic documents (e.g., laws, by-laws, decisions, strategies, action plans, frameworks, reports, etc.) related to the improvement of the digital innovation ecosystem for SMEs in BiH,
- semi-structured interviews with important local and international stakeholders in the digitalization reform processes.

Firstly, the systematic analysis of relevant legal and strategic documents of relevant public institutions at different levels was conducted. The process of collecting the required documentation was carried out in two main steps. Firstly, publicly available documents on the internet were reviewed, and secondly, documents that were not available online were acquired by directly contacting the respective public institutions. In addition, the systematic analysis also presents the key actors, institutions, and indicators/data that can serve as proxy indicators of economies' digital innovation ecosystem capacity and development. Therefore, the innovation system was analyzed from a dynamic perspective, taking into consideration its evolutionary character and challenges to sustainability. Given the lack of policy evaluation and relevant statistical data in the country, systematic and qualitative document analysis represents the most appropriate approach for digital innovation ecosystem analysis. This was conducted by using gap analysis and critical review, rather than a descriptive analysis of the existing policy framework and innovation ecosystem.

Secondly, semi-structured interviews with the most important local and international stakeholders in the digitalization reform processes were organized between June 2022 and July 2022. The interviews were conducted with experts and stakeholders on the ground via an online Big Blue Button (BBB) platform, and a recording of the interview was created.

A request to participate in the research was sent to 23 previously identified institutions/organizations that given their scope of work and current activities, the research team had identified as being relevant to informing the assessment findings, 11 of which agreed to an interview (Annex A). The sample was not expanded because a saturation point was reached with this number of interviews. The sample structure of key stakeholders consisted of 3 public sector institutions (FBiH and RS), 4 international organizations, 2 associations, and 2 innovation hubs. Interview invitations were sent out via an e-mail (Annex B). Moreover, depending on the availability and preference of the interviewees, interviews were held in person or online. All interviews were transcribed, and a content analysis of the data was carried out. The responses validated those hypothesised key challenges previously identified through systematic analysis, and significantly contributed to the definition of further pathways towards a sustainable digital innovation ecosystem for SMEs in BiH.

The methodological approach applied by the research team ensured systematic and efficient data collection and triangulation of information across different sources and methods, and it enabled the relevant overview and the assessment of the area and key area(s) of possible policy interventions.

Limitations

The research team encountered a number of limitations when conducting the research.

1. Limitation #1: Lack of available information at official government websites at various levels. The documents were either completely missing, or it was very difficult to locate them due to different jurisdictions, which made the search for the right information challenging.
2. Limitation #2: Arrangement of the interviews. Namely, as the interviews were held during the summer, it was challenging to get in touch with all the planned interviewees as many were on holiday.
3. Limitation #3: Some government representatives did not show any interest in participating in the interviews.

Nevertheless, these limitations were addressed in several ways. Namely, in terms of the first limitation, as the websites on all levels do contain recent strategic documents, they ensured enough data for the process is appropriately completed. As for the second limitation, reminders were sent, and key informants were contacted (over the phone and/or email) few times and offered with different meeting timeslots. Finally, in cases where the contacted informant refused to participate in the interview, the team asked the contacted informant to suggest or connect the team with another person from the same institutions who can provide valuable information for the assessment. Also, while reaching out to key informants, the team explained the importance of the research and the relevance of informants' participation in informing the assessment with the aim to strengthen informants' interest and readiness for participating in the data collection process. In the end, enough local and international stakeholders in the digitalization reform processes were interviewed and very insightful data was collected.

THE DIGITAL INNOVATION ECOSYSTEM FOR SMEs IN BOSNIA AND HERZEGOVINA

The systematic analysis of the digital innovation ecosystem for SMEs in BiH resulted in several main findings regarding the digital transformation of SMEs, business resilience, digital workplace transformation, e-commerce development and cybersecurity. In this section, the findings of the interviews and the desk review are presented. The socio-economic and reform context analyses were based mostly on current strategic documents at the national, entities and Brcko District (BD) level, and the analysis was additionally supplemented by the results of the interviews.

Sectoral analysis

- SMEs are the major contributors to job creation and inclusive economic growth in BiH.
- The SMEs sector is in jurisdiction of many levels (national, entity, cantons, and municipalities) in BiH.
- SMEs policies are underdeveloped at the national level and mainly exist at the FBiH, RS and BD levels. There is the low level of investment in R&D in of the SME sector.
- Companies are mostly using the Internet for communication and advertising and less for e-commerce.

Legal and institutional framework

BiH is not only characterized by the complex organization of the state, but also by vaguely defined authorities for certain areas, so that there are certain laws which define the same legal matter and are passed both at the state level and at the lower levels. This applies to the SME sector, which falls within the jurisdiction of many levels (national, entity, cantons, and municipalities) in BiH. SMEs policies are underdeveloped at the national level however, and mainly exist at the FBiH, RS and BD levels.

Moreover, there is no law on the development of SMEs at the national level and no single definition of SMEs in BiH. The laws dealing with the development of SMEs are adopted at lower levels of government (entities and BD) in BiH. Specifically, in the FBiH, the current Law on Encouraging the Development of Small Business was adopted in 2006. The current law provides a definition of micro, small, and medium enterprises (MSMEs), small business development measures and actions that development funds can be used to. However, a new Law on Encouraging the Development of Small Economy is in the process of adoption.

In 2013, the Law on Development of Small and Medium Enterprises in RS was adopted. The law defined principles of MSME development, the classification criteria on MSME, and it defined entrepreneurial infrastructure. In the BD, the Law on Encouraging Economic Development was adopted in 2006. The law regulates the status, among other, of foreign companies and entrepreneurs on the territory of BD.

Table 1. Agencies responsible for digital transformation and SMEs in BiH and entities			
Responsibilities	Responsible Agency		
	BiH	FBiH	RS
<i>Digitalization</i>	Ministry of Transport and Communications of BiH		
<i>ICT</i>	Ministry of Transport and Communications of BiH	Ministry of Communications and Transport of the FBiH	Ministry of Scientific and Technological Development, Higher Education, and Information Society of the RS
<i>Entrepreneurship</i>	Ministry for Foreign Trade and Economic Relations in BiH	Federal Ministry of Development, Entrepreneurship and Crafts	Ministry of Economy and Entrepreneurship of RS

Source: Author's work based on data collected through desk review.

As can be seen in Table 1., the responsibilities for digital transformation and SMEs are divided among several ministries across the levels of BiH and the entities. The Ministry of Transport and Communications of BiH is the corresponding ministry for the adoption of legal regulations in the field of digitalization and information security. However, even though the Ministry of Transport and Communications of BiH is responsible for enacting laws in the field of digitalization, it often happens that the application of the laws adopted is limited or not possible, due to fact that the provisions of the existing laws or regulations are contradictory to the provisions of the other digitalization-related laws.

BiH adopted the Information Society Development Policy of BiH for the period 2017-2021 ("Official Gazette of BiH", No. 42/17), and the Information Security Management Policy in the Institutions of BiH, for the period 2017-2022 ("Official Gazette of BiH", No. 38/17), and in that regard clearly defined its strategic commitment regarding the development of the information society and the improvement of information security on the territory of BiH.

Furthermore, some of the important documents and regulations and the digital transformation of SMEs in BiH are the: Electronic Southeast Europe Agenda (eSEE) (Directorate for Economic Planning, 2015); the Strategic Framework for BiH (Directorate for Economic Planning, 2015); the Law on Electronic Signature of BiH ("Official Gazette of BiH" No. 91/06); the Law on Electronic Legal and Business Traffic ("Official Gazette of BiH", No. 88/07); and the Law on Electronic Documents ("Official Gazette of BiH", No. 58/14).

When it comes to the level of the FBiH, the Ministry of Communications and Transport of the FBiH is responsible for drafting laws and other regulations in the field of information technology. By analyzing the regulations adopted by the government of FBiH in this area, the responsible ministry (at the level of FBiH) has so far prepared laws that already existed at the level of BiH.

The Ministry of Scientific and Technological Development, Higher Education, and Information Society of RS is, among other things, responsible for the development of the 'information society' and encouraging innovation and economic development using new technologies in RS. Compared to the state level and the FBiH, RS has made a certain step forward in terms of the adoption and implementation of the legal framework and has adopted the Strategy for the Development of the Electronic Government of the RS, as

well as a number of laws that define or facilitate electronic business, but also define information security as well as the protection of critical infrastructure on the territory of the RS. Some of these include the Law on Electronic Business of the RS ("Official Gazette of the RS" No. 59/09); the Law on Electronic Document, Electronic Identification and Trust Services in Electronic Business ("Official Gazette of RS", No. 94/2017); the Law on Critical Infrastructure ("Official Gazette of RS", No. 87/2018); the Law on Information Security ("Official Gazette of RS", No. 70/2011) and, the Law on Tax Procedure ("Official Gazette of RS", No. 78/2020).

Furthermore, the institutions responsible for the development of entrepreneurship in BiH are the Ministry for Foreign Trade and Economic Relations in BiH (MoFTER), the Federal Ministry of Development, Entrepreneurship and Crafts (FMRPO), and the Ministry of Economy and Entrepreneurship of RS (MEE). Moreover, at the lower, cantonal level in FBiH, the cantonal ministries for economy are responsible for the entrepreneurship sector.

In terms of the strategic framework for competitiveness and innovation, it can be said that the overarching policy framework is represented within the Small Business Act for Europe (SBA), which aims to improve the approach to entrepreneurship in Europe. This framework is widely accepted in BiH, and its implementation is carried out through a network of SBA coordinators nominated at the level of state, entities, and BD (EDA, 2020).

Furthermore, the process of developing a harmonized legal, strategic and policy Framework for development of SMEs in BiH (Framework) has begun in 2019. The Framework will be harmonized with the SBA and enable the harmonization of supporting strategies and policies for SME development in BiH (EDA, 2020). One of the KIs mentioned that "now, for the first time, we have harmonized action plans for supporting SMEs for 2021-2023, and we are trying to work on this new policy and to channel experiences from the field and requests through competent institutions and policy documents".

It is also a significant advantage that an inter-institutional team consisting of representatives of institutions at different administrative levels in BiH, as part of the SBA, has prepared a standardized methodology for management of SME development. The methodology should enable the harmonization of SME development strategies and policies with the European framework, as well as the practical completion of the SME development cycle, including digital transformation. According to a KI from a public institution, ministries at all levels are now much more interested in the digitalization of SMEs, and in accordance with this, the entity ministries for entrepreneurship have also started allocating incentives for digital transformation through their public calls.

The main strategic document for the development of SMEs in RS is the RS Strategy for the Development of SMEs (2016-2020). Whereas, at the FBiH level, in accordance with the provisions of the Law on Development Planning and Development Management in the FbiH, the entity Government adopted the Development Strategy of the FbiH 2021-2027. This Strategy is the basis for the harmonization and creation of development strategies of cantons and local self-government units, sectoral strategies, and other strategic and implementation documents, as well as basic platform of socio-economic development of the FbiH.

Moreover, the FMRPO prepared and adopted in 2008 a project document, Development of SMEs in the FBiH for the period 2009- 2018 (SME Project), which defined the strategic goals, priorities, and measures for the development of the entrepreneurial sector at the entity level (FMRPO, 2008). The SME Project is the most important strategic document of FMRPO for the development of SMEs and crafts, which defines

the directions of development of this area in FBiH. Based on long-term strategic goals and priorities, FMRPO has developed three Action Plans for the implementation of the SME Project for the periods 2009-2012, 2013-2015 and 2016-2018 (FMRPO, 2016).

Currently on the level of FBiH, the last strategic document for SME's development is the Action Plan for Development of SMEs for the period 2019-2020 (FMRPO, 2019). Preparatory activities for a new strategic document will be done by the FMRPO, according to the new planning period 2021 to 2027 and the Development Strategy of FBiH for 2021-2027. In particular, a KI from a public institution said that the "Legislation for the digital transformation of SMEs has not yet been adopted, but FMRPO is now in the process of creating a sector strategy, as the entity development strategy has been adopted, the process of creation of the SME strategy where the focus will certainly be on innovation, digital transformation and green economy has started. This will result in the projection of measures into action plans and into our grant schemes for the support of SMEs. In the final phase, the ministry now has two laws, one encouraging small businesses and the other on entrepreneurial infrastructure, which indirectly touches on digital transformation."

Business environment

The private sector in BiH is poorly developed. Its share of the country's gross domestic product (GDP) is only 65% and it is the lowest in the region (Council of Ministers BiH, 2019). SMEs represent most businesses globally, accounting for about 90% of business, whilst employing about 60% of the OECD's workers (Organisation for Economic Co-operation and Development). In BiH, SMEs represent around 99% of all enterprises (31,435 are currently active, with 90% employing less than 10 people) in the non-financial sector in 2015 (UNDP, 2020). Moreover, SMEs in BiH are major contributors to job creation and inclusive economic growth, by participating with over 60% in the overall employment and creating over 60% of the GDP (EU Info Center, 2017).

Nevertheless, one of the challenges facing the entrepreneurship sector in BiH is the low level of investment in research and development (R&D), which has a significant impact on the competitiveness of BiH's R&D community globally. The R&D expenditure per inhabitant in BiH was EUR 10 in 2018, while in the EU-27 the average was EUR 662 (Eurostat, 2020). Moreover, the gross expenditure on R&D - as a percent of the GDP in 2020 - remains the same as in 2017 when it was 0.2% (UNESCO Institute for Statistics, 2020). In 2020, the intended budget for R&D by the business sector in BiH was 10.6% (Agency for Statistics of BiH, 2021). In particular, the number of patent applications submitted to the Institute for Intellectual Property of BiH in 2021 was 61 (54 resident and 7 non-resident applications), which is an increase of 10.9% compared to 2020 (Agency for Statistics of BiH, 2020).

The Global Innovation Index (GII) (Cornell University, 2022), which provides detailed metrics about innovation performance of 132 countries (and explores a broad vision of innovation, including business sophistication) ranks BiH as 70th (the 2021 rank was 75), out of 132 countries, in terms of innovation performance. Among the analyzed categories for BiH, market sophistication has the highest rank of 25, while business sophistication has the lowest rank of 98.

Furthermore, the overall productivity of SMEs appears to be lower than the EU average. Most of the difference in productivity remains unexplained and the lower level of digitalization of SMEs may play a critical role in this. The average SMEs productivity, measured as value added per person employed, is EUR 13,950 in BiH, which is less than a third of the EU average of EUR 42,700. The lower productivity of BiH's

SMEs may be partly explained by the sectoral mix. The dominant type of employment that SMEs contribute is within the wholesale and retail sector, which contributed the most to SMEs value added in the 'non-financial business economy' of BiH. In particular, the wholesale and retail trade sector generate almost 31% of total employment in SMEs and 33% of value added by SMEs. The manufacturing sector generates about 29% of employment and 26% of value added among all SMEs, making it the country's second most important SME sector. However, most of the difference in productivity remains unexplained and the lower level of digitalization of BiH SMEs may play a crucial role (SBA Factsheet BiH, 2019).

In terms of the internet usage, Western Balkan companies are still using the Internet in a traditional fashion, mostly for communication and advertising and less for e-commerce¹. The Balkan barometer report from 2022 underlines that despite widespread internet usage, not much of companies' sales in the region is generated online: 38% of respondents² said that less than 5% of sales were generated online, which is a striking decline compared to a year ago, likely driven by the easing of the COVID-19 restrictive measures. The usage of e-banking continued to grow over the past year. Innovative dynamism has not seen much of a change as businesses continue to rely on their own strengths in terms of both capacity and financing (RCC, 2022).

Moreover, in accordance with Kemp (2021), BiH had over 2.3 million internet users in 2021 and the internet penetration stood at 95.99% (RAK, 2021). The most common goods ordered online in 2020, were clothing, footwear or accessories followed by household goods, furniture and utensils (Agency for Statistics of BiH, 2022). Furthermore, in 2021, there were 1.8 million social media users in BiH, which is equivalent to 55.0% of the total population in 2021 (Kemp, 2021).

Specifically, regarding the SME sector, according to the Agency for statistics in BiH, 76.5% of medium-sized enterprises and 57.8% of small enterprises have a website, while 16.4% of medium-sized enterprises and 6.1% of small enterprises are using cloud computing services. Moreover, the survey showed that 17.2% of enterprises in BiH use interconnected devices or systems (IoT) that can be monitored or remotely controlled via the Internet (Agency for Statistics BiH, 2021).

Digital transformation of SMEs

- Most SMEs in BiH, except for those larger ones with greater revenues, do not use digital technologies in their daily operational routines.
- Projects funded by the international community follow the wider global trends. These projects are very active and important for the digital transformation of SMEs in BiH.
- SMEs and especially their top management, are not aware of the importance of digital transformation for their business performance.

Overall, companies in BiH work in accordance with what their business partners are looking for. These end user's requirements, usually prompt SMEs to invest in the robotization of production processes and ERP

¹ In terms of the EU, e-commerce makes 10 to 15% of total retail sales. Yet it influences a much greater share (up to 50%) of the consumer journey, which nowadays includes a mixture of physical and online. Almost every second buyer in retail uses online channels for some part of the purchase in EU (Lone et al., 2021).

² Business Opinion Survey was conducted among business owners, managers and senior executives, with a total of 1,203 respondents for the entire Western Balkans region (Albania, Bosnia and Herzegovina, Kosovo*, Montenegro, North Macedonia, and Serbia).

solutions, and that is the level of digital transformation that most companies are currently at. Furthermore, most SME investments in new machines for technological production are financially supported by governmental institutions or international organizations.

Moreover, in terms of the investment in digitalization, a KI from a public institution mentioned that the institution had, in the last two years, public calls targeting digital transformation. But even despite the investment in IoT, big data analytics, and use of AI in companies was acceptable, the applications received were primarily referring to smart machines and smart solutions, ERP, CRM, Cloud, computer-aided design (CAD) and Computer-aided manufacturing (CAM) licenses, web shops and e-commerce solutions. Specifically, in order to advance the level of digitalization, one of the KIs emphasized that it is necessary to connect the BiH SMEs with global value chains, which requires greater competitiveness and more advanced digital solutions. Nevertheless, the challenge is that most digital solutions happen on an ad hoc basis and based previously seen solutions from other companies from BiH and abroad.

Some sectors in BiH have shown greater progress in digital transformation compared to others. Most KIs underlined that the wood, metal and plastics sectors are the ones whose nature, as processing and export orientated industries, are most prone to digital advancements. On the other hand, the agriculture, textile and production sectors' progress in digital transformation in BiH is modest. Although the agriculture and textile sectors did not fully digitally transform, international organizations are engaged in supporting their digitalization and some positive examples of how these sectors may benefit from digitalization do exist in the neighboring countries (i.e., Croatia, Serbia, Montenegro, etc.). A KI emphasized that, even though digital transformation would be of the utmost importance for the production sector, due to financial issues and the overall existential crisis of many companies, digitalization is not seen as a priority.

Moreover, in terms of outsourcing businesses and own product development, in the last years BiH has made significant progress in opening outsourcing businesses especially in the ICT but also in the Business process outsourcing (BPO) sector. Most of the domestic IT companies work for more developed countries and they do not want to work on the local market because of smaller profit margins and the complexity of cooperating with local partners that in most cases do not understand processes to develop a new product from scratch (ABSL, 2021).

In general, when it comes to the legal and policy support to digitalization, the KIs underlined that the existing policy and legal framework are no obstacle for the digital transformation of SMEs in our country. Nevertheless, the companies themselves must recognize the importance and need for digitalization and eventually use the support provided by the international organizations.

Digital transformation in the public sector

Digital transformation is one of the key elements in the progress and modernization of companies and the economy, as there are benefits for both the economy and society. Nevertheless, in order to achieve this, SMEs need a business enabling environment which includes the digital transformation in the public sector (Rupeika-Apoga, et al., 2022). There are two main aspects through which the digitalization of the public sector may directly facilitate the digital transformation of companies. On the one side, the government can develop policies and incentives which promote digital transformation of the companies, which in turn allows firms to digitalize, innovate and gain competitive advantage. On the other side public sector institutions can digitalize their internal processes and public service offers in order to act as an supporting mechanism to the private sector. (Radas and Bozic, 2009)

In terms of the digital transformation in the public sector, one of the KIs stated that "everything related to communication with the state, obtaining documents, submitting reports and everything similar should be digitized. The procedures are too long and time consuming for the simplest things, everything is slowed down by the administration and the instructions are unclear". Accordingly, everything would be easier, quicker and cheaper, if online documentation access, online payment and communication would be available.

As a poor example of digitalization in the public sector, some of the KI's alluded to the one stop shop solution for business in FBiH. Compared to the RS, the processes of starting and registering business in FBiH are still expensive, prone to corruption, slow and poorly managed by lack of collaboration between different institutions and stakeholders in FBiH. Moreover, the implementation of planned reforms in public administration is very slow. One of the KIs mentioned the lack of electronic signature as the best argument for this statement.

When it comes to public sector employees, the KIs underlined that there are a lack of qualified employees and knowledge in the country regarding digital transformation and that there is an evident fear of change. The public sector employees have a risk-averse mind-set towards digitalization and innovation, due to the lack of knowledge and fear of losing their jobs once the tasks they are currently performing are digitalized and automated. To improve the digitalization dynamics, employees should be empowered to take initiatives, and knowledge should be spread and shared. In this regard, the KIs recommend that public sector employees be given adequate training, the right skills, tools, and foremost a stimulating environment for the upcoming challenges of digital transformation.

Nevertheless, there are also some positive examples on digital transformation in the public sector. A KI from a public institution named a few good practices for digitalization that came from the public health, transport and customs institutions in BiH. Particularly, according to the KI, the transport of goods was digitalized with the implementation of New Computerized Transit System (NCTS) that enabled a quick exchange of electronic messages and replaced various paper documents and certain formalities of the customs transit procedure and transportation.

SMEs Digital transformation challenges

In general, SMEs are not aware of the benefits that digitalization could bring, and even if they were, they face challenges with funding investment in digitalization. One of the KIs mentioned that due to the lack of finances, companies also cannot even hire a consultant who would guide them through the process of digital transformation in the proper way. In that regard, the KI mentioned that it would be beneficial to provide new financial resources for digital transformation under some more favorable conditions.

Respondents state that some companies do not adopt digital technologies due to the lack of skills among employees, the need for high investment, as well as insufficient education about available technologies. Moreover, one of the KIs explained that "we have the tech knowledge and that is our advantage, but we lack that technical support. The biggest challenge is business literacy in general, negotiating and creating partnerships, tech solutions, how to launch a product on the market and customer experience.

Furthermore, the knowledge-level of company managers is limited, due to the lack of staff and their own limitations. For this reason, one of the KIs recommended to focus more on raising awareness and

improving management understanding, as they are the ones who make decisions about investments. This can be done through training and seminars, for example about process automation, industry 4.0, AI, data management, etc.

Another challenge which was also emphasized, by one KI, is that the country lacks functional innovation and technology hubs. These hubs would contribute to the construction of an ecosystem for digitization, automation and innovation in BiH SMEs and stimulate SMEs' investments in digitization to increase their market agility and competitiveness. Moreover, they would provide a modern platform to support SMEs in improving business processes, but also their structure and end product. With a wide range of services for SMEs in the form of applied and specific digital solutions, innovation hubs would act as a bridge between digital innovations and the business sector.

Currently, the only launched innovation hubs in BiH are the ones created through the EU4DigitalSME project. These hubs function as partnerships under the leadership of one of the institutions, in particular, LabHUB - Sarajevo under the leadership of the Sarajevo School of Science and Technology, IDEMO HUB - Banja Luka under the leadership of the Innovation Center Banja Luka, Digital Storm HUB - Sarajevo under the leadership of the company QSS d.o.o and Industrial HUB - Tuzla under the leadership of Industrial Automation d.o.o.

Another KI mentioned that BiH lacks an innovation fund. This would improve the connections between science, technology and economy and contribute to encouraging the development of innovative entrepreneurship. Moreover, the fund would serve as the key state actor in the development of BiH's innovation system and contribute to the economic development of the country through various financial instruments. As a good example, the KI mentioned the funds in Croatia and Serbia as one of the first countries in the region to establish the so-called Fund for innovation activity.

Digital transformation initiatives

In addition to policies and strategies, as well as legal and by-law regulations (for which the competent authorities at the state and entity levels are responsible), there are other projects and activities that include digitalization or digital transformation in BiH, especially those initiated by international organizations in BiH.

The German Society for International Cooperation (GIZ) is extremely active in the field of digitalization, and in the last two years has supported the development of digital transformation in BiH through the project "Innovations and digitalization in SMEs in BiH". The public sector is also included in this support, and at the relevant administrative levels, preconditions are being created for the creation of tools and policies that encourage SMEs to initiate processes of innovation and digitalization. Furthermore, with the help of GIZ via this project, the Center for Digital Transformation of the Chamber of Commerce of the RS and the ICT Hub organized a Hackathon in April 2021 on the topic "Digitalization of Sales".

Moreover, the United Nations Development Program (UNDP) actively participates and provides support in the field of improving the level of digitalization of companies and of the public administration. One of the projects implemented by UNDP is Digital Transformation in Business - DigitalBIZ (2020-2022), and in cooperation with the British Embassy in BiH, UNDP is also implementing the Digital Transformation in the Public Sector in BiH project (2020-2024). Furthermore, with the aim of strengthening MSMEs in BiH, the EU4Business project (2018-2022) was launched, which is financed by the European Union and the Federal

Republic of Germany, and implemented jointly by GIZ, the International Labour Organization (ILO) and the UNDP.

In 2022, the European Bank for Reconstruction and Development (EBRD) and the European Union (EU) launched the Go Digital in BiH programme with the aim of helping SMEs invest in the digitalization of their businesses. Additionally, the World Bank, as part of its program PowerUP: Strengthening the capacity of companies in the early stage of development in the countries of the Western Balkans (2020-2021), launched a free dedicated program for more than 200 companies financed by the EU.

In 2021, USAID launched a five-year governance project in support of transparency and reducing corruption in government-led processes. The aim of the project is to provide software, hardware and technical assistance in the areas of e-signature, e-construction permits, inspections services, social registries and public procurement across BiH. Moreover, the project will employ information technology solutions to significantly reduce the amount of time and cost associated with public services and increase the quality and transparency of numerous government functions (PARCO, 2021).

MarketMakers (2012-2023), a project of the Swiss Government, has supported the digitalization of SMEs through different activities in support of sustained youth employment together with the private sector. Among the most important activities was financing web shop creation; launching the IT.karijera.ba portal to improve the availability of IT career-related information to students, graduates, the unemployed; or financing and transferring the know-how for the establishment of business association (e.g., eComm Association, BiT Alliance and ABSL) (MarketMakers, 2022).

One KI mentioned that there were also some smaller events and hackathons in BiH regarding digital transformation, but they only offered some introduction in digitalization and stopped after the donor funds are acquired. Another respondent mentioned that there is a new, local chatbot in their entity, where they are developing AI and integrating it in their administrative procedures for issuance of birth certificates, registration of crafts, information, and procedure regarding stipends for students, etc.

Furthermore, the discussions on digital innovation and transformation in BiH are fostered through other events. For example, the Banking and Finance Committee operating at AmCham (American Chamber) organized a Round Table on the topic "Digital transformation of BiH"; the company Datalab BH organized a panel discussion on the topic "The state of digitalization and the vision of the digital future of the economy of BiH"; and the Chamber of Foreign Trade of BiH contributed through the development program of the information society of BiH, and with the cooperation of Global GPS NJ d.o.o. the Tiimiss conference was held, which presented priorities for society and its digitalization.

According to a KI from an international organization, these digitalization initiatives showed that those SMEs which are aware of the need for digital transformation are more competitive in both BiH and foreign markets, compared to those who lack of awareness on digital transformation, and this increases their internationalization. With this, one of the KIs recommends that it is necessary to raise the awareness among SMEs who do not have a developed awareness of the importance of digital transformation in line with the new reality after COVID-19 and in other situations.

It was noticed, through previous initiatives, that companies whose top management is not informed and open to innovation will often repulse it. For this reason, the KIs emphasized that more focus should be placed on training senior managements on the advantages of digital transformation. Here, the digital innovation resource centers, as part of chambers of commerce, should have the main role, but unfortunately, there is a lack of such centers in BiH and the existing ones do not understand their role,

and their focus is only on their own earnings. Moreover, it is recommended by the KI that the chambers of commerce could organize events to present, for example, good stories about digital transformation from the wood industry, to improve the information flow, and for the companies to understand what modern production is.

Moreover, in terms of the public sector initiatives, line ministries regularly provide grants for the improvement of digital employment of SMEs, for the introduction of new technologies, equipment and new machines and software. The process is very complex and closely related to the development of e-government in BiH, and without it the country cannot talk about a developed information society where companies need to transform. Moreover, one of the KIs emphasized that the administrative procedures in the process of applying for grants and tax benefits are very complicated, time consuming, and often discourage companies from applying. Accordingly, the digitalization of public administration is of key importance, without which the country cannot move forward in the overall process of digital transformation.

Furthermore, at the lower government levels, some KIs mentioned that local self-government units support the digitalization of SMEs through some smaller projects, which are a good first and introductory step in digital transformation. Nevertheless, even though different levels of government in BiH are trying to define measures/ initiatives to achieve the digital transformation of the country, the overall results are barely visible. There are public calls and projects for the digitalization of SMEs in BiH, but according to most KIs, the existing needs of SMEs are not adequately addressed in the public calls, and the support, and effects are rather insufficient.

Building digital and business resilience of SMEs

- Most SMEs in BiH are not aware of the importance of business continuity planning, nor do they invest in their digital resilience.
- A supportive digital policy framework and regulatory environment that empowers SMEs is missing.
- SMEs in BiH lack adequate cybersecurity protection and awareness of the importance concerning cybersecurity protection for their business.

The digital age is the product of a real world need for greater security, more efficient production, more resilient economies, and new ways of working, given the challenges of an ageing population, climate change, the current pandemic, and the continued desire to improve the lives of citizens. To balance the ongoing digital transformation, it is becoming fundamentally important to improve “digital resilience”, an increasingly critical factor for the success of any SME, now and in the future. Digital resilience needs to be regarded as an integral part of the strategy and mission of any business and should be centered around all involved staff in SMEs. (Casalino et al., 2019)

Moreover, regarding the improvement of business resilience, the KIs underlined that knowledge absorptive capacity, knowledge about new technologies, organizational agility, and senior management mindfulness, help in creating changes within business models. If integrated, digital processes are incorporated within the innovation process with care, newly created and improved business models can improve the business and digital resilience and performance of company.

Furthermore, in terms of the importance of business resilience, according to one KI, digital resilience should be an integral part of the company business continuity management, but this aspect of planning is

neglected by most SMEs in BiH. Specifically, as the KI underlines, incorporating digital resilience in the business continuity plan of a company would help the company adapt to changing market conditions and an evolving competitive landscape, respond to disruptions by applying digital governance strategies, and boost their overall cyber defense. Furthermore, one of the KIs explained that "companies lack experience in operating a liberal economy. SMEs primarily serve capital and large companies, and are thus reactive in this sense, waiting for what the world will ask of for, and not to offer and spread their knowledge about digitalization. SMEs should rather increase the resilience of their businesses, develop recovery strategies, and accelerate business' digital transformation. As for the fact that most companies in BiH do not follow the global trends in digital transformation, and more importantly as the regulatory framework is rigid and discouraging to digitization, it is difficult for SMEs in BiH to invest in and improve their digital resilience."

Ensuring that SMEs are more resilient and digitalized than ever before is more than just providing SMEs with a 'technology solution'. It is also about improving the digital capabilities of SMEs and creating new ways of working. In the long run, SMEs need to master new technologies if they want to stay competitive and thrive in this digital revolution.

To achieve this, there is a need for a supportive digital policy framework and regulatory environment that empowers SMEs to seize the enormous opportunities presented by the digital transformation. Moreover, a multifaceted policy response is required to address the identified challenges to SME digitalization. Policies should be flexible enough to combine a range of measures to reflect the needs of different SMEs. SMEs should have incentives and public support to embrace new technologies and to embark on their innovation journey. Even though government programmes have a focal role in strengthening SMEs' resilience to external shocks, this is still not reflected well enough in the SME digitalization policies implemented in BiH.

When it comes to combating digital resilience challenges, most KIs underlined that it is necessary to work on employees' education and digital literacy, because there is a lot of room for improvement. Also, such incentives targeting digital literacy are an important factor for digital resilience, as well as examples of good practice, because companies mostly apply having seen examples of good practice and some successful models from others. In addition, it is difficult to have all the necessary expertise within one institution, and it is good to have the flexibility and possibility of using external expertise, especially in the matter of crisis management.

A business' resilience is defined by its ability to either withstand or overcome the consequences of major incidents, and to adapt to the environment and new circumstances after the incident. The SMEs in BiH, as most KIs underline, still require deep collaboration and understanding to decipher the pseudo-field of business resilience. Particularly, the problem is that companies do not know where to start in terms of building business resilience, how to start, and especially to know when they are at risk and how to recognize it. In this regard, one of the KIs mentioned that BiH lacks a platform where SMEs can ask for help with digital resilience and to learn from other experiences and to recover their businesses.

Business resilience during COVID-19

The global COVID-19 pandemic exposed Businesses to various challenges and their responses were defined by their resilience, which in turn impacted their chances to overcome this crisis. Generally, COVID-19 saw the start of a comprehensive and sustainable digital transformation process, building on digital

SME ecosystems and presenting an opportunity to ensure our SMEs are more adaptable and more resilient than ever before. Although some industries have shown a certain level of resilience or even found a new operating niche, most SMEs, especially, in the services industry found themselves having to adjust to the “new normal”, having to adapt their business models to this changing environment (Gregurec et al., 2021).

The KIs underlined that digitalization in BiH should be divided into before and after the COVID-19 pandemic because it was extremely poor before, although there were some investments in it. But with the pandemic, the SMEs became aware of digitalization trends, so they tried somehow to quickly reach a higher level of digital transformation.

In particular, the KIs mentioned as some positive examples during COVID-19, that the retail sellers of goods or services quickly found an alternative to their brick-and-mortar points of sale by switching to online sales, as for example big local retailers like eKupi, Domod, Imtec, Penny Plus, Amko Komerc, Konzum, SportVision and Intersport. Furthermore, pharmacies also switched to online communication and sales and offered over-the-counter remedies and food supplements. Hotels, restaurants and coffee shops also developed their own web shops or had started using the logistics platforms like Glovo or Korpa.ba. Additionally, the entertainment industry followed the trend and started offering on-demand movies via an online platform in cooperation with Meeting Point and Sarajevo Film Festival.

Furthermore as for the support from international organizations, the KIs emphasized that during COVID-19, the UNDP organized seminars to improve awareness and develop knowledge regarding the development and business continuity plans of companies in crisis situations. Accordingly, one of the KIs recommended the SMEs intensify the adoption of business independence and business resilience strategies, as it is important to introduce flexibility through digital tools and increase the speed of the company's business activities, through digitalization.

Moreover, the same happened in the public sector. Even though e-government in BiH is slowly developing, and the legislators are not aware of how much the country is lagging behind in this matter, a KI emphasizes how the COVID-19 pandemic proved the opposite. During the pandemic, it was noticed that almost all public administration matters were conducted online, and that it is possible to expedite the digitalization of the legal framework, which would in turn support the digital transformation of SMEs.

Additionally, by realizing SMEs economic importance, governments have started to prioritize SMEs support through the COVID-19 pandemic. In particular, the FMRPO recognized the importance of investing in the development of entrepreneurship in the FBiH, and with the support of UNDP in 2021 introduced the grant scheme "Digital transformation of SMEs". The impact of COVID-19 clarified the need to ensure that companies understand what is required to work in the "new reality" and that accepting new technology increases their potential for growth as well as their competitiveness in the recovery phase. Accordingly, through the grant scheme, support was provided with the aim of enhancing the digital transformation of SMEs and strengthening the resilience of SMEs to the crisis caused by the COVID-19 pandemic.

Digital resilience and cybersecurity

The lack of digital capabilities and security awareness makes SMEs a preferred spot for cyber-attacks and can lead to global value and supply chain disconnections. According to APEC (2017) most SMEs without crisis response experience or capabilities often find themselves in a quandary and are at a loss as to who to turn to for help in the event of a digital attack. Even when they manage to implement some form of internal measures, the results of their chosen remedies usually do not materialize quickly enough to be effective, and post-recovery is a race against time.

Cybersecurity is an important aspect of digital and overall business resilience. The focus on cybersecurity should be especially placed on cases where a SME has not sufficiently protected its core activities and it is under the threat of a cyber-attack. An example are the online portals that are often under attack by hackers (Distributed Denial of Service (DDoS) attacks), and if these attacks continue for a long time, they threaten the work and cash flow of the company. (PwC, 2022)

According to the Cybersecurity Ecosystem Report in 2022, Western Balkans is usually not considered as a primary target, instead attacks are often collateral damage from attacks to other primary targets. Governance, technical capacity and awareness are the main recognized risks for cybersecurity. National cybersecurity frameworks are often incomplete or have shortcomings, like overlapping jurisdictions and limited enforcement powers. Targets which attract possible threats are related to legacy systems and equipment, especially in the critical national infrastructure or the public sector. Capacity related issues address the global shortage of cybersecurity experts. Identified needs remain in the domain of defining the national cybersecurity framework, update of the existing legislation, awareness raising, cybersecurity education and more regional cooperation. (PwC, 2022)

The pandemic led to greater numbers of incident reports being submitted to national authorities of the Western Balkans. Among the reported incidents, there were also an increased number of attacks on SMEs, media, and civil society organizations. Cyber-attack can include many different types of criminal activity including malware, ransomware or DDoS attacks, phishing and email and internet fraud. Attacks are getting more advanced, with improved tailoring of dangerous content translated to local languages and context. (PwC, 2022)

When it comes to BiH, one KI stated that companies in BiH have the highest number of cyberattacks compared to the region by far. The KIs underlined that most SMEs in BiH have no real cybersecurity protection or those who do, have it at very low, basic level. Moreover, most common attacks on the SMEs are related to data ransom/theft, social engineering, and poor cyber hygiene. Hijacking of social media accounts and their usage for promoting third party campaigns is also stated as a common cyber-attack. Moreover, many problems related to cybersecurity are a taboo since companies do not share when cybersecurity issue happens.

In particular, the KIs emphasized that SMEs lack the awareness of the cybersecurity threats and are faced with the problems and possible solutions only after the damage caused by the attacks. This lack of awareness on the importance of cybersecurity protection for their business presents the primary cause for the higher rates of cyber fraud, malware or data extortion in BiH SME domain.

Moreover, BiH's complex political and institutional setup also affects the country's cybersecurity landscape as there is no legislative or strategic framework at the national level regarding a national

Computer Emergency Response Team (CERT), which limits the potential for international cooperation regarding the topic of cybersecurity. On the entity level, RS established an entity level CERT RS within the Ministry of Scientific and Technological Development, Higher Education and Information Society, whereas in FBiH the cybersecurity structure has not yet been established, but there is a Draft Law on Information Security prepared by the Federal Ministry of Transport and Communications. (PwC, 2022)

Furthermore, the KIs emphasized that with higher protection efforts, primarily through investments in knowledge and technology, SMEs can lower the possibility of an eventual “successful” cyberattack. In other words, the more secure a business is, the harder and more expensive it is for the attacker to penetrate and harm that business. Accordingly, attackers look for more vulnerable targets, those with weaker protection, and which take less time and effort for a successful cyberattack.

Future of work – digital transformation of workplace

- In general, employees in SMEs do possess main technical skills for their everyday work activities, but the availability and level of specific hard and soft skills of the employees is still missing.
- Most SMEs invest in sector specific software and hardware knowledge, and less in education of employees.
- SMEs are not aware that the nature of work is changing due to digitalization and the emergence of new technologies.

Growth across the SME sector, including the startup and e-commerce sectors, has been slow and much of the resistance to adoption is rooted in employers’ lack of awareness for the need of digital tools. However, the COVID-19 pandemic has been a significant driver of digital transformation and has increased the use of digital tools and services in the economy. Nevertheless, a highly specialized and educated talent pool and a tech and innovation ecosystem that would also contribute to foster the digital transformation of workplace is still missing.

Digital competences of employees

With digitalization, the nature of work is rapidly changing due to introducing emerging technologies, such as AI, big data and IoT in everyday operations. The skills that employers value and rely upon are changing. In turn, a “skills gap” has developed in which SMEs struggle to hire appropriately trained workers, although the unemployment rate remains high (RCC, 2022).

In terms of SMEs’ employees digital skills, most KIs underlined that the employees have basic knowledge of using the e-mail and internet, the Microsoft package, e-banking and similar tools in their work activities. Nevertheless, they also stressed out that there are differences in the usage of digital tools in regard of the employees’ position in the company, e.g., almost all employees in administration are well educated on the use of basic IT tools, but also to use those more advanced tools such as CRM and ERP systems. Especially, when it comes to of ERP systems, most are used by the employees working in accounting and inventory management departments. There are also some examples of employees using Business Intelligence systems for modern reporting on daily, weekly, and monthly levels.

Particularly regarding specific digital competences related to jobs, one of the KIs said that usually, employees in the production parts of the SMEs do not need to use digital tools in companies as their job

description does not foresee it. Only the lead operation managers will need to be educated to use specific software and hardware that is needed in this position. Micro-companies have the largest difficulties when it comes to awareness and usage of digital tools.

While talents with technical skills are present in the digital ecosystem, the availability and level of specific hard and soft skills needs to be strengthened. This need is sharpened by the skill-gap and brain-drain, according to the 2019 Balkan Barometer, brain-drain is increasingly recognized as a problem in BiH. 13% of the BiH citizens surveyed stated that the outward migration of highly skilled people is one of the key problems confronting the economy. Concerns over unemployment (59%) and economic situation (43%) are the two top ranked issues (RCC, 2022).

When it comes to the employee skills that are needed in export-oriented SMEs, some KIs also stressed that there are usually differences between companies that have partner companies in the EU or in other more developed countries and SMEs that are trying to develop more digital processes but are working by themselves without any support from more digital developed partner companies. In most cases, companies that are export-oriented must organize their processes as their partner companies describe. Usually, their processes need to be organized according to specific standards such as ISO and their employees need to have specific training.

Furthermore, the largest differences are seen between young and older employees. According to a KI from an international organization, usually, younger employees do not have any difficulties to learn and use new digital tools that will upgrade their skillset. Older employees usually fear changes and they usually show resistance to any digital improvements – including training or the implementation of new processes and procedures, because they fear that they will lose their jobs if they do not manage to learn the new digital skillsets. Finally, the KIs underline that there are no major differences between women and men in using and learning new digital tools or services.

Finally, low salaries are one of the main reasons why a significant number of qualified employees seek opportunities elsewhere, but other reasons are also the need to have an overall higher quality of life and security for them and their family members (World Bank, 2021). These reasons for emigration concerning the quality of life and security are especially true for ICT professionals that are leaving the country, even though their salaries in BiH are significantly higher compared to salaries in other sectors.

Growing Tech and Innovation Ecosystem

When it comes to the growing network and advocacy mindset, in addition to state policies and legal regulations, and the projects already mentioned, there are also some organizations which focus on digitalization and innovation in BiH. These primarily include associations that provide support through direct access to centralized knowledge and advocacy to SMEs in different businesses sectors, such as the ICT hub Bit Alliance, the BPO hub ABSL, the Association for digitalization and the two Associations for e-commerce.

Moreover, there are also technology parks and innovation incubators across different regions in BiH, such as BIT Center Tuzla, INTERA Technology Park, ZEDA Technology Zenica and the Innovation Center Banja Luka that are supporting the development and growth of the region where they are headquartered. They provide workshops designed to develop soft skills for students and the start-up scene and support adoption of business acumen (International Telecommunication Union, 2018).

The COVID-19 pandemic has contributed to the increase in opening new hubs and coworking spaces, such as HUB 387, Networks, Tershouse, Nest71, Digital Business Space and Cosmohub in Sarajevo or Coworking, Smart office or Lonac hub in Banja Luka. Most of these hubs are privately held and do not have government support, nor do they offer some additional benefits such as mentoring or workshops. For that reason, the prices for renting of coworking spaces are relatively high compared to foreign ones and considering the domestic standard of living. (International Telecommunication Union, 2018)

In terms of the startup scene, innovation and entrepreneurship culture are still in an early stage. Startup entrepreneurs often emerge from ICT companies. Founders of startups tend to be engineers who know very little, or nothing about entrepreneurship. It is for this reason that BiH incubators focus on filling gaps in business-related skill sets, such as training that would allow young entrepreneurs to handle sales, marketing, and project management.

BiH startups face many challenges and problems, but the most noticeable one is a high level of risk aversion. Usually, culture and background often influence young people to stay within their comfort zones, seeking regular employment or public sector jobs. If young entrepreneurs try to start something on their own, with the first failure they usually give up their startup venture and re-enter the regular work force (International Telecommunication Union, 2018).

Another challenge is the lack of funding and cooperation between the private sector, the policy makers, and the startups. To be successful, startups should specialize in niche markets (BH Techlab, 2022). Some local recognized startups are Korpa (food delivery), Bizbook (B2B marketplace), Orea (B2C marketplace for handmade designer brands). There has also been some development in the fintech (financial technology) scene in the last years such as Kviko (wallet based on account-to-account instant payment functionalities (24/7) such as QR code payments and P2P transactions); Cardguard (fraud prevention mobile app for controlling the use of payment cards by the cardholder itself); Ping mobile-banking app (whitelabel); Opa (mobile wallet); Huhu (wallet based on card payments for utility payments).

When it comes to funding constraints, tech startups in BiH rely mostly on funding from personal capital (money from either friends or family), and local and foreign government innovation funds. Currently there are no venture capital firms existing in BiH that would offer funding to foster the startup and innovation scene. (International Telecommunication Union, 2018)

At the beginning of 2022, the first Angel investor Network was initialized with the aim of supporting at least one startup on the BiH market (UN, 2022). Another positive aspect is that the first innovation startup accelerator has been launched in the private sector by BH Telecom, one of three telecom operators in BiH. BH Tech Lab will invest 7.6 mil EUR in the next 3 years in innovative ICT startups that focus on digital transformation based on IoT, AI, big data, blockchain or machine learning solutions (BH Techlab, 2022).

Fostering digital workplace transformation

Most SMEs usually invest in sector specific software and hardware knowledge. In terms of investment in education of employees, micro and small companies usually do not have the need nor the financial possibilities to invest in staff training. According to some KIs, SMEs with greater revenues invest in leadership programs for management positions, in staff advancement, internships, and trainings. A good

example, as one KI mentioned, is the company “Milankovic”³ that offers free of charge trainings in cooperation with a local school to train future employees to work in the wood processing industry. Another example is also company “FEAL”⁴ that invested in education more than 50 employees in education for lean management and similar aspects of education for process improvement.

Moreover, some SMEs, especially in the ICT sector, also have systematic internal training programs for their employees e.g., for specific IT skills, to develop talent internally. The KIs said that in the ICT sector, companies are much more flexible when it comes to creation of digital working environment. Using the new digital communication channels, as the KIs emphasized, allows these companies to offer their employees to work from home or anywhere else in the world.

In terms of the organizational culture of SMEs, according to one KI it is crucial to have awareness of the changing nature of work, due to emerging technologies and digitalization on the side of the employees, but also on the employer’s side. In most cases, employers (owners or managers) in the SME sector are not aware and do not understand that there is a need for change in their current operational practice. One KI underlines that the hardest part is for them to understand the need for workforce development, where employers must identify and signal the skills they need, as well as develop mechanisms to recruit, train, and retain employees. In most cases this is only possible with the support of a consultant or a training organization.

When it comes to programs that foster employee skills, a KI from an international organization said that most SMEs that invest in further employee education and training, are interested in having internal training programs for their staff. They do not agree to have their employees trained outside the company. Moreover, the most often mentioned reason for this situation is that the employees are needed every day in the SMEs operations and the management cannot afford to let the employees leave the company for trainings as the production will suffer.

Furthermore, regarding training, one KI mentioned that another reason for not allowing their employees additional training is that employers had negative experiences when they attended exhibitions in the region, where their employees were acquired by companies in the region such as in Croatia or Slovenia and left the companies because of better salaries in the region with the opportunity to move to other final destinations in the EU soon after.

³ Milinković d.o.o is a company based in Banja Luka and its core business relates to production of furniture and carpentry.

⁴ FEAL d.o.o. is a company based in Siroki Brijeg and its core business relates to production of metal structures and their parts.

E – commerce

- Overall, there is a lack of infrastructure, knowledge, skill, processes, and organizational transformation for e-commerce in BiH.
- The institutional framework for e-commerce is non-existent.
- The shipping, logistics and online payment transaction costs are high.
- Buyers have a lack of trust in security of the online transactions.
- Many SMEs lack expertise to manage an e-commerce business.

E-commerce was existent in BiH during the last decade, but mostly only through a few local companies specialized in digital business models. Moreover, global companies which focus on selling goods have never entered the local market (Amazon, eBay), presumably due to a small market size, unclear legislation, and barriers in cross-border trade.

E-commerce trends

Most KIs agreed that the key characteristics of e-commerce in BiH are an increase in trading volumes, lower costs of operating business in comparison to the traditional retail sales, and the easy and cheap way for testing the business idea or a new concept. Many e-commerce newcomers do not treat online sales differently to other sales channels like the traditional brick and mortar stores or telephone sales.

Nevertheless, according to the KIs, local SMEs usually follow the global trends of online selling models from abroad with the aim of increasing sales and reducing operating costs. Furthermore, the favorable geo-location enables companies to expand their reach to new markets inside the country and abroad. They had started by establishing their own web shops, using existing global brands (WordPress, WooCommerce, Shopify) or simply by using global marketplaces like Facebook, Instagram groups, Booking, Airbnb, OLX, etc. The goods being are a combination of mainly imported or locally produced goods.

Many regional brands, usually SMEs, started their online business just prior to the COVID-19 pandemic and subsequently expanded their already existent retail sales on the Internet (Future of commerce, 2022). BiH followed the global trends of the pandemic and has increased the adoption of sales and e-commerce by pushing business and customers to test and try the buying online. Moreover, the COVID-19 pandemic increased the adaptation of Q-commerce, the fast door-to-door delivery of food and drinks with the expansion of local and global players Korpa and Glovo (Turulja et al., 2021).

Moreover, a KI mentioned that existing initiatives and support programs for e-commerce are also following global trends. In particular, several foreign development projects offer incentives to support local business or associations with their e-commerce projects and agendas (GIZ, UNDP, MarketMakers). In particular, those programs aim to support the growth of the local e-commerce development through organizing syndicated research of online sales and its stakeholders, organization of e-commerce events, meet-ups and conferences, implementation of security trust marks for web shops and educational courses for online sales.

Challenges of e-commerce development

An institutional framework specifically for e-commerce is currently non-existent. The lack of specific legislation, as an external barrier, is keeping the current business from growing. Moreover, research showed that there are no specific incentives which treat or support e-commerce in local or state level of legislation through any programs or agendas. In particular, the incentives which could help online sales to grow, like specific tax benefits for online advertisers who pay taxes for the gross amounts of their clients advertising budgets not just on their service fees, are not available to companies who are in online sales as a part of or their main sales channel.

Moreover, logistics used for sending and receiving goods are offered by public postal service providers and private courier companies offering door to door delivery within 24 hours. Most SMEs use their services since they lack the resources to build and own their own fleet of vehicles for the delivery purposes. As an external barrier, many respondents stated the high shipping and logistics costs and low quality of courier's services. In particular, the current State law for postal transportation services mandates the minimal price of 8 KM (excl. VAT) for parcels up to 5kg.

In fact, the Law on the Postal services dictates the minimal price for several transport services which puts the public providers in the preferred position. It also permits only private providers to transport packaged goods. Both grant monopoly to the public providers of postal services and hinder private companies from offering the same services with lower price or better quality. The current payment transaction law started in 2021 to impose lower interchange banking fees with the goal to enable more companies to use the Internet as their sales channel. The idea is to lower the costs of transaction to levels more acceptable to online sellers (PUFBiH, 2021; Paragraph, 2022).

Furthermore, many SMEs state the problem of digital fiscalisation as a hindering factor for e-commerce. The current law does not recognize digital bills (via email or other digital channel) as valid, and many businesses are still required to distribute hard copy fiscalized bills of purchase to their customers. Furthermore, there are not many payment service providers or banks offering online payment services, which hinders the local e-commerce market's growth and development. Many SMEs state that the lack of competition is the main cause for the high payment transaction costs (up to 4% of the transaction value) (Turulja et al., 2021).

Another challenge is the lack of buyers' knowledge/ trust in the security of online transactions , particularly regarding online payment and online communication (fear of deliberate fraud). Most KIs also stated that the buying habits of internet users in BiH is a big external factor hindering the growth of online sales, but which could be improved with awareness campaigns and promotion. Additionally, one of the internal barriers to e-commerce, according to a KI from an international organization, includes the lack of knowledge and skill of SME employees needed to operate an online sales business.

PRELIMINARY RECOMMENDATIONS

When it comes to the recommendations for further digital innovation ecosystem development, and paths forward, several points should be emphasized. The following recommendations are grouped into key (top priority) and secondary recommendations.

Key recommendations

Digital transformation is of vital importance for the development of SMEs in BiH and for the economy of the country itself. The inevitable process of digital transformation has started and now the government has to see how to manage this process, and to keep in mind the necessary resources for digital transformation. Public sector institutions should, continuing on the previous practices of the international organization projects, work on raising awareness on the importance of digitalization among the SMEs. Moreover, **a faster and better reaction by the regulators at all state and entity levels is needed**, to stimulate, rather than slow down the technological progress. The government should make additional efforts and **work on improving regulations related to the application of digital signatures**, use of cloud services, protection of personal data, access to data registers and others, with the aim of harmonizing the regulatory framework with global trends and building an enabling environment for the accelerated digital transformation of businesses in BiH.

Furthermore, in terms of digital transformation, it is a priority for the government and its institutions, to **align the existing legislation on electronic documents**, electronic identification, and trust services in electronic business with the EU acquis, adjust and adopt the laws on digitalization that are missing and support their implementation. Also, it is necessary that public sector institutions give priority to supporting projects in the field of digital transformation. In that regard, it is necessary that public sector institutions start or continue to enhance the knowledge of public sector employees on digital transformation and strengthening their capacities to work in a new digitized environment. Additionally, it is necessary to **sensitize the public administration to work with SMEs**, and further map regulatory, administrative, and cost obstacles in this area, according to the sectors to which they relate.

Moreover, a key recommendation to increase the awareness and capability level of BiH SMEs, is for the government to **create an online platform as a single source of information for SMEs** who are willing to digitalize, which would include: e-learning training materials (such as modernizing business processes, redesigning jobs and upskilling workforce, using digital technology); digital maturity self-assessments to measure companies' level of digital maturity and get guidance on the business case for digitalization and how to achieve it; access to public support schemes and to the financing programmes available in the country. Specifically, administering the platform would probably fit best under the jurisdiction of MOFTER, given its responsibilities. However, strong engagement by ministries at the entity level would also be needed. This platform could also act as a matching tool between the demand and supply of digital solutions. It would offer a menu of pre-approved digital solutions available to SMEs in specific sectors with the purpose to facilitate SMEs choice of suitable digital solutions.

The focus of the government at all levels should be on **providing resources (e.g., vouchers for investment) and tools that facilitate digital transformation**. Such investment should be aligned with a wider digitalization strategy to digitalize the economy via business ecosystems, including innovative SMEs. It should build on comprehensive public-private partnerships and invest in and reskilling and upskilling programmes in digital technologies and digital literacy. Furthermore, **digital sovereignty should be a key**

policy consideration of the regulators and the SMEs should be able to take advantage of a digital ecosystem based on openness and interoperability. Policy should enable innovative SMEs to better compete and scale up by addressing bottlenecks and unfair practices implemented by digital gatekeepers/ companies that have an entrenched position in digital markets.

Secondary recommendations

BiH is faced with the risks posed by slow or poor adoption of innovations, which can have bad consequences for the economy, the government sector and individuals, or the country. There are companies that have come a long way in terms of digitalization and the use of IoT, AI, but that is a small number. The line ministries should keep in mind that not all SMEs are at the same level of development, so the work methodology of institutions and organizations should be based on strategic principles, analysis of the state and needs of companies according to the level of digital development.

Also, when it comes to tax incentives and support programs, it is recommended that the government and line ministries **give priority to projects in the areas of digital transformation and smart specialization**, and to inform the economy about tax incentives. Particularly, it is necessary to simplify the administrative procedures in the process of applying for support programs and tax benefits and provide support to innovators in the preparatory phase of applying for the programs.

Moreover, the government could **establish resource centers for digital transformation and an innovation fund** at the level of BiH or of the entities, following the good practices of countries in the region, such as Serbia and Croatia. In particular, resource centers could be created at all levels of government, i.e., as part of the respective chambers of commerce, which would act as a business support in the field of digital transformation, would work on improving the knowledge and skills of employees in the economy; providing consulting support and promote and provide informational and advisory services in the field of digital transformation. Moreover, the innovation fund as another possible action, could be established at the state or entity level, with the aim of providing support to innovation activities and managing financial resources to encourage innovation, which mandate would be given by law.

When it comes to building digital and business resilience, SMEs often need external inputs on these matters. Nowadays, the influence of COVID-19 specially motivates SMEs to rethink their core competencies, seek new opportunities, and redefine sustainable business models in a more intense and timely manner. Accordingly, **companies should focus on developing new competencies**, improving experience management, and enhancing the experience of professionals (including academia, consultants, etc.) regarding the application of new technologies within business models which is essential to the long term regional development of SMEs. Moreover, SMEs will not just survive this disruption, but they will emerge capable of adopting new technologies, and become more competitive under these challenging conditions.

When it comes to the digitalization of the e-commerce sector, it is necessary for the government to start with fundamentals and **implement new legal and technical infrastructure**, if the costs for payment and postal services are to be lowered. On the legal side, **the postal laws should be adjusted to EU standards** in a way that should not allow entity owned postal companies to have dominant positions on the market – this would increase competitiveness and the introduction of new services for a better service quality.

The desk review and interview results showed that it is necessary to increase investment in R&D, to improve the innovative environment and the digitalization of SMEs itself. More precisely, it is necessary

that the government provides **incentives for the SMEs to increase budgetary investments in science**, to strengthen the awareness of businesses about the benefits of innovation and R&D activities, and to create conditions for investments to pay off. Furthermore, **SMEs should stimulate greater participation of employees in innovation**, for example, by giving bonuses on earnings, or using the "right to acquire shares" mechanism. Also, given to the lack of adequate knowledge among SME employees, it is an imperative for the SMEs to organize trainings and education regarding digitalization and digital transformation, and even further to support the introduction of technopreneurship courses at faculties.

Another recommendation is for both the demand and the supply side of the market to have access to financial resources. Two aspects should be analyzed in more detailed in the future. The first one is that the **banking industry should expand thematic SME lines to cover digitalization and innovation investments** in BiH. In addition, specific thematic loans could be delivered from special purpose vehicles combining public funds (including potentially the entity development banks or Union bank as the only state-owned bank in BiH) leveraged with private lending facilities. The second one is that the government needs to **enact new laws to enable access to equity financing for innovative SMEs in BiH** that will contribute to scaling-up of the availability of funds of key players in the BiH private equity and venture capital landscape for direct or indirect investments in strategic innovation projects.

Finally, another aspect is that BiH is the only country in the Central European Free Trade Agreement (CEFTA) region that has no Payment Services Directive (PSD2) legislation. PSD2 is the fundamental law for a growing startup, and especially a payment and fintech sector. Almost all online transactions are conducted with Visa or Mastercard payment cards (there are only rare examples where payments are realized using account-to-account transactions – such as with the Kviko or Opa mobile apps). **A centralized payment scheme would be necessary** to allow account-to-account payments or instant payments, which are much cheaper and are used in countries that have an extremely well-developed e-commerce sector, such as the Netherlands or Great Britain, and even in the region, the Serbian National Bank which has implemented such a service. The implementation of such a scheme could be a good example for a joint venture project – matching the supply and demand side - between the Central Bank of BiH that would implement the scheme as an additional service, and the local tech industry, and banks.

Lack of adequate knowledge was mentioned several times as an obstacle to the creation of a digital ecosystem of SMEs. In that regard the **academia and consulting professionals should contribute more to digital transformation** in accordance with their role in the community, by offering more lifelong learning programs on topics of digitalization via open online platforms, performing research, development, and innovation-oriented projects in cooperation with different stakeholders.

Moreover, the response of SMEs to cybersecurity issues is often reactive. As an improvement to this, **government collaboration at all levels** and consultation with external professional consultants or companies specialized in dealing with cybersecurity and protection is suggested. Specifically, additional education and networking would also improve internal resources needed for improvement of the currently lacking knowledge and awareness. Furthermore, it would be recommended to **establish a CERT that would focus on supporting SMEs' cyber protection**. This could be achieved with the support from chambers of commerce, regional development agencies, and/or associations of employers.

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APPENDICES

ANNEX A. List of all interviewed institutions

1. Association for e-commerce “eComm” in BIH
2. BIT Alliance
3. Swiss Entrepreneurship Program
4. WHAM
5. Federal Ministry for the development of Entrepreneurship and Craftsmanship
6. Ministry of Scientific and Technological Development, Higher Education and Information Society of Republika Srpska
7. RS Chamber of Commerce
8. UNDP
9. GIZ
10. EBRD
11. Academic CERT

ANNEX B: Email/ Invite template

Even though most of the interviewees were contacted directly over the phone, some invites were also sent via email, as follows:

PREDMET: Molba za intervju u okviru pripreme Analize digitalnog ekosistema Bosne i Hercegovine za potrebe USAID-a

Poštovani/a gosp./gđo XXX,

Obraćam Vam se u ime USAID-ovog projekta podrške monitoringu i evaluaciji (MEASURE). Trenutno, MEASURE provodi Analizu digitalnog ekosistema Bosne i Hercegovine (DECA). Naime, USAID je objavio je svoju prvu Digitalnu strategiju za 2020-2024. Prva inicijativa u procesu implementacije je DECA, alat za identifikaciju razvojnih mogućnosti i rizika u digitalnom ekosistemu jedne zemlje.

DECA se zasniva na tri stuba: digitalna infrastruktura i usvajanje; digitalno društvo, prava i upravljanje (uključujući digitalne medije, digitalno civilno društvo, i e-upravljanje); i digitalna ekonomija. Istraživanje će osigurati informacije o digitalnim programima i investicijama za donosiocima odluka kako u USAID-u tako i u partnerskim vladama, donatorima, privatnom sektoru i civilnom društvu.

Bićemo Vam veoma zahvalni ako ste u mogućnosti da odvojite sat i pol Vašeg vremena za razgovor o Vašim iskustvima i poznavanju digitalnog ekosistema u BiH. Da li Vam odgovara da održimo sastanak u xxx, x. jula u xx sat? Ako ne, molimo Vas da predložite drugi termin. Biće nam zadovoljstvo da zakažemo video sastanak u terminu koji Vam najviše odgovara.

Vodit ćemo polustrukturirane intervjuje sa nekoliko važnih pitanja i nadamo se da ćemo kroz razgovor s Vama unaprijediti naše znanje o digitalnom ekosistemu BiH.

Hvala Vam i radujem se Vašem odgovoru.

Srdačan pozdrav,

ANNEX C: Interview guidelines

OVERVIEW

Semi-structured interviews with the most important local and international stakeholders in the digitalization reform processes will be organized to support the Digital Assessment. The interviews will be conducted with experts and stakeholders on the ground via an online platform. Their responses will hopefully validate the key challenges identified through systematic analysis, and significantly contribute to defining of further pathways towards sustainable digital innovation ecosystem for SMEs in BiH.

The recommended group of participants for the interview includes: government institutions (such as ministries); relevant public institutions and bodies, NGOs; the business community (as in IT companies); hubs and accelerators; innovation centers and statistical agencies; donor organizations such as USAID, UNDP, GIZ, EBRD, and other relevant stakeholders (e.g., chambers of commerce, academia etc.).

The interviewer will start with the following:

- Personal Introduction
- Explaining the objectives of the survey (e. g. overview and systematic analysis of the digital innovation ecosystem for SMEs in BiH; 1st stage was the desk review; 2nd stage are the interviews, etc.)
- Refer to the confidentiality of the interview

INTRODUCTION

At the beginning, participants will be asked about their background, and their general information.

1. First name, function and field within in the institution?
2. Entry date and length of employment?

DISCUSSION TOPICS/OUTCOMES

Section A: Digital transformation of SMEs

3. In what manner does the existing policy and legal framework support and stimulate digital transformation and innovation in the SME sector?
4. To your knowledge and experience, do SMEs use digital technologies such as IoT, big data analytics, artificial intelligence in their everyday operational routines?
5. Do you collaborate with SMEs, and for what purpose?
6. Are you familiar with any existing initiatives, projects and digital innovation and transformation support programs for SMEs? Are you aware of any lessons learned from these programs or initiatives? Have some specific sectors shown greater progress in digital transformation compared to others, or if some specific sector is lagging behind?
7. What are the current trends in the digital transformation of the SME sector in BiH?
8. What are the biggest challenges of digital transformation in the SME sector? What public services should be digitalized to ensure a more friendly business environment for SMEs?

Section B: Building digital and business resilience of SMEs

9. To your knowledge and experience, how can the digital and business resilience of SMEs be supported?
10. Which factors could foster the building of a digital and resilient business model for SMEs?

Section C: Future of work – digital transformation of workplace (in SME sector)

11. To your knowledge and experience, in which ways do SME employees use digital technologies and tools in work activities, and how much can they contribute to the work and efficiency?
12. To your knowledge and experience, how are the digital competences/ skills of employees in SMEs (especially according to age, gender, education, company position) and how can they be improved (investment in equipment, buildings, and IT, ICT training to your employees, websites)? Are you familiar with some examples of good practices when it comes to improving the digital skills of employees?
13. In what measure can digital competences and the innovativeness of employees contribute to a more successful digital transformation of the working environment in SMEs? What role does the awareness and vision of the management have in supporting digital transformation?
14. What do SMEs do, or what they could do regarding the creation of a digital working environment, redesign of workplace, etc..?

Section D: E-commerce (in the SME sector)

15. To your knowledge and experience, what are the main factors influencing promotion and development of e-commerce in SMEs?
16. In what manner does the existing policy and legal framework support and stimulate e-commerce development?
17. What are the biggest (internal and external) challenges to e-commerce development in the SME sector?
18. Are you familiar with any existing initiatives, projects, and support programs for e-commerce? If not, what could be introduced? What can the association do to support e-commerce adoption?
19. What are the trends in BiH when it comes to e-commerce? What are the benefits and/ or disadvantages of e-commerce for the SME sector and BiH?

Section E: Cybersecurity

20. What steps are SMEs taking to secure their network from external threats (in their e-commerce, internal and email systems)?
21. Are you addressing any cybersecurity initiatives or methods for protection of e-commerce in the SME sector?
22. Are you familiar with the different kinds of cybersecurity threats to SME companies operating in e-commerce?
23. How is the awareness of SMEs to ensure their cybersecurity and what are the main reasons that some SMEs do not invest in their cybersecurity (is investment in cybersecurity seen as a cost or investment)?
24. What would you recommend as the next steps in ensuring greater cybersecurity of SMEs in BiH? Are you aware of any cybersecurity attack experienced by an SME (what kind of attack it was, how was the issue resolved, did the company experience any loss; who did it)?

ANNEX D: Definitions

Cybersecurity

Cybersecurity, or information technology security, is the protection of computer systems and networks from information disclosure, theft of, or damage to their hardware, software, or electronic data, as well as from the disruption or misdirection of the services they provide (Garcia-Perez et al., 2022).

Digitalization

The basic idea of digitalization is the efficient and complete use of information and communications technology tools, while the main purpose of digitalization is to improve access and business operations. To many, digitalization is simply the adoption of digital technologies to enable a digital economy. Hadi (2020) underlines that digitalization and digital transformation are much more than this. Digital transformation is best defined as the adaptation of systems in businesses, households, and government to address real world challenges. Moreover, by digitalizing their business processes, SMEs make business transactions more profitable and save time (Babu and Chakravarty, 2014). For example, operating on an e-commerce platform or website can give SMEs the opportunity to increase sales and access new customers both locally and internationally. Also, e-commerce enables flexibility of time, geographic location, and product delivery.

Digital resilience

In the business world, resilience is understood as crisis management and business continuity, as well as responding to all types of risks that organizations may face, ranging from cyberspace threats to natural disasters, and many others. The term “digital resilience” therefore, refers to the competences of SMEs to respond to and recover from digital crises such as Internet security threats and cyber-attacks. (Casalino et al., 2019)

Digital transformation

Digital transformation can be defined as the change in the way a company uses digital technologies to develop a new digital business model, and helps create new value for the company (Verhoef et al., 2021). Digital transformation is by its nature multidisciplinary, as it includes changes in strategy, organization, information technologies, supply chains and marketing. In this regard, business success requires an increased understanding of how companies can gain a sustainable competitive advantage, by transforming their business, what strategies they should adopt to improve their business, and how to change their organizational structure to support the new strategy.

E-commerce

E-commerce can be defined as the activity of electronically buying or selling of products via online services or over the Internet. For a transaction to be conducted, it is not only necessary to have an internet connection, but also several other stakeholders that enable sellers and buyers to complete the transaction. Online payment is not mandatory in the purchase process since the payment can be done in cash on delivery, but it increases the buying satisfaction and total sales numbers. Logistics for the subsequent transporting the goods, are an important part of the online buying process and affect the number of transactions significantly (Future of commerce, 2022).