Impact of Digitalisation on the Competitiveness of SMEs in Slovakia

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Abstract: This paper examines the impact of digitalization on the competitiveness of small and medium-sizedenterprises (SMEs) in Slovakia. In a rapidly changing business landscape, SMEs face many challenges and opportunities brought about by technological advances. The study analyses how digital transformation affects key competitiveness factors such as operational efficiency, market access, innovation capabilities and customer engagement. The data was collected through available stastistic data, providing insights into the current adoption of digital technologies and the barriers that businesses face in effectively using these tools. The findings suggest that SMEs which are using digital solutions show increased productivity, better market adaptability and improved customer satisfaction, which contribute significantly to their competitiveness. Nevertheless, challenges such as limited financial resources, lack of digital skills and inadequate infrastructure persist and hinder the wider adoption of these solutions. The paper concludes with recommendations for policy makers and business support organisations on how to create the conditions to foster digital growth, which is key to increasing the resilience and global competitiveness of Slovak SMEs.

Keywords: digitalisation, competitiveness, SMEs
JEL Classification: O31, M10

1 Introduction

The impact of digitalization on the modern business environment is extensively studied, with numerous studies emphsizing the role of digital technologies in enhancing business efficiency and competitiveness (Brynjolfsson & McAfee, 2014). SMEs, which make up a significant portion of economies, face challenges in adopting technologies due to often limited resources and technical capacities for fully leveraging the advantages of digitalization (Matt, Hess, & Benlian, 2015; Bharadwaj, El Sawy, Pavlou, & Venkatraman, 2013). Digital technologies offer SMEs opportunities not only to improve productivity but also to expand market access and increase customer satisfaction key factors for achieving a competitive advantage (Porter & Heppelmann, 2015; Yoo, Henfridsson, & Lyytinen, 2010). Nevertheless, SMEs frequently encounter barriers that hinder their digital transformation, including insufficient financial resources, lack of technical skills, and unprepared infrastructure (Grenčíková A., et. al, 2020). These limitations are often associated with uncertainties about the return on investment in digital technologies (Sebastian et al., 2017). The COVID-19 pandemic during the years 2020-2021 has also accelerated digitalization, leading to significant shifts in the business environment. This pressure has forced many SMEs to adapt their processes and transition to digital platforms, thereby improving their ability to respond to new market conditions (McKinsey & Company, 2020; Wessel, Thies, & Benlian, 2020). This study examines the impact of digital transformation on the competitiveness of SMEs in Slovakia through surveys and interviews with representatives of these businesses. We analyze how digitalization affects key aspects of competitiveness, such as productivity, flexibility, and customer satisfaction. These factors are frequently considered critical for the success of SMEs that implement digital solutions (Teece, 2018; Li, Su, Zhang, & Mao, 2018). Findings confirm that companies with effective digital transformation exhibit higher productivity and an enhanced ability to swiftly respond to market demands, ultimately supporting their competitiveness (Westerman, Bonnet, & McAfee, 2014; Kane et al., 2015). Aditionally, the work by Bresciani, Ferraris, and Del Giudice (2018) demonstrates that implementing digital innovations contributes to greater business dynamism and adaptability to market changes. Verhoef et al. (2021) further emphasize that digitalization significantly influences competitive advantage through improved data analysis and customer relationship management, thereby strengthening SMEs' long-term sustainability. The aim of this study is to provide recommendations for policymakers and organizations supporting SMEs to create a conducive environment for broader adoption of digital technologies. Digitalization is regarded as a crucial factor for long-term competitiveness and resilience of SMEs in the

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global market, and thus, it should be included in strategic goals for SME development in Slovakia (Chanias, Myers, & Hess, 2019; Nambisan, Lyytinen, Majchrzak, & Song, 2017).

2 Methods

The main objective of this study is to analyze how digitalization affects the competitiveness of SMEs in Slovakia, focusing on aspects like productivity, market access, customer satisfaction, and overall digital integration. Fulfilling the main objective was carried out through a literature search of currently available literature research and studies carried out for the period from 2013 to 2023. Secondary data were processed through available sources based on scientific databases Eurostat, Digital economy and society index (digitalization of SME, competitiveness of SME, digitalization and inovation of SME).

In this paper, the main focus is on finding answers to the research questions:

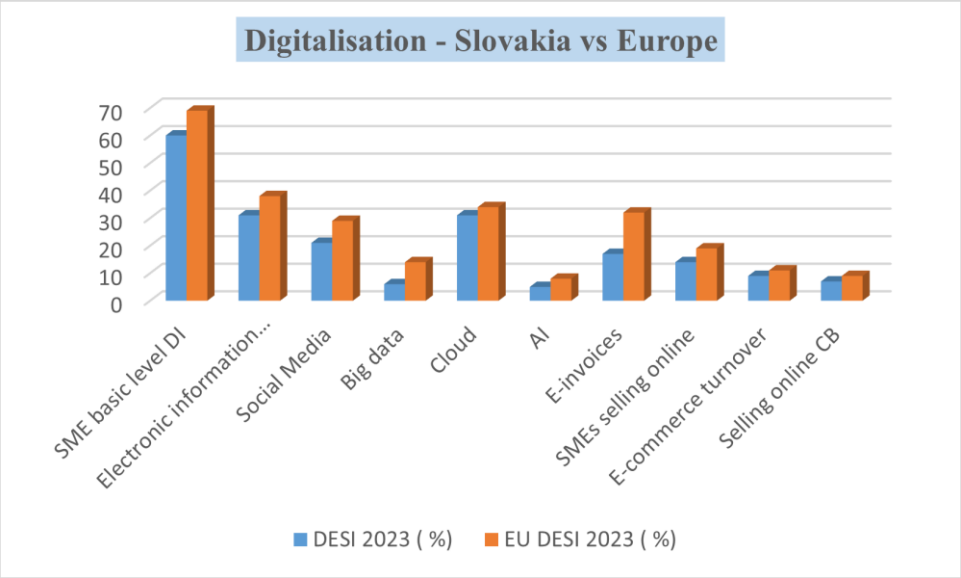
1. What is the current level of digitalization among SMEs in Slovakia?"

2. How does digitalization impact key competitiveness factors such as productivity and market reach among Slovak SMEs?

3 Research results

Based on the available sources, we present in Chart 1 Digital comparison Slovakia vs EU average for year 2023 based on Digital economy society index for year 2023

Chart 1



Source: own processing based on file *file:///C:/Users/Lenovo/Downloads/SK_country_report_dGHtuRCQNA-Aet0dv9vchl6g4_98633.pdf*

This chart compares several digitalization indicators between Slovakia and the EU average for 2023, based on the Digital Economy and Society Index (DESI). It highlights the percentage of SMEs adopting various digital technologies and practices, providing insights into areas where Slovak SMEs lag or match up to EU standards.

Key Indicators and Insights:

1. SME Basic Level of Digital Intensity (DI):
    - Slovakia (approx. 60%) vs. EU Average (approx. 68%).

- Observation: Slovak SMEs show a slightly lower level of basic digital intensity compared to the EU average. This suggests that while many Slovak SMEs meet basic digitalization requirements, there is still room to improve their overall digital engagement.

2. Electronic Information Sharing:
    - Slovakia (approx. 40%) vs. EU Average (approx. 55%).
    - Observation: Slovakia lags behind the EU average in electronic information sharing, indicating that Slovak SMEs may not be fully utilizing digital tools for data and document exchange, potentially limiting their operational efficiency.
3. Social Media Usage:
    - Slovakia (approx. 35%) vs. EU Average (approx. 45%).
    - Observation: Slovak SMEs are less active on social media compared to their EU counterparts. Given the importance of social media in digital marketing and customer engagement, this represents a missed opportunity for SMEs to enhance their market presence and customer outreach.
4. Big Data:
    - Slovakia (approx. 10%) vs. EU Average (approx. 20%).
    - Observation: Slovakia is significantly behind the EU average in big data adoption. This could limit SMEs' ability to analyze customer trends, optimize operations, and make data-driven decisions that could enhance competitiveness.
5. Cloud Computing:
    - Slovakia (approx. 40%) vs. EU Average (approx. 50%).
    - Observation: Cloud adoption in Slovakia is lower than the EU average. Cloud computing is crucial for flexible, scalable operations, and this gap may indicate barriers such as cost or lack of technical skills that prevent SMEs from leveraging cloud-based services.
6. Artificial Intelligence (AI):
    - Slovakia (approx. 5%) vs. EU Average (approx. 8%).
    - Observation: Both Slovakia and the EU show low levels of AI adoption, though Slovakia is slightly behind. This suggests that AI technologies are still emerging, and many SMEs may not yet be investing in AI-based solutions.
7. E-Invoicing:
    - Slovakia (approx. 30%) vs. EU Average (approx. 40%).
    - Observation: Slovakia’s e-invoicing adoption is lower than the EU average, indicating that a significant number of SMEs may still rely on traditional invoicing methods. E-invoicing can streamline financial operations, so this is an area for potential improvement.
8. SMEs Selling Online:
    - Slovakia (approx. 15%) vs. EU Average (approx. 20%).
    - Observation: A smaller percentage of Slovak SMEs sell online compared to the EU average, which limits their market reach and revenue potential. Expanding e-commerce activities could enhance competitiveness, especially in the post-pandemic economy.
9. E-Commerce Turnover:
    - Slovakia (approx. 7%) vs. EU Average (approx. 10%).

- Observation: Slovak SMEs generate a lower percentage of their turnover from e-commerce activities compared to the EU average, indicating that they are not fully capitalizing on digital sales channels to drive revenue growth.

10. Selling Online Cross-Border (CB):

- Slovakia (approx. 7%) vs. EU Average (approx. 9%).
- Observation: Cross-border e-commerce is also less prevalent among Slovak SMEs compared to the EU average. This suggests that many Slovak SMEs are missing out on the opportunities offered by the broader European market.

4 Conclusion

Based on the results from the research part, we conclude the answers to the research questions as follows:

RQ1 - What is the current level of digitalization amongs SME in Slovakia?

The current level of digitalization among Slovak SMEs, as indicated by DESI 2023 data, shows that while the majority of SMEs have achieved a basic level of digital intensity (around 60%), Slovakia still lags behind the EU average in several critical areas. Key gaps include advanced digital technologies such as big data analytics and artificial intelligence (AI), where Slovak SMEs are significantly underrepresented compared to their EU counterparts. Moreover, the adoption of essential digital tools like cloud computing and electronic information sharing remains below the EU average. These shortcomings suggest that while Slovak SMEs are making progress in digitalization, they face substantial challenges, such as limited financial resources, a lack of digital skills, and inadequate infrastructure support. To close these gaps, targeted investments in digital tools, enhanced training, and public policy support are essential.

RQ2 - How does digitalization impact key competitiveness factors such as productivity and market reach among Slovak SMEs?

Digitalization has a direct positive impact on the competitiveness of Slovak SMEs, particularly in areas such as productivity, market reach, and customer engagement. SMEs that have adopted digital technologies such as e-commerce, cloud computing, and social media report improved operational efficiency and increased opportunities for market expansion. However, the relatively low percentage of SMEs engaged in online sales and cross-border e-commerce suggests that many are not fully leveraging digital tools to enhance their market reach. Those that have embraced digital solutions have demonstrated stronger performance in terms of customer satisfaction, speed to market, and overall agility. However, the low adoption rates of advanced technologies like AI and big data hinder the ability of many Slovak SMEs to compete effectively on a global scale. To maximize competitiveness, SMEs need to focus on integrating these advanced technologies and expanding their digital footprint, both domestically and internationally.

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