THE INFLUENCE OF ASPECTS OF INDUSTRY 4.0 AND SOCIETY 5.0 ON THE BUSINESS OF DOMESTIC SMEs

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Stručni članak

Abstract:
This paper analyses the operations of domestic small and medium-sized enterprises (SMEs) in the conditions of the modern business environment, as brought about by the aspects of Industry 4.0 and Society 5.0. The globalized market and escalating geopolitical conflicts have already brought, and will be increasingly bringing, a series of challenges to companies. In order to achieve competitiveness, the focus of SMEs should be on continuous improvement of quality and operations. Finally, the approach to business improvement is considered, which takes into account the technologies of Industry 4.0 and the framework of Society 5.0 and their effect on business processes, which provides insight into the necessity of continuous improvement of business processes.

Keywords: Industry 4.0, Society 5.0, SMEs, business process.

JEL Classification System: M21, F6, O1,

1. INTRODUCTION

Escalating geopolitical conflicts have shaken global supply chains and with it the global economy. The new business paradigm that arose as a result of the aforementioned influences, as well as the impact of the development of technologies that characterize the fourth industrial revolution - Industry 4.0, brought a series of challenges for domestic companies when it comes to achieving and maintaining competitiveness in the globalized market. Application of modern technology in various business processes, improvement of business quality and creation of value for product users play a significant role in achieving competitiveness.[55]

Effective quality management has been shown to improve innovation processes and competitiveness. Domestic companies lag behind companies operating in developed countries. Inadequate competitiveness of domestic companies is the result of low product quality, low productivity, and outdated production equipment.[56] Industry 4.0 is characterized by technologies such as cloud computing, Internet of Things (IoT), Internet of Value (IoT, Big Data and Big Data Analytics and Big Data Analytics), 3D printing, cyber-physical systems, etc.[57] The aforementioned technologies have brought major changes to the market and companies that have managed to implement some of these advanced technological solutions have achieved a better starting point when it comes to competitive ability in the market.

The new business paradigm also imposes the concept of sustainable development, i.e. sustainable business. Additionally, but for the economic aspect, the company's operations must also take into account the social aspect, i.e. the impact on both the individual and the local and wider community. Socially responsible and sustainable business is part of the concept of Society 5.0, which is based on data and data flow in cyber space. This data is retrieved, analyzed and stored in various systems that include data centers, cloud computing technologies, service solutions,

[55]Cvjetković, M., Đorđević, D., & Ćoćkalo, D. (2017). Influence of knowledge and quality on business performance of companies in Serbia, *Tehnički Vjesnik = Technical Gazette*, 24(3), pp. 847-853.

[56] Bakator, M., Đorđević, D., Ćoćkalo, D., Ćeha, M., & Bogetić, S. (2021). CRM and customer data: Challenges of conducting business in digital economy. *Journal of Engineering Management and Competitiveness (JEMC)*, 11(2), pp. 85-95.

[57] Frank, A. G., Dalenogare, L. S., & Ayala, N. F. (2019). Industry 4.0 technologies: Implementation patterns in manufacturing companies. *International Journal of Production Economics*, 210, pp. 15-26.

business applications, key value stores related to society-focused industries. Society 5.0 aims to increase living standards through financial and technological progress.[58]

The basic principles and characteristics of the fourth industrial revolution - Industry 4.0, the basic principles and factors that make up the concept of Society 5.0, and the approach to business improvement, which is based on these concepts will be presented in this paper. The goal is to indicate guidelines for improving the operations of domestic small and medium-sized enterprise.

2. CHALLENGES OF SMEs WITHIN THE FRAMEWORK OF INDUSTRY 4.0

Small and medium-sized enterprises (SMEs) must adapt to changes brought partly by globalization of markets, and partly by Industry 4.0. Managing operations within Industry 4.0 involves three main aspects of SME business models: value creation (tasks and processes operating within a business ecosystem with the aim of providing value to the customer), value proposition (specific, individual products and services of the enterprise offered to the customer), and value monetization (the way compensation is received from the customer). Industry 4.0 not only changes production systems but also the entire work and living environment. It is obvious that modern technologies characterizing the concept of Industry 4.0 have the ability to create value for user needs. The principles of Industry 4.0 are interesting for SMEs because they provide technologies that can improve the flexibility, adaptability, and responsiveness of business.

Some of the main technological solutions that characterize the concept of Industry 4.0 include real-time data management, virtualization, interoperability, agility, decentralization, integrated business processes, higher levels of personalization, and a focusing on services. Through the application of modern information and communication technologies (ICT), SMEs have the opportunity to efficiently develop innovations that add value to product users, thereby increasing their competitive ability in the global market.[59] Industry 4.0 technologies enable enterprises to develop newer, more resource-efficient business models that can result in better business performance.

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[58] Potočan, V., Mulej, M., & Nedelko, Z. (2020). Society 5.0: Balancing of Industry 4.0, economic advancement and social problems. *Kybernetes*, 50(3), pp. 794-811.

[59] Wahyuningtyas, R., Disastra, G., & Rismayani, R. (2022). Toward cooperative competitiveness for community development in Economic Society 5.0. *Journal of Enterprising Communities: People and Places in the Global Economy,* pp. 594-620

The risks of implementing Industry 4.0 technologies in SMEs include a lack of expertise among the company's human resources, short-term strategies without long-term strategic goals, and the rapid pace of technological advancement which could render newly introduced technology obsolete before its implementation in all business processes. Additionally, there may be resistance from employees who perceive Industry 4.0 technologies as a means of surveillance. Due to these risks, SMEs have to conduct employee training, perform a detailed analysis before launching a project, establish adequate communication channels between employees and managers, and foster an atmosphere of responsibility acceptance and promote support at all levels of implementation.

It is evident that operating within the framework of Industry 4.0 requires SMEs to implement and apply technologies that enable increased innovation, productivity, and product quality in order to achieve and maintain a competitive position in the market. However, as mentioned earlier, there is a risk associated with the implementation and application of these modern ICT solutions. Therefore, SMEs must carefully consider the balance between benefits and risks to avoid failure, especially in highly dynamic markets such as high-tech markets.

Operating within the framework of Industry 4.0 and the application of modern ICT entail autonomous production lines, integration of business processes via the Internet, horizontal integration for enhanced and efficient collaboration among enterprises, vertical integration of different subsystems aimed at improving the flexibility of production lines, and support for product and service adaptation to changes occurring within supply chains.

3. SUSTAINABLE BUSINESS PRACTICES FOR SMEs WITHIN SOCIETY 5.0

The concept of Society 5.0 can be seen as an initiative proposed by the Japanese government in 2016. This concept focuses on the well-being of people, increasing human safety, protecting and preserving the environment, and fostering collaboration among social, economic, and political ecosystems.[60] The connectivity of these ecosystems is realized through cyber-physical systems. Society 5.0 is aligned with the goals of sustainable development and is based on vast amounts of data accumulated through cyberspace.

[60] Fukuda, K. (2020). Science, technology and innovation ecosystem transformation toward Society 5.0. International *Journal of Production Economics*, 220, 107460.

The data are collected, analysed, and stored in various systems, including data centres, cloud computing technologies, service solutions, business applications, and repositories of key values related to industries focused on social aspects and the well-being of local and broader communities.[61] Society 5.0 aims to increase the standard of living through financial and technological advancement.[62] Although originating from Japan, it is intended for a wider audience in other countries and takes into account all sustainable development goals.

The main platforms and concepts that define and provide a framework for Society 5.0 are:[63]

- Energy value chains aimed at reducing energy waste;
- New production systems that are agile and increase productivity;
- Infrastructure maintenance systems and update platforms;
- Society's resilience to natural disasters and harsh living conditions;
- New business models and service models to increase value for consumers;
- Global environmental information network with management platforms;
- Integrated material development systems and necessary supporting infrastructure;
- Smart manufacturing systems and smart food supply chain systems to reduce waste;
- Intelligent transport systems with advanced logistics and efficient distribution;
- Advanced implementation of social insurance;
- Utilization of data for human resources development;
- Development of information communication platforms.

The concept of Society 5.0 in the context of sustainable development can be seen as the relationship between social dimensions with technology, science, industry, and the economy aimed at creating sustainable infrastructure for modern business. The technologies that characterize Society 5.0 are present in SMEs in various capacities.[64] It is important to note that the sustainability of the implementation of certain technologies largely depends on the approach and long-term strategy of the enterprise. Society 5.0 encompasses the development of smart cities with economic efficiency; the development of global innovation ecosystems; building resilient infrastructure;

[61] Leng, J., Sha, W., Wang, B., Zheng, P., Zhuang, C., Liu, Q., . . . Wang, L. (2022). Industry 5.0: Prospect and retrospect. *Journal of Manufacturing Systems, 65*, pp. 279-295.

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[64] Holroyd, C. (2020). Technological innovation and building a 'super smart' society: Japan's vision of society 5.0. *Journal of Asian Public Policy*, 1-14.

increasing food production through smart agriculture; developing early warning systems to prevent disease spread; developing e-learning systems with advanced ICT; empowering women through various learning platforms; efficient management of electricity through smart grid systems, and so on. Society 5.0 integrates important issues of sustainable development and ways to address those.[65]

The approach to business improvement has to take into account Industry 4.0 technologies and the frameworks of Society 5.0, which influence business processes. Business processes go through several main stages: process and technology evaluation, technology selection, resource allocation, solution implementation, and application of implemented solutions. The technologies characterizing Industry 4.0 and Society 5.0 contribute to the improvement of business processes through automation, real-time management capabilities, the development of employee platforms, agile and smart business systems, and sustainable business processes.

All changes and improvements are evaluated through feedback from internal (machine operators, management, engineers, etc.) and external business environments (product users, competitors' reactions, market share, sales, etc.). Based on this feedback, additional changes and modifications to business processes are implemented.

4. GUIDELINES AND RECOMMENDATIONS FOR IMPROVING THE BUSINESS OPERATIONS OF DOMESTIC SMEs

Based on the analysed literature, as well as the overview of obstacles and requirements posed by the domains of sustainable development, Industry 4.0, and Society 5.0, the following guidelines are proposed for improving the business operations of domestic enterprises:

1) Opportunities offered by Industry 4.0 technologies should be systematically introduced at all levels of business operations.
2) Companies should consider implementing modern ICT to enhance specific, if not all, areas of business.
3) Quality, productivity, and innovation should be the three main focal points when considering the new implementation of ICT.

[65] Carayannis, E. G., Dezi, L., Gregori, G., & Calo, E. (2021). Smart environments and techno-centric and human-centric innovations for Industry and Society 5.0: A quintuple helix innovation system view towards smart, sustainable, and inclusive solutions. *Journal of the Knowledge Economy*, pp. 1-30.

4) Innovation should not only focus on products and services but also on business processes and overall business models. Innovations should be sought in both external and internal business environments.
5) When considering the implementation of Industry 4.0 technology, companies must clearly define their operational objectives as well as their long-term strategic goals.
6) Designing and predicting future trends and needs of the company can later save resources, as upgrades would be minor changes rather than costly revisions of previously applied ICT.
7) SMEs should assess their supply chains and consider strategies that are optimized and sustainable in the long term.
8) The impact of business on the environment must be analysed, and negative effects must be limited to sustainable levels.
9) Inclusivity within employment and operations becomes imperative, giving SMEs a new, social dimension.
10) Companies should focus on the efficient use of resources.
11) SMEs should focus on creating value for customers and society as a whole.
12) Companies should implement advanced ICT to bring their operations closer to sustainable levels.

The recommendations listed take into account the opportunities of the domestic economy and domestic SMEs and represent starting points for changes regarding sustainable development within the framework of the Industry 4.0 concept and business operations within the Society 5.0 framework.

5. CONCLUSION

Managing a company in the new business paradigm demands flexibility, innovation, and knowledge. Companies must adapt to the situation arising from the COVID-19 pandemic, geopolitical conflicts, and market globalization. Developing new business strategies that will be adaptable to new market developments is imperative for survival in the international market. Without enhancing business processes in terms of innovation, productivity, and sustainability, achieving significant competitiveness is practically impossible. Continuous improvement that takes into account Industry 4.0 technologies and the concept of Society 5.0 plays a significant role in the new business paradigm.

For future research, studying and analysing other potential factors and mechanisms that constitute the modern business environment are recommended. Additionally, future research can

be conducted in the domain of business processes of domestic SMEs and contemporary methods for their improvement.

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