

Changes in the need for digitization during the COVID-19 pandemic

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Abstract: *The digitization and automation of production and logistics technology as part of Industry 4.0 bring many positive aspects. They create the conditions for expanding production capacities, enforcing in a competitive environment by increasing productivity and quality of produced products, new opportunities and new customers, replacing people in dangerous operations and events. This paper deals with the changing perception of the need for digitization brought about by the COVID-19 pandemic.*

Keywords: DIGITALIZATION, PANDEMIC, SAFETY AND SECURITY, INDUSTRY 4.0

1. Introduction

In a modern enterprise operating in the conditions of digital transformation, the main priority of business development is to create and exploit the potential of available digitalization opportunities. The COVID-19 pandemic has changed the situation considerably and there has been an increasing emphasis on digital transformation. The pandemic has had the opposite effect on digitalisation and intelligent automation, as it is new technologies that provide the solution to a crisis situation. Digital transformation and the adaptation of new technologies, closely linked to the revision of internal and external processes, is becoming a question of survival for many enterprises [1].

2. Digitization within the EU

Digitalization is one of the European Union's top priorities. The Digitalization should also help in the transition to a greener economy and in achieving climate neutrality by 2050. The EU wants to improve the digital skills of its population, provide training for workers and move towards digitalization in public services that respects fundamental rights and values. The European Commission launched the Digitising European Industry (DEI) initiative back in April 2016. As part of the Digital Single Market Strategy, the DEI aims to strengthen the EU's digital competitiveness and ensure that every business in Europe can benefit from digital innovation [2].

Based on the various initiatives to digitise industry and the economy at national level, the activities of DEI are structured into five main pillars:

Pillar 1 - A European platform for national initiatives to digitise industry.

Pillar 2 - Digital innovation centres.

Pillar 3 - Strengthening leadership through partnerships and industry platforms.

Pillar 4 - Regulatory framework for digital technologies.

Pillar 5 - Preparing Europe's citizens for the digital future.

In April 2021, the European Parliament approved the Digital Europe Programme. It is the first ever Union financial instrument to bring technology closer to citizens and businesses. The programme should fund digital infrastructure and strategic technologies to improve Europe's competitiveness, help the transition to a greener economy and ensure technological sovereignty. In total, it should invest almost €7.6 billion in five areas: supercomputers (€2.2 billion), artificial intelligence (€2.1 billion), cybersecurity (€1.6 billion), advanced digital skills (€577 million) and mainstreaming digital technologies (€1.1 billion) [2].

3. Digitalization in enterprises

The digitalization and automation of production and logistics technologies as part of Industry 4.0 bring a number of positive aspects to enterprises. They create conditions for expanding production capacities, asserting themselves in the competitive environment by increasing productivity and quality of manufactured products, new opportunities, and new customers, replacing humans in hazardous operations and events [5]. The different stages of digitalization in enterprises can be summarized in 5 basic stages:

Stage 1 - Basic level of digitalization: The enterprise does not address Industry 4.0, requirements are not met or only partially met.

Stage 2 - Interdepartmental digitization: The enterprise is actively engaged in elements of Industry 4.0. Digitalization is being implemented in various departments and the first Industry 4.0 requirements are being implemented across the enterprise.

Stage 3 - Horizontal and vertical digitalization: The enterprise is digitalized horizontally and vertically. Industry 4.0 requirements have been implemented within the enterprise and information flows have been automated.

Stage 4 - Complete digitalization: The enterprise is completely digitalized even beyond the enterprise boundaries and integrated into value networks. Industry 4.0 approaches are actively pursued and embedded within the corporate strategy.

Stage 5 - Optimizing complete digitalization: The enterprise is a model for Industry 4.0 activities. It works closely with its business partners and therefore optimises its value networks, Fig. 1.

4. Digitalization and risks

Risks in the context of digitalization begin with an assessment of all the impacts (risks, opportunities, and changes) that may affect the organization in a given environment, Fig. 2.

On the one hand, it is necessary to identify the requirements imposed by customers and stakeholders and, on the other hand, the inherent requirements ensured by the operation of the enterprise. Subsequently, it is necessary to consider all the activities carried out within the set processes and their impact on the fulfilment or non-fulfilment of these requirements. These activities are based on specific sources, e.g., the political situation in the organisation's location, and may represent threats arising from the dissatisfaction of certain social groups. The degree of dissatisfaction, i.e., the magnitude of the impact of this parameter, depends on a closer examination of its characteristics (e.g., political orientation, religion, etc.). Financial threats depend on the possibility of losing an important customer.

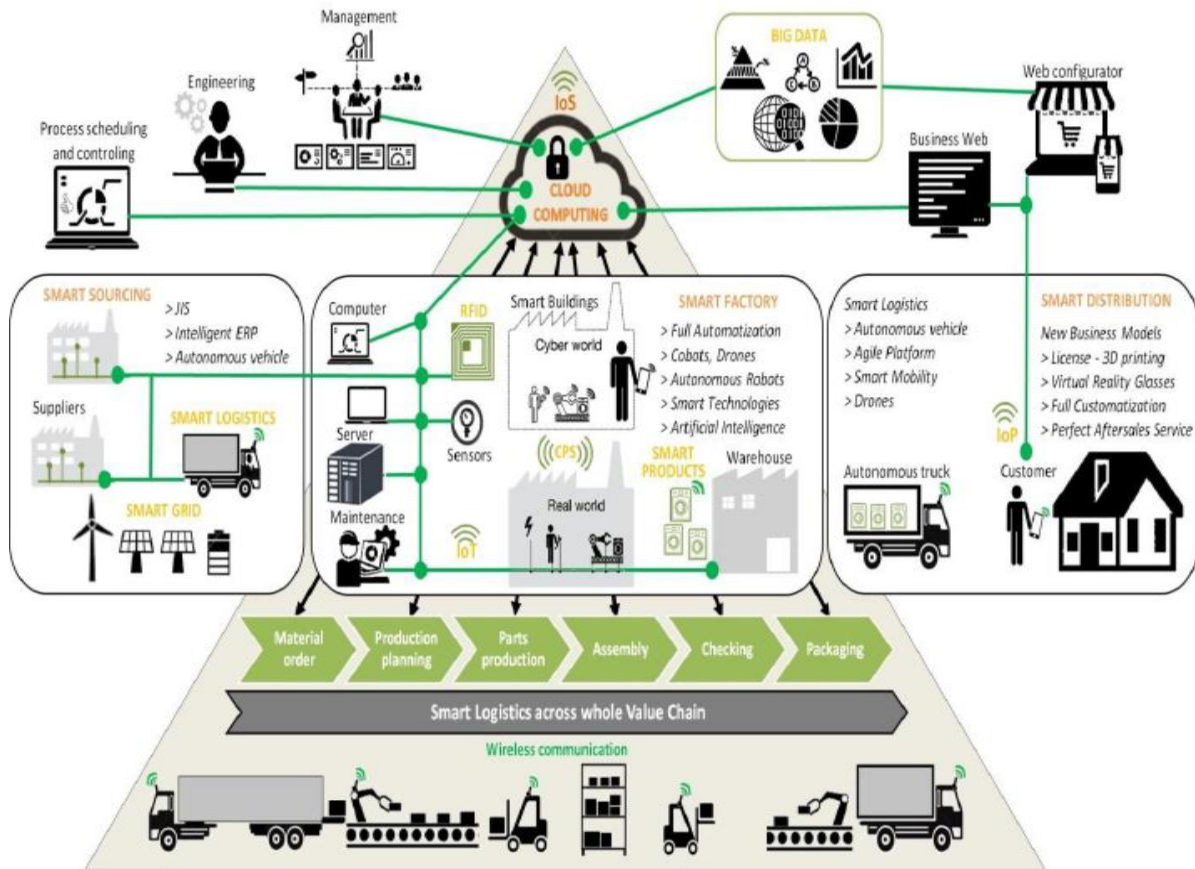


Fig. 1 Example of Stage 5 of digitalization in the enterprise [3]

It cannot be assumed that there are fewer risks in a company with a lower level of digitalization, but the nature of the risks is changing and so is the way they are managed. The implementation of the different phases of digitalization will improve and humanize the work in the production lines. Simple manual tasks will disappear. Employees will be coordinators who ensure smooth production and will only intervene when a machine calls them to action. It can be concluded that areas where Industry 4.0 elements are not implemented will be more Safety-oriented, while areas where Industry 4.0 elements are more actively used will be more Security-oriented.

5. Change of perception of the need for digitalization in enterprises

Before the pandemic, a survey [4] was conducted in enterprises of the Slovak Republic, one part of which was devoted to the analysis of the current state of digitalization in relation to safety and security. This part consisted of 24 questions. The results came out interestingly, namely that 34% of the respondents were aware of the need to implement digitalization in the enterprise but considered it to be little known in the enterprise. 32% of the respondents perceived that digitalization in relation to safety and security is only marginally reflected in the management of the enterprise. The estimate of the degree of digitalization in 18.9% of enterprises came out to be around 51%-60%, Fig. 3.

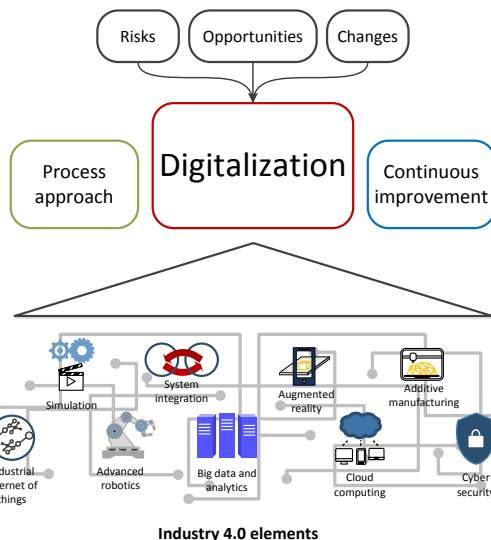


Fig. 2 Risks in the context of digitalization

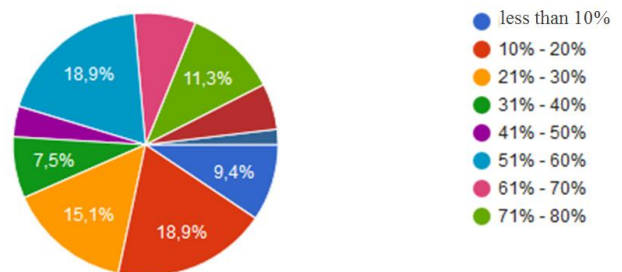


Fig. 3 Perception of the need for digitalization in enterprises before the pandemic

The global spread of COVID-19 infection and the deployment of strict precautionary and safety measures has led in many cases to the paralysis of production facilities. Thanks to digitalization, some enterprises have had sufficiently flexible and agile processes to be able to implement and continue their business activities without downtime, disruption, and unnecessary financial costs.

The crisis caused by the pandemic has significantly changed the previous plans in many companies. If digitalization has not been a priority so far, enterprises will have to rethink their strategic plans if they want to continue operating after the crisis. The same is true for automation, where, as a result of the current crisis, a similar scenario is expected in this area as for digitalization [1].

It is the current pandemic that has highlighted the gaps and reserves in business processes at different levels that could provide digital transformation solutions. In this case, it is a matter of trivial signing of legally binding documents by statutory officers remotely up to more complex solutions for dynamic management of production lines or supply.

This situation has revealed the need for digitalization for:

1. crisis management,
2. access to accurate, correct and up-to-date information.

The crisis has divided enterprises into two groups. The first group includes companies whose operations are currently shut down. These enterprises belong to the endangered group and their priorities will focus on the survival of the enterprise, consolidation after the crisis and rehabilitation of the enterprise. The crisis will help them to identify weaknesses and they will also need to focus on increasing the flexibility of processes so that the operation is able to respond to extreme market fluctuations, such as in the case of a pandemic. The second group includes companies that are managing their business activities during the crisis thanks to digitalization.

6. Conclusion

Evidence of the need for digitization and a change in perception is the existence of at least partial digitization in almost every company, at least in the form of a basic in-house digital system related to financial-administrative processes. Deploying new technologies, process optimization, continuous innovation and setting up new operating as well as business models will be a new strategic challenge for most companies.

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