

Perspective of smart business development

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Abstract: - This article points out the importance of digital transformation of enterprises and the economy as a whole. Technological-driven changes affect all industries and digital transformation is becoming a necessity for achieving global competitiveness. In the EU it is not sufficiently accepted that today's market requires digital business transformation and adaptation to the digital age. The aim of this article is to systematically present and explain the concept of a smart enterprise, analyze the characteristics, significance and benefits of smart enterprises, describe, analyze and show the results of the implementation of measures, strategies and programs adopted by the European Union to stimulate digital transformation and smart business development and digital economy.

Key-Words: - digitization, industry 4.0, smart enterprise, strategy

1 Introduction

In the new smart digital economy, many ways of doing business quickly become obsolete, and changes driven by the development of technology and society take place in all sectors. A smart enterprise has become the foundation for stimulating growth and transforming the business environment. „Digital economy already contributes up to 8% of GDP in the G-20 countries, encouraging growth and job creation“ [30]. Studies have shown that small and medium-sized companies in Europe are growing 2 or 3 times faster when they adopt new digital technologies, or when they are transformed into smart enterprises. Digital leaders who successfully carry out transformation into smart enterprises surpass their competitors. New technology

solutions, such as mobile and social solutions, data analysis and digitalization of production offer new opportunities for improvement in smart enterprises and in the economy of knowledge. However, this huge potential is insufficiently exploited, and many companies have not been digitally transformed into a smart company, and very few of them are exploiting the full potential of digital technologies, such as: mobile, social networking, cloud computing and data analytics. The government and business leaders across Europe should make it a priority to encourage and support small and medium-sized businesses in using the latest digital technology and gain additional economic benefits.

This paper is divided into several chapters. After the introduction follows the chapter on smart

enterprises, where all the major features and trends of smart enterprises are given. Chapter 3, Incentive to the development of smart enterprises, speaks of strategies that encourage and whose realization creates prerequisites for smart business development. Finally, Chapter 4 gives the main emphasis of incentives and perspectives for the development of smart enterprises.

2 Defining a smart enterprise

A smart enterprise by some authors encompasses the entire smart, ie digital economy and industry 4.0 that is needed for the existence of a smart enterprise, while some authors limit the definition solely on the technology and new business concepts which smart enterprises adopt through its transformation.

The concepts that are always connected with a smart enterprise are: industry 4.0 and digital transformation.

„Industry 4.0 is a strategic approach to linking systems based on Internet technology to establish communication between machines, people, products and business systems“ [24]. The main goal is to create smart enterprises through digitizing business and production processes. This can increase the quality, reduce production, services and administration costs, and increase the efficiency of production, service, administration and increase business success.

Digital transformation is, in the simplest terms, the process of organizational change by using digital technologies to improve the performance, reduce overall business costs, and increase production efficiency and productivity.

According to Joe Lonsdale [26], smart enterprise is a new kind of computing enterprise that uses huge amounts of data to empower knowledge workers who create new value by applying knowledge and analysis of data relevant to their tasks in solving the most complex issues. In this way, smart enterprises can reduce inefficiency, completely remove "scratch" from production, enhance collaboration at a higher level through ICT integration, but also handle a large amount of collected and unused data in a new sense.

Smart entrepreneurship is a concept that involves changing the way organizations are using technology and thinking about technology - from support role to strategic role in business [17].

A smart enterprise uses technology to differentiate and achieve a competitive edge. Technology is considered to be the base tool that can enable and improve all business activities, and not just as a support function.

Smart business intelligence platforms, vertically focused on their environment, integrate heterogeneous large data sets, structure data in a useful way, and help make better decisions. They often have a network effect which is generated by sharing data between different industry stakeholders, where the value of the platform is growing exponentially with the number of users [13]. Data sharing (network performance) motivates companies, which are part of the verticals, to adopt technologies that enable them to create and use a data platform, whose value grows with the number of industry participants.

One of the key features of a smart business is connecting each other at different levels to optimize business processes. A smart company uses a heterogeneous information system, stores and manages huge amounts of structured and unstructured digital information that interconnects and thus acts in an agile environment.

As mentioned above, a smart enterprise is a broad term and, to make it even more understandable, it is necessary to define the environment in which it operates and the technology that binds it. Some of the notions (except for the aforementioned) are: big data, cloud computing, Internet of things, artificial intelligence and real-time decision.

Big Data implies a large amount of structured, semi-structured and unstructured data collected from different sources and for various purposes. Analyzing and structuring such data is a challenge for today's industry as well as the global economy, since analysis of such data creates a competitive edge and generates new products and services [1]. It is crucial to collect and select relevant information in time to keep the enterprise competitive on the market [23]. The greatest value that managers and employees can bring to the strategic decision-making process is not their current knowledge of the issue, but the ability to look for data and solutions and to make effective use of feedback [21].

Cloud Computing is a software model that allows access to shared resources, enables businesses to store and process data at a minimal cost of control, often over the Internet. It is based on sharing resources to achieve coherence and economy of scale.

Internet of Things (IoT) is connecting people, things, and devices over the Internet. From the industrial production position it includes linking IT systems to manufacturing processes, internal and external facilities, networking between suppliers and customers, Machine to Machine, M2M and employee communication [29].

Artificial Intelligence is a part of computer science that develops the ability of a computer to perform tasks that require some form of intelligence, that is, to make them be able to deal with new opportunities, to make new concepts, to make conclusions, to understand the natural language, recognize products, etc. [31].

The growth in business dynamics has influenced the need for faster business decision-making, which has induced the emergence of a new concept within business intelligence. It is predicated in the mindset of business intelligence decision-making in real-time. As a new concept that has just emerged from the theoretical framework, the concept of real-time decision-making clears the differences between rational strategic and operational decision-making, enabling the operating decision-making level to use platforms and tools that have only recently been available for strategic decision-making [2].

In order for a successful transformation to a smart enterprise, the technology itself is not enough, the enterprise needs to re-examine every aspect of their business. Enterprises need to develop new business models, review existing operating models, refresh indicators that measure their business success, and improve the methods of finding and developing digital talents.

Smart enterprise is moving away from the traditional way of thinking. It understands that the only constant in the environment is change, and uses technology to respond to changes in the business environment. To a smart enterprise, technology has a strategic role, not just the role of support. Using new technologies smart enterprises increase efficiency and productivity, stores, processes and interconnects large sets of data that enable real-time decision making. A smart enterprise invests in the knowledge of workers, finds the best digital talents because the combination of technology and knowledge society means sustainable growth and development and competitive advantage.

2.1 Trends in smart business development

The beginning of all industrial revolutions took place in the industry, causing huge social changes. Industry development is shown in Figure 1[15].

The first three industrial revolutions are the result of the introduction of mechanization, electricity and information technology.

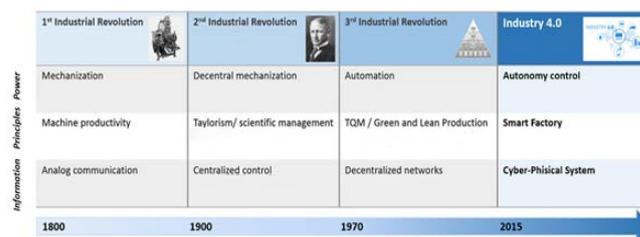


Figure 1 Industrial Rvolutions through the history

The introduction of the Internet into production started the fourth industrial revolution, based on self-management, the smart factory model, and the cybernetic-physical system.

In the current industrial revolution, the industry did not directly begin the transformation. The main driving force is considered to be the invention of social networks and intelligent devices used by workers of manufacturing companies. The development of this relationship promotes the development of the manufacturing sector [18].

An important element in introducing networked, smart factories is energy savings. It has been shown that applying the concept of Industry 4.0 can achieve great savings in energy consumption, which is of crucial importance for competitiveness [12].

Also, one of the key issues in today's Internet world is security. Hackers inside and outside companies have new opportunities to attack, undermine, and break the growing smart enterprises. With the increasing risks of corporate spying and digital theft, security is becoming more and more important in organizations which are transforming into a smart enterprise [14].

Smart digital companies can now access, store, aggregate, and analyze a large amount of diverse data to inform critical projects. Examples of this digital data are: data from sensor networks; social networking data, government transactions data, healthcare data, etc.

“Over time, five major trends have dominated Silicon Valley: Electronic Tools, Semiconductor, Enterprise, Telecom, and Consumer. A sixth trend has emerged - Smart Enterprise”[26]. The smart enterprise wave will disrupt every sector of the global economy and improve productivity within those sectors, because it change decision-making processes [26]. The more complex decision-making processes are the result of the enormous increase in digital data, whose doubling time is shrinking. This increase has brought a corresponding increase in data complexity, formats, and silos that require sophisticated technology platforms to help knowledge workers process and leverage the information effectively.

Firms like SAP and Oracle led the first enterprise wave by streamlining back-office processes to make companies more efficient and successful. Enterprise software helped push paper faster and speed up routine business tasks and brought basic automation to linear processes, such as payroll, accounting, supply chain and inventory management [26].

Telecom companies have created the prerequisites for generally accepted and intensive communication and networking of all the participants of the society, and the simple exchange of multimedia content. Further development of technology and network connectivity enabled users to interactively communicate via social networks. All this leads to the generation of huge amounts of digital data / information and represents a step towards digital transformation to a smart enterprise.

A smart enterprise, as a technological trend that is an upgraded version of the previous ones, is aiming at increasing flexibility, improving quality and improving production, and thus increasing productivity.

Transformation into a smart enterprise is not easy. The existing technological infrastructure is not appropriate for the new information challenges, which makes the process very difficult, so there are numerous mistakes and problems in adding new functionalities. Implementations are long-lasting and complex. In the process of transforming into a smart enterprise, companies review and change the old technology infrastructure. Engineers address the technological issues involved in the integration of incompatible data (database, tables, spreadsheets, machine generated data, semistructured and unstructured data, etc.) into conceptual structures that knowledge workers can intuitively access and manipulate.

3 Incentives for the development of smart enterprises

Digitalization of the industry and the emergence of smart enterprises deeply penetrates into all parts of industry and society. It increases competitiveness through innovative and sustainable production of goods and services, promotes economic growth, creates jobs and achieves prosperity. However, digitization of the industry is also a challenge that requires active participation of social partners and public bodies in the implementation of digital transition and is a constant task that will forever impinge on businesses, trade unions and policy makers. EU members are committed to achieving a strategy for investing more in R & D, innovation,

knowledge and achievement of regional development by concentrating resources and strengthening comparative advantages within the country.

This requires significant additional investment in digital skills and infrastructure at EU, member states and private sector level. The completion of the EU's single digital market requires a clear and stable legal environment to encourage innovation, address the problem of market fragmentation and enable all stakeholders to exploit new market dynamics on fair and balanced terms. This will provide a fundamental climate of trust that is key to the trust of the company and the consumer [10].

Surely, the most important strategy for support of smart business development is the Europe 2020 strategy, but there are also the Smart specialization strategy as well as DESI index which is used as a tool of measurement of achievement of goals.

3.1 Europe 2020 Strategy

Like most regions around the world, Europe is going through a period of transformation. The world economic crisis erased the year of economic and social progress and exposed the structural weaknesses of its economy. In 2010 the European Union and the member states launched a sustainable growth strategy for the next decade: Europe 2020 strategy. It is devoted to the short-term challenges associated with the crisis, but also the need for structural reforms by stimulating growth measures needed for the European economy to prepare for the future. The EU has set five ambitious targets for employment, innovation, education, social inclusion and climate / energy, to be achieved by 2020 [7]:

- „1. Increase the employment rate in the age group between 20 and 65 years to 75%.
2. Increase R & D investment to 3% of GDP.
3. Reduce greenhouse gases by 20% compared to 1990 levels; increase the share of energy from renewable sources to 20%; increase energy efficiency by 20%.
4. Reduce the rate of early school leaving to less than 10% and increase the share of highly educated people in the age groups of 30 to 34 years to over 40%.
5. 20 million less people should be at risk of poverty.” [8].

Each Member State has set its national targets for each of these areas, and the EU has agreed on a number of concrete measures at EU and individual levels. They also identified the most important areas of action that are considered to be the new growth drivers and job creators. These areas are represented through seven "leading initiatives"; Innovation

Union, Youth on the move, A digital agenda for Europe, Resource efficient Europe, An industrial policy for the globalisation era, An agenda for new skills and jobs, European Platform against Poverty. [7]

The seven initiatives mentioned above can be divided into three basic priorities - smart, sustainable and inclusive growth, achieved through their composition in individual national and regional programs and goals.

Smart growth is based on knowledge and innovation, and requires improved "quality of education, research, promoting innovation and knowledge transfer across the EU, full use of ICT and transfer of innovative ideas for growth and employment-generating goods and services. It is particularly important to stimulate absolute growth in investment in research and development, both by the state and private investors. Smart growth is achieved through three initiatives: the Innovation union, the Digital Agenda for Europe Initiative and the "Youth on the move" initiative. [27]

Productivity is the key driver of competitiveness, investment and growth. The link between innovation and productivity has been established through the impact of investment in research and development on productivity.[25] Europe faces a gap in productivity compared to major competitors. The annual rate of productivity per employee in Europe is lower than the US, and even lower than in China and South Korea. Such a gap creates a loss of investment interest and market share in global trade.[22] The shortage of investment over the past few years, with a drop of about 430 billion euros since its peak in 2007, will likely continue to hamper the creation of new jobs and negatively affect the ability of the EU to remain competitive in the long run.[3] The Innovation Union Initiative - Investing in R & D and innovation policy must act to counter social challenges, ie they must act in accordance with climate change, energy efficiency, lack of resources, human health and negative demographic changes. Among other measures of European and national programs designed in the 'Innovation Union', the reformation of national and regional R&D and innovation systems is also encouraged to stimulate excellence and the implementation of a smart specialization strategy.[9] Youth on the move, as set of initiatives for education and employment of young people, is part of the Europe 2020 strategy for smart, sustainable and inclusive growth. Young people on the move seeks to improve the education and employability of young people, reduce youth unemployment in line with the EU's broader goal of achieving 75% of the

employment rate for a working-age population (20-64 years). This increases the importance of education and training of young people, encouraging them to take full advantage of the EU's benefits for studying or training abroad; encouraging EU countries to take measures that simplify transition from education to work. The EU's objective is to enhance the quality and competitiveness of higher education systems by standardizing quality, promoting informal learning, by increasing investment in the education system and by similar measures that would result in youth unemployment being reduced. The initiative encourages EU mobility with Erasmus and Marie Curie. [27]

The Digital Single Market Strategy aims to open digital opportunities for people and businesses and to improve Europe's position as a world leader in the digital economy. A digitally unique market is one that ensures the free movement of people, services and capital, and where individuals and businesses can easily access and implement online activities in fair competition and high levels of consumer and personal information regardless of their nationality or place of residence. [7]

The Strategy of the Single Digital Market was adopted on May 6, 2015 and includes 16 concrete initiatives.[6] A unique digital market can create opportunities for new startups and enable existing companies to access more than 500 million people. Completing the digital single market could annually contribute EUR 415 billion to the European economy, create jobs and transform public services. Incorporating a unique digital market provides opportunities for people with digital skills. Enhanced use of digital technologies can improve access to information and improve employment opportunities. It can promote a modern open government. The strategy of a single digital market is based on three pillars: access, environment, and economy and society.[6] Access means better access to digital goods and services to consumers and businesses across Europe. The environment implies creating real and equitable market conditions for digital networks and innovative services. Economy and society maximize the potential of e-growth of digital economy, its goal is to speed up the introduction of super-fast Internet, to generate economic and social benefits from the single digital market for the population and the overall economy, to encourage and promote the development of online services. The initiative implies the development of e-infrastructure and global networking of researchers. [27]

The modernization of existing European Electronic Communications Code offers a more attractive regulatory environment that will boost investment in top quality infrastructure across the EU. By the end of 2017, the European Commission will also update the European guidelines that will assist national telecommunications bodies in deciding when to intervene in markets. The WiFi4EU Initiative will help local authorities establish free Wi-Fi connections for everyone in EU cities and villages by 2020. On March 23, 2017, the EU ministers signed the declaration on financial support for the next generation of Computer and Data Infrastructures - the industrial project of the European Airbus dimension of the 1990s and Galileo in 2000. Thanks to € 6.7bn of public and private investments, the European Open Science Cloud will offer a virtual storage to 1.7 million Europe's researchers and 70 million scientific experts by 2020, to share and reuse data. [7]

Consumers will be more convinced of the benefits of on-line trade and businesses expansion will be cheaper and easier thanks to the modernized EU contract rules. The proposed regulation on geo-blocking will ensure that consumers no longer face unjustified obstacles such as redirecting to a particular country's website or requiring payment by debit or credit card from a particular country. [5]

Sustainable growth implies the development of an efficient economy that is both competitive and sustainable. The goal is to achieve sustainability by using 'green' technologies, thereby reducing pollution, increasing resource efficiency and maintaining a high standard of living. The development of new "green" technologies would increase competitiveness, but at the same time increase the use of renewable energy sources, they also contribute to greater ecological safety of European society. The European Commission, in order to help enterprises in their efforts to reduce their impact on the environment, developed Eco-Management and Audit Schemes. [27]

There are two initiatives for sustainable growth achievement: The Initiative "New Skills and Employment Program" aims to create a modern market by promoting self-employment, flexible work, labor mobility and lifelong learning. The "European Platform Against Poverty" initiative seeks to create social and economic cohesion by promoting common and individual responsibility in combating social exclusion by providing basic rights to the poor through the promotion of the social and pension system.[27] Inclusive growth implies raising the level of employment in Europe.

3.2. Smart specialization strategy

It has been confirmed that smart, sustainable, inclusive, and long-term growth can be boosted by investing in research and development, innovation and people. The European Union has launched the initiative of developing a smart specialization strategy as a new approach to economic development based on targeted support for research and development activities and innovations. The smart specialization strategy is an overall assessment of public sector governance capacities, and key fundamentals for innovation - research capacities and human capital. [19]

The smart specialization strategy links all three of the Europe 2020 priorities, smart, sustainable and inclusive growth. It achieves smart growth through the transformation of the region into knowledge intensive economies, it promotes creativity and innovation. It steers the development of innovation and investment towards addressing social challenges through efficient use of resources and low-carbon production, thus stimulating sustainable growth. Smart specialization also contributes to the growth of the region by strengthening territorial cohesion, managing structural changes, creating new economic opportunities, investing in skills development, new jobs and social innovations. [11]

The current strategies for fostering innovation have had several weaknesses:

- lack of international and inter-regional perspectives,
- were not in line with the industrial and regional structure,
- lack of regional resources exploration,
- excessive role of the state in determining priorities,
- copying ideas from other regions without taking local potentials into account. [11]

The smart specialization strategy preparation requires an integrated and territorial approach with the aim of creating conditions for development as a whole, respecting regional differences. The smart specialization strategy will stimulate efficient use of public funds for research, it will stimulate technological and innovation development aiming at modernizing existing industries by stimulating structural changes and directing growth based on the increased innovation capability and research excellence. [19]

3.3. The Digital Economy and Society Index (DESI)

Digital economy has become a key challenge for development of industry, science, society and public policy. In the effort to foster the development of the

digital economy, one of the priorities of the European Commission is to establish a connected Digital Single Market, as well as the adoption of common European regulations on data protection, telecommunications and copyright regulations, the development of advanced broadband infrastructure and the simplification of consumer internet purchase regulations. This will enable better functioning of cross-border provision of services, cross-border online trade, and definition of technical standards for the development of innovative technologies and solutions. All of this suggests creating conditions for a digital economy transformation based on ITC, knowledge, creativity and innovation. National economies need a strategic framework for the development of the digital economy, strategic documents aligned with the goals of the Europe 2020 strategy and the Digital Plan for Europe. The ICT sector is an important driver of economic development, a horizontal force that is the key infrastructure for linking and strengthening all sectors of the economy by strengthening its market position in the long term.

The success of implementing this strategy at national level and the progress of Member States in the numerous areas of digitization of the economy and society as a whole is measured by the European Commission through The Digital Economy and Society Index (DESI). [16]

DESI, an indicator of economic and social digitalisation, is composed of a package of relevant indicators structured in five dimensions:

„1. connectivity (how widespread, fast and available is broadband connection),

2. human capital,

3. use of Internet (the most common user online activities, from news search to online shopping),

4. Integration of digital technology (on which level of development are the key digital technologies e-invoices, cloud services and online trade),

5. digital public services (e-government and e-health).“ [20]

DESI overall index is usually calculated as the weighted average of the 5 DESI dimensions with the weights selected by the user. [16]

4 Conclusion

In the new digital age, a smart company has become the foundation for stimulating economic growth and development and creating new jobs. Smart companies grow two to three times faster and surpass competitors who are not capable of responding to changes and market demands. New technological and technical achievements, Industry 4.0, digital transformation, cloud computing, IoT,

big data, artificial intelligence, real-time decision-making offer a whole range of opportunities for upgrading companies into a smart enterprise as it's the only way to survive in the knowledge society. Everyone must take part in the development of smart enterprises, from entrepreneurs, consumers, academic community, and even to the state itself. All listed should create a digital transformation environment together, which is the basic prerequisite for smart business development.

State measures, programs and strategies which support the creation of a digital environment are the fundamental incentives for digital transformation and the development of smart enterprises and societies. Digital transformation affects all branches of the economy, and thus the success of every business, which all the factors in society should be aware of. Digital technologies affect business models, goods, services and open new markets, change the way business operates, and without adopting technological innovations, companies can not survive.

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