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SERVICES IN THE DIGITAL AGE - REVIEW OF SELECTED SERVICE AREAS

INTRODUCTION

The world economy is at crossroads and in many aspects the future is shrouded in uncertainty. But one trend is certain, lasting and definitely gaining in importance - the digital transformation, i.e. the dynamically growing use of data and software in production, distribution and sales processes.

Digitalization is connected with the construction and exploitation of cyber-physical systems functioning with the use of digital technologies and information systems. It is an activity of a technical, economic and organisational nature that aims to introduce digital devices and systems into various areas of the economy. First of all, we are dealing here with access to high-speed Internet, the development of online e-services and resources, digital competences and citizens' skills. The concept of digitalization is therefore understood as action to increase access to the Internet and its resources for citizens and to electronise state administration. Every business entity is a participant in the digital economy, if only because of the need to cooperate with the administration, tax authorities, banks or insurance institutions that develop the sphere of digital services. First of all, digitalization is a two-track process, which on one hand concerns the implementation of state-of-the-art technologies, and on the other hand - catching up by Polish companies in basic digital functions, such as e-commerce. Implementation of digital solutions usually requires fundamental changes in the company's work culture. This is a process that concerns investments in human capital as much as investments in technologies. An important element of this process is to move away from thinking about digitalization as a gradual change and the cost to thinking about digitalization as a step change and investment.

Digitalization of the economy and society is one of the most dynamic changes of our times, which opens new opportunities in creating business models, and at the same time brings with itself uncertainty and various types of threats related, among others, to the social effects of automation of manufacturing processes or broadly understood security.

Digitalization as a continuous process of convergence of the real and virtual world is becoming the main engine of innovation and change in most sectors of the economy. The key

P. Cyplik et al. (eds.), *Contemporary challenges in supply chains, Vol. 2*,
https://doi.org/10.17270/B.M.978-83-66017-89-4.13

factors driving the development of the digital economy are today: [Pieriegud 2016] Internet of Things and Internet of Everything (IoE),

- hyperconnectivity,
- cloud computing applications and services,
- big data Analytics (BDA) and Big-Data-as-a-Service (BDaaS),
- automation and robotisation, multi-channel and omni-channel distribution models of products and services.

In the era of digitalisation, modern consumers are increasingly demanding modern, innovative and high quality services, focusing on technologies associated with the Internet, smartphones and iPads, but their purchasing decisions more and more often include comfort, safety and free time [Bombol, Dąbrowska, 2003].

Computerisation, IT, digitalisation

Among many definitions or terms concerning computerisation, the following seems to be the most representative. In general, computerisation as a phenomenon is considered to precede IT and involves the introduction of computers into businesses and offices, thereby replacing manual forms with electronic forms, paper archives with databases and the introduction of e-mail or instant messaging as a communication system. [Wikipedia 2019].

IT is a concept that is often mistakenly associated with computerization. Computerization is the process of introducing computers to specific places, such as offices, schools, as well as elimination of paper databases and introduction of computer databases with dedicated IT systems. This allows you to store, retrieve and classify data. IT is the process of transforming the economy and society into an information society based on information. IT development assumes increasing the number of IT systems and financial resources allocated to projects related to IT technologies. The industrial economy is being transformed into an economy in which information and knowledge are essential. Both the process of IT and computerization are the basis for the development of societies under modern forms of regulation (Abramowicz 2013).

Therefore, the definition of basic concepts should be completed by the term used for the purpose of this Article, i.e. digitalization. "What is digitalization?" What really distinguishes it from the aforementioned computerization or IT? Digitalization is a strategy that aims to use the best IT solutions to optimally manage the potential of the organization's digital resources, because digitalization is perceived as one of the stages of the organization's development and it

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is definitely much more complex than moving selected elements of the company to the digital world, e.g. through the introduction of digital circulation of documents and mail. As M. Rojek writes digitalization is treated as an evolution in the computerization of the enterprise, which binds all its parts into one dynamic mechanism. [Rojek 2016]

It seems that the most representative definition will be the term contained in the Oxford English Dictionary, which says that digitalization is the adaptation and growth of the use of digital or computer technologies by organizations, sectors of the economy, countries, etc. "Digitalisation is the process of transforming a company's assets into new sources of revenue, growth and other operational results that add value to a company by harnessing the opportunities offered by digital technology". In other words, digitalisation enables the development of new business models, triggering unique customer experiences, offering new products and services, and utilising company resources in a much more efficient way through new combinations of information, human capital and technological resources. [Accenture Digitization Index 2016, accenturedigital, https://www.accenture.com/tren/insight-accenture-digitization-index-report 2019].

Health services in digital conditions

In no other sector of the economy is there so much attention paid to the provision of services as in the case of so-called professional medical services. Due to their exceptional character, medical services are among the exceptional products on the market. Until recently, the specific feature of health care products was the required contact with the purchaser in the process of provision. [Holub - Iwan 2005]. As a result of the technical revolution, many medical services "moved" to the digital area.

Changes in the market of medical services reflect the directions of changes in the entire Polish economy, and these changes will occur quite quickly, stimulating customer preferences, and above all, technical progress and the development of technology and the digitalized economy.

All documents concerning e-Health strategy set out the main directions of development of digitalization in health care. The following elements are distinguished: (e-Health Strategy, Ministry of Health 2009)

- services based on relations between physicians and patients (e - medical consultations, electronic prescriptions, patient health check),

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- services aimed directly at patients (electronic health accounts, medical information and education portals, Internet pharmacies),
- services addressed directly to doctors (knowledge portals and training tools for doctors).

However, the following key objectives have been set for the development of e-Health: (e-Health Strategy, Ministry of Health 2009)

- facilitating citizens' access to health information,
- improve the efficiency of the health care system in terms of electronic document workflow,
- upgrading the information system to analyse the demand for health services, construction of IT solutions for health care in accordance with the guidelines of the European Commission.

The development of e-Health requires the fulfilment of many conditions, starting from conducting a clear state policy in the implementation of universally available medical services at a distance, through promotion of valuable health content on the Internet and improving health knowledge, to build human capital (acquiring new qualifications and skills by workers) in the health sector. e-Health services give the patient the possibility of wider access to information and will have a significant impact on increasing the effectiveness of health care institutions. [Dąbrowska 2013]

The electronic platform e-Health is a project whose aim is to digitize the Polish healthcare system. The modern system translates into improvement of the quality of medical services and facilitation of patients' access to healthcare. The most popular solutions, which have recently become a permanent element of the health care system, include the following services:

- Internet Patient Account (IKP),
- e – prescription,
- e - medical leave.

All this makes the fact that the implementation of e-Health services improves the flow of information, and for the patient it means better treatment, safety and more time spent by the medical staff on the patient, which results in wasting less time on unnecessary bureaucracy.

Digitalisation of education

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https://doi.org/10.17270/B.M.978-83-66017-89-4.13

The challenge for today's schools is to prepare for the critical and thoughtful use of online information and to develop digital competence as part of lifelong learning. These crucial competences in the 21st century include the skilful and critical use of information society technologies for professional, educational, entertainment and communication purposes.

A digital society requires new and innovative forms of teaching and learning that take into account multicultural understanding and cooperation. Learning methodologies based on self-exploration or project workusing e.g. the idea of gamification and games can enhance learning motivation and commitment to learning.

Digital education increases the effectiveness of educational processes, develops key social skills and competences of the future, supports individual creativity, and at the same time teaches cooperation in a group, responsibility and creative approach to one's own development. Technological tools help to actively support the learner in the search and creation processes. Moreover, digital education equalizes educational social disproportions and development opportunities for all those with special educational needs. It enables the learners to overcome geographical and material barriers. Relationship with technology acquaint us with the future reality of professional work. The wise use of technology allows for a conscious introduction of students into the future, supports motivation and provides access to modern scientific achievements. Appropriate use of technology supports everyone in creating social capital, builds reflection, and engages in social life. [Polish school in the era of digitization 2017].

Digitalization of education is the task of modern teaching, which should, among other things, prepare students for life and work. European documents identify key competences for lifelong learning. One of them is digital competence. They include the skilful and critical use of information society technologies for professional, educational, entertainment and communication purposes. This includes, but is not limited to, the use of computers and the Internet to acquire, store and create knowledge and the exchange of information. It is also about building and participating in cooperation and self-education networks. The challenge for contemporary schools is to prepare for critical and thoughtful use of information available online and to develop digital competences.[Kempka 2017].

The easiest elements that motivate to use IT solutions during classes are:

- multimediapresentations, multimedia whiteboards (I - tools),
- ready-made applications, films, interactive exercises, quizzes,
- multimedia materials included in the textbooks,

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- interest and involvement of students,
- e-textbooks, multibooks, ebooks,
- rich online resources,
- access to good quality equipment, fast internet,
- making it easier to work, creation of own resources, aid.

E - education offers new solutions addressed to a wide range of recipients belonging to the information society. We can safely say that "traditional" science is evolving towards e-education. E-education is the use of new, multimedia technologies and the Internet to improve the quality of education. As a new way of acquiring knowledge, it is becoming more and more popular, providing easy access to sources of knowledge. [Dąbrowska 2013]

Education through the Internet enables the transfer of various teaching content and communicating using the Global Computer Network Internet or networks such as intranets or extranets.

Among the e-learning activities, we should distinguish:

- self-education - total lack of contact between the participants and the instructors, who make the content available, e.g. language learning,
- asynchronous teaching - participants do not have to be in the same place and time in the educational process, e.g. discussion forum or e-mail,
- synchronous teaching - teaching takes place in a real world that enables the immediate flow of information, e.g. audio-, tele- and videoconferencing,
- blended learning - including virtual elements in the teaching mode. [Dąbrowska 2013]

Referring to the broadly understood digitalization in education, it is necessary to refer to two documents. One is "Strategies for the development of the information society in Poland until 2013", the other is "Proposed directions for the development of the information society in Poland until 2020", in which two important elements have been distinguished:

- development of a system of commonly available electronic services in various service areas,
- development of skills necessary for active and creative participation in the education system for the needs of the knowledge-based economy. [Dąbrowska 2013]

If we consider higher education and individual universities participating in the higher education system, there is no single common system that could digitise all educational entities

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with a single programme or system. Practically every university creates its own area of digitisation of its activities.

The main areas of activity of higher education institutions in the field of digitalisation are the following: [Kaczmarek 2016]

- learning process - this element contains several important aspects of the teachers' work to make it more effective. The aim of this process is to encourage thinking as well as to contribute to more transparent and higher standards of teaching,
- the process of studying - is the main element of activity in each university. The main role here is played by the system of studies, which is a set of targeted laws, regulations, rules, orders, conditions and procedures for student research,
- research processes - provide a complete picture and link to the other main areas of activity,
- development processes - describe the procedures required for new programmes, new courses and activities for the award of joint or double degrees,
- management and support processes - processes dealing with strategic and operational objectives. They do not contribute directly to the core business, but are essential for its proper functioning. They may be imposed by regulatory constraints and institutional requirements. They cover all faculties of higher education institutions and require close cooperation between departments.

The above processes in Polish academic centres most often involve computerisation or digitalisation of processes supporting teaching, covering the entire university as well as preparation of a course and access to materials, recruitment, as well as studying (with access to course schedules, grades achieved by students and student service).

Generally speaking, each of the systems used overcomes all the inconveniences associated with classic methods of managing didactic documentation, and at the same time creates completely new opportunities: [Kaczmarek 2016]

- efficient management of information on the conducted fields of study and specializations in a convenient and simple form,
- creating study schedules for subjects without restrictions on the kinds and types of classes or the number of courses and specialisations,
- transparent creation and management of syllabi of subjects,

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- ensuring that all interested parties have access to the information they need, at all times and in all places,
- presentation of the teaching offer in a tailored and comprehensive form,
- obtaining paper documents at any time,
- obtaining aggregate statements for analytical and control purposes,
- organising personalised access to all documents in the system.

Logistics services and digitalization

Logistics services can be included in the area which implements digitalization elements most strongly in its activities.

Digitalization and process automation are at the heart of the latest trends in this industry. This is the key to increasing the efficiency of a warehouse, distribution centre, transport, forwarding or production hall.

In the digital age, the flow of data and information now generates greater economic value than global trade in physical goods. Companies in the logistics sector still face a major challenge and need to respond to digital consumer demands, as online retailers do.

The dynamically growing needs for mass data exchange and processing (e.g. traffic, cargo, operations, means of transport, container/body condition and transport conditions - temperature, humidity) and their facilitating, sharing and re-usability have led to the development of digital data processing services in private or public cloud computing. Transport planning and monitoring needs have developed a number of digital service delivery models, including SaaS (Software as a Service), PaaS (Platform as a Service), IaaS (Infrastructure as a Service) and CaaS (Communication as a Service). Repeatability of the demand of many transport companies for similar types of services (truck & trace, delivery notification, electronic data exchange, etc.). - e.g. in sea and inland ports, logistics centres, air hubs) caused a dynamic development of digital service platforms in service oriented architecture (SOA) [Logistics in Poland - report 2017].

Speaking of new trends in digital logistics in economic space, the concept of digital logistics, its implementation characteristics and basic trends and directions of its development in enterprises should be defined.

The term digital logistics has emerged in the 21st century and is defined as a logistical activity based on digitalization. The separation of digital logistics as a separate domain of

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knowledge is fully justified by the fact that the issue of electronic data exchange between a large number of participants in logistics systems has always been a priority for the development of logistics processes.

The main features of digital logistics that determine its properties and dictate a specific approach to its implementation are: large number of participants, high level of penetration of the logistics service into all processes of transferring cargo, material, financial and information streams.

Consequently, the key parameters of digital logistics need to be defined, taking into account its characteristics as reflected in the economic space:

- on - line data collection and analysis,
- exchange of information,
- appearance of the so-called Big Data around logistics entities, which are analyzed and actively used,
- transparency of logistics processes as a norm or standard of cooperation,
- emergence of new technologies which make it possible to eliminate the fragmentation effect of owners of logistics facilities.

The following technologies in logistics should be considered as promising and thus innovative technologies in logistics:

- large databases (Big Data),
- Internet of things (Io),
- blockchain technology,
- e - SCM (Electronic Supply Chain Management),
- 3 D,
- drones for fast delivery,
- service clouds:
    - ✓ cloud software as a service (SaaS),
    - ✓ cloud platform as a service (PaaS),
    - ✓ cloud infrastructure as a Service (IaaS)

In general, customer focus and widespread use of information systems are the correct strategies and models for digitalisation in logistics and technology as a basic resource for digital transformation of real business processes. This will allow us to consider digitalisation projects to form the basis of innovative logistics.

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Banking services and digitalisation

E-Banking involves using services and performing banking transactions using the Internet. The bank's website enables online banking of various transactions.

Digitalisation of banking processes is both an opportunity and a challenge for the banking sector, but one should be cautious about the over-optimistic assessment of the digitalisation of banking.

The evolution of banking services towards e-banking stems from the benefits that consumers perceive. The main target of these services are young people, but more and more older people use e-banking, appreciating above all the convenience, time saving, the possibility of instant access to information and easy communication.

The changes that take place on the banking services market allow to separate the following banks: online banks (they do not have a real branch), traditional banks offering also online banks (most of the banks operating on the Polish market) and independent virtual branches (opening an account, opening a deposit, starting investments or consultations). The increase in the scope of e-banking services necessitates an increase in consumer competence in the field of mobile devices service and paying attention to the safety of these services. [Dąbrowska 2013]

Digitalization of activity translates into an increase in the number of bank customers and lower operating costs of the institution. Larger banks are doing better and are more innovative, but their smaller competitors are also introducing innovative products and services.

Dynamic changes taking place on the financial market as a result of the expansion of modern information and communication technologies result not only in the creation of new transaction channels, improvement of credit processes or more effective exchange of economic information. The most important consequence of the digital transformation is the change of the banking paradigm, the basis for which is the client of a financial institution, his needs and market experience.

Increasingly, the customer is guided by speed and comfort of service when choosing the services of a given bank. The banks' response to these requirements are services provided electronically. The driving force in the development of e-banking services is the Internet, which replaced the solutions applied so far.

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Internet banking is a combination of technological and organisational innovations, ensuring the expansion of traditional forms of financial services and creating completely new services in the world of cyberspace.

The challenge faced by banks is to reconcile the demand for fast and convenient digital banking services also in mobile channels with ensuring customer security. On one hand, customers expect progressive digitalisation and modern solutions ensuring easy and fast banking operations. On the other hand, digitalisation cannot be achieved by reducing the risk of cybercrime. Banks are also increasingly feeling the burden of regulating the financial industry, which this year has become one of the most important barriers to digitalisation for consumers.

The growing needs of customers who are interested in quick and easy access to services and products contribute to the continuous development and search for innovative solutions by banks. Process improvement, integration and automation will attract even more customers.

In the era of omnipresent digitalisation, almost everyone has their own bank account and access to a payment card, which allows them to carry out non-cash transactions in shops, petrol stations, catering or service outlets. Card payments have become so popular that many people do not even carry cash with them anymore.

This new digitalisation scenario creates both risks and opportunities for consumers:

- easier access to products, wider and better choice, price comparability through websites, more personalised and customised offers, lower transaction costs (time and money) and more security through new biometric authentication systems,
- new, useful products (e.g. community financing), but also the emergence of new products that are complex, unclear, difficult to understand and risky, e.g. short-term loans,
- possible problems with the provision of information/pre-contractual data through new sales channels, e.g. smart phones, due to their small screens,
- insufficient information on the risks associated with financial products,
- insufficient control/enforcement of new entrants in the financial services sector,
- in some cases, legal uncertainty as to which rules apply to new entrants,
- unregulated areas (e.g. automated consultancy),
- possible unjustified discrimination/exclusion related to the use of large data collections and lack of digital literacy,

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- cyber security.

Public services in digitalisation conditions

The needs expressed by society are unlimited in nature, which means that, at an increasing level of economic, social and cultural development, new, hitherto unknown and imperceptible types of needs are emerging. The increase in the size of needs is the result of technological, organisational, scientific, social, cultural, political, ideological and social progress. [Dylewski, Filipiak 2005]

Modern digital technologies are crucial for innovation and competitiveness of the economy. Their use in the public sector and economic trade is a litmus test of the level of social and economic development of countries.The process of dissemination and popularisation of digital technology and introduction of technological infrastructure, i.e. digitalization in Poland is based on cooperation between public institutions and private entities. The aim of the cooperation is to introduce new digital technologies and to prevent the so-called IT exclusion. Digitalization, therefore, does not only have purely economic goals, but also important social or even civilisation goals. An important element of digitalization is the expansion of the IT network, i.e. the newest and most efficient model of the Internet based on fibre-optic cables.

More and more public services are being digitalized. It is worth looking at some of them.

The Ministry of Digital Affairs is constantly developing an application called mObywatel. Its aim is to ensure that the administration services are as close as possible to the citizens, i.e. on the smartphone.

After the introduction of ID cards in phones, there was time for the registration certificate, vehicle card and third party insurance policy. This application includes the mPojazd service for all drivers. The mPojazd service enables quick passing of police checks when presenting documents. Thanks to the application, all data from the registration certificate, vehicle card and third party insurance will be stored on smartphones. The mPojazd service will remind drivers of the upcoming date of the required car inspection and the expiry of their third party insurance policy. The mobile version of documents will show the name of the insurance, the series and number of the policy, variant and duration. 30 days before the expiry of the contract, mPojazd will remind you of the need to conclude the contract. The situation with technical inspections is similar. The application has at its disposal data concerning the brand and car model, year of manufacture, license plate number, VIN number. One month before the end of the validity of

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the test, mPojazd will send a message about the need to carry out an inspection. [https://www.salon24.pl/k/326,cyfryzacja - 2019].

These services include the so-called e - receipts, which for customers mean the end of problems with lost or illegible purchase confirmations. Existing receipts, collected in one place, can be viewed on your computer or mobile phone. This will make it easier to control expenses and create a wide range of opportunities for fintech developers to develop financial management tools and applications.

e-PiTY, i.e. tax settlements in electronic form, has been in operation for a long time. The scope of services and official matters that can be handled through the Trusted Profile in the e-PUAP system is also expanding.

Administrations and services are expected to move increasingly towards digitalization. Pilot programmes are already underway on e.g. e - Documents, which should in future completely eliminate the need to carry ID cards or paper documents. In the office, a mobile phone is enough to authorize access to documents stored in the central register of administration.

It is believed that more and more activities will be performed on the Internet or electronically. It is said that we will be able to register children online, so before a woman leaves the hospital at birth, she will already be able to register a child with her partner using a machine installed in the hospital. [https://biznes.newseria.pl/news/przyspiesza-cyfryzacja-1979637602 - 2019]

In the area of upgrading public services, the role of innovation is growing, hence these services are treated as an important carrier of various solutions in the scope of new technologies, products or business models. Through this type of services it is possible to achieve effects important for the dynamics of innovation:

- the effect of breaking the barrier of absorption of new technologies. Public services, by their nature, are addressed to a relatively wide group of recipients. This effect is particularly visible in all the so-called " e-fields". These are, for example, such areas using the electronic form of services as: administration (e-administration), banking (e-banking), energy sector (energy e-media) or info kiosks,
- the effect of accelerating technological change. The public sector, by financing a large part of public services, influences their quality, purchasing or designing infrastructure,

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using the latest technological solutions. Such effects are particularly visible in: health care, public transport, energy, environmental protection or digitalisation of public space,

- the effect of awareness and satisfaction of using the latest organizational, technological and product solutions. What is important here is an element of awareness of satisfaction of using new solutions in areas where the customer does not have to know how to use these technologies, but knows how to use them - in a way they serve him/her. This concerns, for example: modern methods of diagnostics, treatment and prophylaxis of health, renewable energy sources,
- effect of activation of the public services client. The introduction of innovative methods of providing public services, such as digital technological systems of service control (energy services, environmental protection, public security, mobile payments), leads to a change in social behaviour. In such case, one can talk about shaping the prosumer's attitude of public service users,
- economic effect resulting from the ability to manage demand. The passivity of consumer and investor behaviour in the market is one of the most important factors in managing demand on a large scale. In many areas of public services, there is a significant increase in the cost of acquiring resources and products, including electricity, gas, heat, water and unique medical equipment. Introduced process and product innovations enable the introduction of the so-called e-markets and smart grids for the distribution of energy utilities, which will enable the recipient of services to optimize the costs of supply.

The last two effects are related to the issue of smart markets. These are two areas. The first is to shape demand on behalf of the customer. Efficiency of demand management is connected with the necessity of rational use of limited resources (e.g. natural resources in power engineering and transport) and the implementation of the principles of sustainable development economy. The reward for such trust is to stabilize or even lower the bill for the product paid for. It results from the acceptance of consumption of a given product in such a quantity and at such a time as the supplier offers the consumer. The second important area is the sphere of exchange of value that takes place in the customer-supplier relationship. In such relations, a new type of actor on the market is shaped: the recipient of value and at the same time the donor of value. Therefore, the customer is expected to have an impact on the improvement of the value of the product offered to him. At the current level of market

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development, the effectiveness of demand management and value exchange depends to a large extent on the construction of appropriate distribution networks using ICT technologies to such an extent that they effectively optimize the customer's deliveries in real time and ensure two-way communication with the delivery systems. [Brzóska 2011]

SUMMARY

Digitalization has become a common activity, especially in the area of services, but also in all aspects of daily life and business. It affects consumer expectations and behaviour, fundamentally changes market competition rules and leads to new economic models.

Infrastructure sectors, which remain to a large extent the public domain, play a special role in the digitalization processes. On one hand, these sectors, like other areas of the socio-economic system, are subject to mutual convergence processes. On the other hand, the development of these sectors, first of all of a qualitative nature, enables the emergence of new products and services both within infrastructural sectors and in other sectors of the economy. Digitalization is one of the ways to ensure the reliability and safety of network infrastructure (telecommunications, energy, transport, etc.), as well as its effective management and maintenance.

At present, digitalization cannot be associated only with technological novelties that are implemented in enterprises. For today's businesses, digitalization means responding to a changing environment.

For years, we have been witnessing the transformation of human communication and related technological development. It is hard to imagine a world without smartphones, communicators, e-mails or the Internet. Functioning in a global network has effectively transferred the relationships of people and businesses to the virtual world. We already use e-banking, social networking platforms, online shopping, etc. on a daily basis. Before our very eyes, the global economy is turning into a digital economy. New technologies, IT or telecommunications are no longer independent market segments, creating a system of interconnected vessels. Nowadays, digitalisation in its broadest sense is an element that links all areas of the economy, professional activity and private life.

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