

digital technologies are transforming the relations between economic actors in energy, construction, banking, transportation, retail trade, education, healthcare, the media and security.

Information and communication technologies today play a key role in modern society's development. Today, people around the world rely on mobile communication, internet access and social media for interactions with each other, sharing information and obtaining new knowledge and services, while governments and businesses increasingly prefer the internet for disseminating information, delivering services, communications, marketing and doing business in general. They have become an essential tool in the daily lives of citizens, increasing the importance of these technologies in a rapid trend over time (*Ministry of Information Society and Administration, 2011*). Every company or institution communicates with its environment which consists of users and customers, prospective buyers, suppliers, state, competition and more. For the survival of the organization, the most important thing is the communication that makes it with users or customers. The competitiveness and efficiency of companies and institutions increasingly depend on the capabilities of electronic programs and electronic communications. Information Technology (IT) has been considered as one of the most important components in the current business environment, offering opportunities for companies that successfully take advantage of its benefits (*Albertin, & De Moura, 2004*).

Effective communication is one of the key elements of any business's success. In the area of data exchange broadband technology has led to a significant improvement. The term broadband itself is used to describe high-speed Internet connections, that is, those that allow sites to open without much waiting, and emails to be sent and received quickly, with the possibility of large amounts of data being sent in addition to email. Private and public sector employees can communicate via email which directly reduces the cost of telephone and postal services.

The functioning of each element inside and outside the organization is conditioned by the nature and the system of communication. Communications are an essential tool for directing and controlling the work as well as the actions of people, individuals, and groups in the organization.

In this way, companies realize significant savings in operating costs, perform their tasks more efficiently, and become more competitive in the market. Participants in the business operation are governed by the general rules, but the business technology changes. Computers are used

for easy and smooth realization of growing number of business transactions; they replaced paper, pens, and stamp. The one who wants to be successful at the local level must also meet the criteria of global competitiveness because the new knowledge-based economy does not know the geographical barriers or the boundary (*European Commission, 2003*).

Electronic communication involves doing business processes with the usage of electronic technology. On-line communication means usage of various communication technologies to pass and receive information online (*Bodo, 2003*). Digital technology facilitates the combined use of information and communication technologies allowing the sending of large amounts of information over long distances in a short period of time. The development of the Information Society should be based on partnerships between government, civil society, the private sector, operators, local governments and the other stakeholders. Sustainable economic development is a benefit of the development of the Information and Technology Society, but at the same time, it is the driver of that process (*Ministry of Transport and Communications, 2005*). It is also an important factor in the early stages when creating a critical mass of stakeholders dedicated to the development of the Information Society.

Due to limited natural resources and poor export competitiveness produced mainly in the labor-intensive branches of the economy, Republic of North Macedonia as one of its strategic commitments for its own rapid economic development, it has been clearly identified the power of human potential and the capital of knowledge to direct and use as one of its strongest support in fulfilling its purpose. This corresponds to the priority to accelerate economic growth while providing equity (in satisfying the needs and solutions to the challenges that people face, both in urban and rural areas, different ethnic communities and equality in the right of access information) and ultimately poverty reduction (*Ministry of Finance, 2019*).

Full access to electronic communications infrastructures and information technologies ensures balanced economic development throughout the country, i.e. polycentric development that contributes to good decentralization of local self-government units, building transparent and accountable local administrations, culminating in a gradual decline of the digital divide within the state. At the same time, this leads to the relativization of borders and increased cooperation and dialogue within the Euro-region (*Ministry of local self-government, 2015*).

The purpose of this paper is to show the economic and social benefits of the users of products and services in terms

of business efficiency through the concrete examples and evidence, as well as from the results obtained from the research conducted in the selected companies and institutions in the Republic of North Macedonia.

2. THE DIGITAL TECHNOLOGIES FOR BUSINESS EFFICIENCY AND EFFECTIVENESS

Information and communication technology (ICT) enables globalization, as the opportunity to promote local products globally, i.e. equal participation in the global networked economy. Those who have been isolated, or have been "invisible," so far have been given a voice, by giving them the opportunity to freely express themselves regardless of their economic status, gender or location of residence (*Ministry of Transport and Communications, 2005*).

Electronic business methods enable companies to link their internal and external data processing systems more efficiently and flexibly, to work more closely with suppliers and partners, and to better satisfy the needs and expectations of their customers. E-business allows for conversations to happen quickly, faster decision-making saves time, and time is money in business (VIT, 2010.)

Innovations in electronic communications technology spurred the Information Age, a time period featuring fluid,

almost instantaneous information transmission. The digital world offers interfaces such as email, instant messaging and chat rooms that help with the simultaneous transference of information to a large number of people. For many organizations, electronic communication has become a necessity for participation in modern commerce. Electronic commerce has opened up many opportunities because it allows large-scale global collaboration (Blalock, 2005).

Digitalization as an object of focus for achieving integrated public administration. The main objectives of the state towards digitalization are to correct the shortcomings of market mechanisms, overcome institutional and legislative barriers, attract relevant investments, stimulate the development of digital infrastructures, create needs for the use of digital technologies by the population and develop the corresponding digital competencies necessary for digital entrepreneurship.

Albertin and Moura, (2004) state that the benefits of IT can therefore be defined as cost savings, productivity, flexibility, quality and innovation; these benefits can be understood as "a present" that this technology gives to the organizations. However, just as important as the present is how it is taken advantage of it in relation to business performance. *Figure 1* shows these benefits and gives examples of how they are measured.

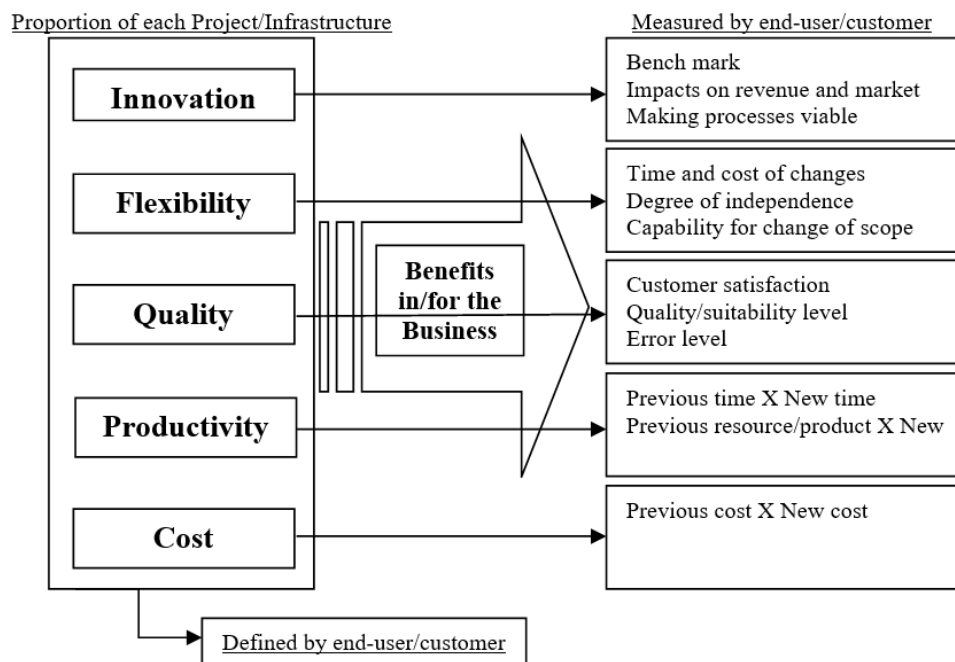


Figure 1 Benefits offered by the use of Information Technology, *Source: Albertin and Moura, 2004.*

Having regard to the foregoing, strategic use of the ICT in business could bring benefits in several areas:

- **Support Innovation.** Organizations that want to improve their innovation capabilities and develop new

products or services for the market can use cloud computing to speed up the process. This provides an important strategic advantage by enabling the organization to get new products to market quickly, ahead of the competition.

- **Improve Responsiveness.** Cloud computing enables organizations to scale up their IT resources quickly in response to changing market conditions. Organizations that offer products and services online may find it difficult to handle a surge in traffic, which could result in lost business. Adding resources from the cloud provides a strategic advantage by enabling them to respond to changes in demand, increase revenue and maintain customer satisfaction.
- **Increase Collaboration.** IT solutions that improve collaboration in an organization can provide an important competitive advantage. Issuing field service teams with smartphones, for example, enables service engineers to provide a faster, more efficient service to customers. Engineers working on a customer site can set up voice or video conference calls with product or technical experts at headquarters to discuss and resolve a complex issue, rather than delaying a repair. Offering customer superior service provides a strategic advantage by differentiating an organization from competitors.
- **Enhance Customer.** Insight collecting and analyzing data to gain greater insight into customers' needs and preferences provides a strategic advantage. By using powerful analytics software, organizations can develop customized offers and personalized communications that help to increase customer satisfaction and foster loyalty.
- **Introduce New Business Models.** Organizations can use IT to make strategic changes to their business models. A company that traditionally sold products through retail outlets might use IT to develop an e-commerce model that enables it to reach a wider market, reduce its distribution costs and offer a more convenient service to customers (Linton, 2019).

It is important for countries to undertake structured efforts to create and harness the benefits of digital economy in order to realize greater job creation, increase country competitiveness, allow for greater diversification and catalyze innovations in service delivery to improve the lives of their citizens.

3. INFORMATION AND COMMUNICATION TECHNOLOGIES IN THE REPUBLIC OF NORTH MACEDONIA

3.1 The strategic approach of the Republic of North Macedonia to the legislation and electronic communications regulation

According to the data of the State Statistical Office, in the first quarter of 2018, 79.3% of the households in North Macedonia had access to the Internet at home. The

participation of households with fixed broadband connection in the total number of households is 70.4% in 2018. In the first quarter of 2018, 79.2% of the total population aged 15-74 used the Internet, and 68.7% used the Internet every day or almost every day. Mobile phone or a smart phone was the most used device for access to the Internet, by 81% of Internet users in this period, and mostly among persons aged 15-24 (91.8%). 74.9% of the people used computers, laptops, smartphones, tablets or other portable devices at work. 31.6% of the people who used the Internet ordered/purchased goods or services over the internet in the last 12 months, and the majority of them (54.9%) bought clothes or sports equipment.

According to the data of the State Statistical Office of the Republic of North Macedonia (SSO, 2018a) in 2018, 94.4% of the enterprises used computer in their work. 81.5% of the enterprises with 10 or more employees had the fixed broadband connection to the Internet. From the total number of the enterprises 53.9% had website/homepage. From them, 89.6% provided on their website descriptions of goods or services, price lists, 51.7% had links or references to their social media profiles, and 21% provided online ordering, reservation or booking. Regarding e-commerce, 5.7% of the enterprises received e-sales orders via computer network, and 4.4% of the enterprises received orders for products or services via Web- sales.

The Republic of North Macedonia has committed itself to approximation to the EU regulatory framework in the field of electronic communications. As a result of that commitment, the Law on Electronic Communications was adopted in 2005, which is fully harmonized with the EU regulatory package for electronic communications since 2002, and is legal framework for the full liberalization of the electronic communications market. Existing Law on Electronic Communications ("Official Gazette of the Republic of Macedonia" No. 13/2005; 14/2007; 55/2007; 98/2008; 83/2010; 13/2012; 59/2012; 123/2012; and 23/2013, 39/2014) is fully aligned with the 2002 EU Electronic Communications Directives package. With a view to further development, the new legal framework should encourage and promote effective competition, investment and innovation, in particular with introducing next-generation broadband networks. The Law on Electronic Communications provides interconnection and access conditions by applying the principle of transparency and non - discrimination, the determination of operators with significant market power on a relevant market, universal provider selection service, introducing a procedure for notifying legal entities and individuals before start building public electronic communications networks and providing communication services, providing access to the services of

another operator and more (*Law on Electronic Communications, 2005*).

The Agency for Electronic Communications was established by the Law on Electronic Communications ("*Official Gazette of the Republic of Macedonia*" No. 13/2005, 14/2007 and 55/2007 and 98/8/2008 and 83/2010) in 2005, as an independent regulatory body in the electronic communications markets. The Agency as a regulatory body is focused on the market, ensuring openness of public communication networks, the development and promotion of electronic communications networks and services, market analysis and the identification of operators with significant market power, tariff control, service price control, and more (*Law on Electronic Communications, 2005*). In order to regulate the electronic communications market in a systematic way, the Agency has well-defined goals to be achieved. The Agency has guidelines to achieve the goals of a competitive marketplace that will create the conditions for end-users to use the best quality and affordable electronic communication services.

On September 21, 2005, the National Assembly of the Republic of Macedonia adopted a National Strategy for Development of Electronic Communications with Information Technologies (Strategic Guidelines) prepared by the Ministry of Transport and Communications (*Ministry of Transport and Communications, 2005*). The need for adoption of this national strategy stems from the Law on Electronic Communications (*Official Gazette of the Republic of Macedonia No. 13/2005*), as well as from the basic generally accepted premises concerning the future development of the Republic of North Macedonia. This strategy represents the Republic of North Macedonia a top priority document with full implementation of projects, measures and the activities envisaged therein have a real opportunity to bridge the state the digital divide and in a short time make a significant jump in economic development, reducing unemployment and poverty, developing the digital economy, research and partnerships with industry (*Ministry of Transport and Communications, 2005*).

The National Strategy has a mission to include the economy of the Republic of North Macedonia in the world map of networked economies, creating the conditions for the leap in developing the economy (leap-frogging) through an aggressive introduction and massively efficient use of electronic communications and information technologies, which will enable the following 5 years to bring Macedonia closer to the average of the new EU member states, as measured all the more important indicators, both in terms of ICT and purely economic

indicators.

Considering that the introduction of the information society in North Macedonia directly depends on the degree of supply-side development (development of communication infrastructures and technologies) and the degree of development of the demand-side (use of services and content), both strategies (National Strategy for the Development of Electronic Communications with Information Technologies and the National Strategy for Information Society Development), are a strong driver of a balanced economic process that will lead to the establishment of Information Society in the Republic of North Macedonia, as by demand as well as supply (mainly broadband understood as technological service, i.e. the basis for the realization of all advanced services). The degree of development on the supply side, i.e. the development of communication infrastructures directly depends on the process of liberalization and development of competition in the market electronic communications.

In terms of service utilization, the development of broadband networks plays a crucial role through policies that will stimulate demand for different types of services. These policies can provide financial incentives, improving government services through E-government, E-health, E-education, education of citizens, developing innovative public services, providing protection systems and trust, connecting public administration, schools, hospitals, small and medium enterprises, etc.

Commitment to create a proactive environment and environment to support the development of information society is also defined in the 2010 initiative of the European Union. The National Strategy for the Development of Electronic Communications with Information Technologies is based on the 2010 initiative of the European Union: creating a single information space with an open and competitive market offering access to electronic communications services and digital content, promoting the development of information and communication technologies as a driving force for the development of digital society, and the creation of an inclusive information society by bridging the digital divide (*Ministry of Information Society and Administration, 2010*).

3.2 Insights and experience on the prevalence of ICT technologies in institutions and companies in North Macedonia

The efficient, effective and professional functioning of the public administration in each country is one of the key factors for its democratic, political and economic development. The way the public sector performs its functions directly affects the quality of life of the different

categories in society. The introduction of information and communication technologies is one of the key approaches in reforming public administration by using ICT tools to improve many different segments of its functioning (*Ministry of Information Society and Administration, 2010*).

While it is quite clear that ICT cannot solve all the problems in the functioning of public administration, it is a surprisingly long list in the areas in which their proper implementation can positively affect. The use of ICT in the public administration has enabled the improvement of the internal organization and efficiency of institutions, as well as the conditions for the secure storage and internal exchange of relevant data, the emergence of the Internet laid the foundations for the establishment of broad communication and direct access to each interested user to public institutions. In other words, the Internet opened the possibility to increase the availability of data through the websites of public institutions, as well as to open electronic communication channels through which users can access the data and services of public institutions at any time and from any place (*European Commission, 2014*).

Electronic communication in North Macedonia has been largely implemented and is still in the process of modernization in the institutions and companies that exist to meet the needs of the citizens (consumers), like the Health Insurance Fund (HIF), Public Revenue Office (PRO), Central Register, banks and so on.

With the Health Insurance Fund web portal software solution project, HIFM is among the first institutions to start implementing e-services for its insureds. The digitalization of medicine is a vital for the development of the sector and the effective provision of medical services. Digital medicine ensures the interaction between patients, medical workers and institutions using information and communication and digital technologies. The following services are available:

- For insurers - access to personal insurance and insurance data of its members, data on selected general practitioners, dentistry and gynecology for themselves and their members younger than 14 years.
- For companies - an opportunity for electronic application for health insurance for persons for whom M1 application has been received from the Employment Agency of Macedonia, electronic application for their members and registration of members. The authorized person must have an electronic health card in order to use this service.

- For health care providers - opportunity to check insurance coverage for insured persons using health services.
- For selected GPs, gynecology and dentistry - the possibility of electronic change of a chosen doctor, follow up of records of insured persons with active reports, records of logs, etc. In this way, there is no need for companies and family doctors to come to the regional offices of the Health Insurance Fund.

In banking, the speed of digitalization is unprecedented. This implies revolutionary changes in information processing systems of banks, qualification requirements and financial services. There is a change in the banking system model, which makes it possible to reduce costs and increase the productivity of financial services. At the same time, digitalization in banking involves the accumulation of intangible capital, which is not always properly evaluated in the capital markets, thereby creating "bubbles", as well as significant problems related to confidentiality, regulation, control, supervision and the inability to ensure equal conditions for all participants of the banking market. With the development of information technology and its application in North Macedonia new trends in banking are introduced, new and improved services are offered and clients can freely choose the way they interact with the banks. Although North Macedonia cannot be compared to Western European countries in terms of the use of electronic financial services, in recent years there has been a great improvement in this regard, ie electronic banking is in continuous process of development.

The development of digital technologies in the Public Revenue Office (PRO) of the Republic of North Macedonia from 2011 onwards is perceived as reducing the flow of paper documents and in increased electronic business, enriching the database and increasing the level of transparency and accountability of each individual. An electronic archive means electronic recording, storage, and deployment of all incoming and outgoing documents and registration of their internal movement. Completion of the initial design of the electronic archive (document management), the design of the deployment and monitoring of the movement of documents in the PRO (document flow management), the introduction of an electronic signature for each employee and the creation of an electronic file for each subject and an electronic file for each taxpayer.

The system of electronic registration in the Central Registry offers a fast, simple and a reliable way of realizing all kinds of registrations in the Trade Registry of legal entities. In addition, when registering a legal entity, there is a

possibility to register a legal representative in the obligatory social insurance fund (pension, disability, and health insurance).

Distance learning systems, e-learning, lifelong learning and other flexible forms of learning, as well as opportunities for developing and presenting multimedia and multilingual content, are just some examples of the place of information and communication technologies in the new e-education.

Considering E-democracy, digital technologies provide new opportunities to attract citizens to participate in social and political processes. Traditional democratic processes (offline) can be transferred into digital. The forms of the e-democracy development are e-parliament, e-voting, e-justice, e-mediation (pretrial settlement of disputes), e-referendum, e-consultations, e-petitions, electronic political campaigns and polls. But the most important area is electronic voting. This is the simplest form of e-democracy, but its implementation brings a number of political and organizational challenges. In addition, it is this form that is gradually being introduced in various countries, thereby forming international practice. Providing voters with electronic means of voting is a matter of optimizing electoral technologies. Voting via the Internet facilitates access to the procedure for a significantly large number of citizens, increases the overall efficiency of obtaining voting results and makes it possible to vote remotely (New Digital Economy, 2011). The creation of an electronic voting program will attract a larger number of citizens, especially young people,

improve the representation and quality of elections, as well as reduce possible falsification of results.

4. RESULTS FROM THE RESEARCH

To gain a better picture of the usage of ICT in North Macedonia, as well as users satisfaction and perception of the degree of improvement of the effectiveness and efficiency of the companies and public institutions, "face-to-face", semi-structured, interviews were conducted with the citizens, the managers of the private sector companies using the electronic services, the employees, the heads of state institutions in the Republic of North Macedonia, such as the Public Revenue Office (PRO), Health Insurance Fund of North Macedonia, Central Registry, Banks, and others. We developed 3 types of Questionnaires: for the managers, for the employees and for the customers or users of services.

Forty respondents (managers in companies and institutions) using electronic communication tools participated in this study and were asked to evaluate the effectiveness of their company or institution with the use of electronic communications tools. They were asked to compare the level of satisfaction they have for three years (from 2016 to 2018). Their answers are systematized in Table 1.

From Table 1, we can conclude that from 2016 until 2018 the level of satisfaction is continuously increasing while the level of dissatisfaction is continuously decreasing, indicating that with the introduction of electronic communication in the companies and institutions efficiency is increased from an average rating 3,58 to 4,21.

Table 1. Level of satisfaction of the managers using electronic communications tools

Are you satisfied with improving the efficiency of your company's operations by using electronic communications tools?						
Year of Survey	Unsatisfied	Partly Satisfied	Satisfied	No Answer	Total	Average Rating
	%	%	%	%	%	
2016	21,4	21,2	51,3	6,1	100	3,58
2017	8	32	56	4	100	3,58
2018	7,38	33,76	57,2	1,66	100	4,21

Table 2 shows the answers to questions that were an integral part of Questionnaire No. 2 that was conducted in 2019 from May to August. Questionnaire No. 2 was composed of 11 questions that were strictly related to the research topic. The respondents voluntarily filled in the questionnaire but due to the protection of personal data, their identity remained anonymous. The survey was conducted also by 40 respondents employed in institutions using electronic communication facilities.

Questionnaire No. 3 shows the level of satisfaction of the customers or users of the products and services of the

companies and institutions (Table 3). The respondents (20) were citizens who were accidentally found in the institutions and participated in the survey voluntarily.

The results obtained from the research indicate that the usage of electronic communication facilities in the institutions and companies in the Republic of North Macedonia efficiency, as well as the effectiveness, has been increased. Besides, the survey questionnaires provided results that showed increased satisfaction of the employees and citizens in the institutions with the use of electronic communication means.

Table 2. Level of satisfaction of the employees using electronic communication in the companies

Number	Question	n	Yes	No
			%	%
1.	Do you have experience using electronic communication in your institution?	40	65	35
2.	Has your company increased its efficiency by introducing and regularly using electronic communication in your company operations?	40	91	9
3.	Does your company regularly use electronic communication tools?	40	60	40
4.	Do you regularly communicate through electronic means of communication?		85	15
5.	Are you satisfied with the level of electronic communication in your company?	40	90	10
6.	Are you efficient in doing business using electronic communication devices?	40	82	12
7.	Do you find that your colleagues are effective in accomplishing their tasks using electronic communication?	40	78	22
8.	Do you think that working conditions improved at your company using electronic communication tools?	40	92	8
9.	Do you believe that better organization through electronic communication improves work efficiency?	40	94	6
10.	Do you feel a positive work atmosphere in your day-to-day work using electronic communication to perform your business activities?	40	95	5
11.	Do you think that increasing the efficiency of using electronic communication will increase customer satisfaction?	40	72	28

Table 3. Level of the satisfaction of the customers

Questionnaire 3 - Survey conducted with citizens		
	YES	NO
Are you satisfied with the work of institutions that use electronic communications and electronic services ?	88%	12%
Do you think that institutions are more efficient than before with the use of electronic communication?	92%	8%

5. CONCLUSIONS

Digital economy goes beyond e-commerce and e-business and includes doing business, conducting communications and providing services across all sectors including transport, financial services, manufacturing, education,

healthcare, agriculture, retail, media, entertainment and business using digital technologies. Digital economy plays a significant role in accelerating global economic development, enhancing productivity of existing industries, cultivating new markets and industries, and achieving inclusive, sustainable growth. At the same time, the digital economy is becoming a powerful catalyst and a driver of inclusiveness, by linking communities to each other in a sort of "global village", sharing information, ideas and products, and allowing countries to rise up the value chain.

The use of the digital technologies in the past period in the Republic of North Macedonia has experienced a special expansion in retail, financial services, education, health and so on. Generally speaking, the advantage of electronic over traditional communication is related to increased quality, agility in offering and providing additional services on the one hand and reducing costs and time in conducting transactions on the other.

The advantages of using digital technologies are: better

delivery of government services through fully coordinated and integrated public administration activities, improved interaction with the business sector and industry, quality and rapid response to civil needs and demands, citizen participation in building an information society, efficient government management, increased number of ICT experts and increased level of ICT literacy in public administration, open, participatory and democratic government, reduced corruption, increased transparency, increased revenues and reduced costs, new forms of evaluation and improvement of the public administration and the creation of value for society in general.

Citizens of the Republic of North Macedonia have open access to government information and services and will have the opportunity to participate in building a democratic society in North Macedonia through the use of the Internet, telephony and other technologies, face reduced corruption, greater transparency and increased information security in practicing their rights and obligations. Web processes should make life easier and more comfortable for citizens: they do not have to be physically present to use the services, they do not have to wait in line, there is no working time, no waste of time walking from one institution to another, there are only simple processes and forms that are logically designed.

The business sector in the Republic of North Macedonia has broader and more open access to information, a better business climate, economic vitality, and will face greater transparency, reduced corruption, greater accountability and trust to the state administration in exercising its rights and obligations. In the same way cooperation between institutions that use digital technologies has been improved. It can be concluded that the development and application of e-technologies is one of the strategic priorities of the state and that their implementation is a structured and planned process that improves the functioning of the public and business sector.

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