

THE INFLUENCE OF SERVICE INFORMATION SYSTEMS ON STRENGTHENING COMPETITIVENESS AND EFFICIENCY OF BUSINESS OF SMALL AND MEDIUM-SIZED ENTERPRISES (SMES)

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Abstract: *The change in the metaphor of efficient business and the generation of sustainable competitiveness was primarily due to the impact of the globalization of business activities and the mass implementation of innovative technologies, which is why efficient production and quality products are no longer the focus of quantitative-qualitative advantages and strengthening the competitiveness of companies, they but it rather the tasks of e - sales, supply chains, marketing and customer relations, etc., as well as compatible and efficient information systems of payment, education and continuous learning, health care of employees, state administration, etc., which all indicate the need for diffusion, as well as the permanent generation, adaptation and development of quality and efficient information systems within the framework of new strategies and e-business.*

Electronic business, otherwise based on the inclusion and efficient exploitation of the potential of Information and Communication Technologies (the implementation of which obviously determines the ways in which companies implement their business processes), i.e. Internet technologies and information systems, as well as organized integrated databases, provides the possibility of a simplified exit to the global market with minimal investment, as well as the possibility of quick and efficient changes in business processes and the generation and development of new business models, and what with the implementation of Just In This and Quick Response Systems ways of doing business, fundamentally leads to the generation of comparative advantages of such business systems and strengthening competitiveness.

The fact that today nuances or millionths of some value in business bring an advantage in quality or economic valorization and decide on advantages in strengthening competitiveness or efficient optimization of business, require greater attention and critical consideration of the importance of implementation and efficient exploitation of the so-called service information systems (e-administration, e-education, e-health). Service information systems with all their nuances - qualitative sociological, humanistic, cultural or human resources elements, generally include the entire business through their integrative functions, are easily adapted in a variable environment and eliminate spatial limitations and problems of dislocation of individual segments of the business process, and can be crucial in generating elements efficient business and strengthening the competitiveness of companies.

The paper presents an overview and analysis of the impact of service information systems, as important links in the E-business chain, from the aspect of improving the optimization and efficiency of operations, reducing costs and strengthening the competitiveness of companies, with special reference to the operations of SMEs in the textile and clothing industry.

Keywords: service information systems, e-administration, e-education, e-health, SME textile and clothing industry, strengthening competitiveness.

UTICAJ USLUŽNIH INFORMACIONIH SISTEMA NA JAČANJE KONKURENTNOSTI I EFIKASNOST POSLOVANJA MALIH I SREDNJIH PREDUZEĆA (MSP)

Apstrakt: Promena metafore efikasnog poslovanja i generisanja održive konkurentnosti nastala je pre svega zbog uticaja globalizacije poslovnih aktivnosti i masovnih implementacija inovativnih tehnologija, pa tako efikasna proizvodnja i kvalitetan proizvod više nisu u fokusu kvantitativno-kvalitativnih prednosti i jačanja konkurentnosti preduzeća, već su to poslovi e-poslovanja - prodaje, lanaca snabdevanja, marketinga i odnosa sa klijentima, itd., ali i kompatibilni i efikasni informacioni sistemi plaćanja, obrazovanja i kontinuiranog učenja, efikasne zdravstvene zaštite zaposlenih, poslova državne uprave, itd., što sve zajedno ukazuje na potrebe difuzije, kao i permanentno generisanje, adaptaciju i razvoj kvalitetnih i efikasnih informacionih sistema u okviru novih strategija i e-poslovanja.

Elektronsko poslovanje, inače zasnovano na inkluziji i efikasnoj eksploataciji potencijala Informaciono Komunikacionih Tehnologija (čija implementacija očigledno određuje načine na koji preduzeća realizuju svoje poslovne procese), odnosno internet tehnologija i informacionih sistema, kao i uređenih integrisanih baza podataka, pruža mogućnosti pojednostavljenog izlaza na globalno tržište uz minimalna ulaganja, kao i mogućnosti brzih i efikasnih promena poslovnih procesa i generisanja i razvoja novih poslovnih modela, a što uz implementaciju Just In Time i Quick Response Systems načinima poslovanja, suštinski vodi ka generisanju komparativnih prednosti takvih poslovnih sistema i jačanju konkurentnosti.

Podatak da danas nijanse ili milioniti deo neke vrednosti u poslovanju donose prednost u kvalitetu ili ekonomskoj valorizaciji i odlučuju o prednostima u jačanju konkurentnosti ili efikasnoj optimizaciji poslovanja, zahtevaju veću pažnju i kritičko sagledavanje važnosti implementacije i efikasne eksploatacije tzv. uslužnih informacionih sistema (e-uprava, e-obrazovanje, e-zdravstvo). Uslužni informacioni sistemi sa svim svojim nijansama - kvalitativnim sociološkim, humanističkim, kulturološkim ili elementima ljudskih resursa, uglavnom obuhvataju celeokupno poslovanje kroz svoje integrativne funkcije, lako se adaptiraju u varijabilnom okruženju i ukidaju prostorna ograničenja i probleme dislociranosti pojedinih segmenata poslovnog procesa, i mogu biti presudna u generisanju elemenata u efikasnom poslovanju i jačanju konkurentnosti kompanija.

Rad predstavlja pregled i analizu uticaja uslužnih informacionih sistema, kao važnih karika lanca E-poslovanja, sa aspekta poboljšanja optimizacije i efikasnosti poslovanja, smanjenja troškova i jačanja konkurentnosti preduzeća, sa posebnim osvrtom na poslovanje MSP tekstilne i odevne industrije.

Ključne reči: uslužni informacioni sistemi, e-uprava, e-obrazovanje, e-zdravstvo, MSP tekstilne i odevne industrije, jačanje konkurentnosti.

1. INTRODUCTION

As the process of globalization radically changes the position of companies in the market, and the local market as a form of protected area for local companies ceases to exist, companies are forced to rapidly find elements to increase their competitive capabilities and actively participate in the market competition. Being more competitive today primarily involves the massive implementation and exploitation of ICT, as well as increased investment in research into other innovative technologies, products and markets, along with business optimization and cost rationalization.

All the inputs of modern and efficient business indicate that for the effective progress and development of the economy of a country, the increasing inclusion of technical-technological innovations and the efficient exploitation of their potential is necessary, but with an increasingly massive and aggressive implementation of ICT technologies and a strong potential of human resources.

However, as the traditional ICT sector is often no longer able to follow the development of new technologies and organizational and business changes, it is obvious that the introduction of various innovative

business information systems would be a good solution, because such systems, through their integrative functions, generally include the entire business of companies and are easily adapted in a variable environment. In fact, it can be said that modern and profitable business today is unthinkable without the timely and rapid implementation of compatible and efficient information systems and adequate work and development strategies, with a firm reliance on information technology (which in total represents the so-called innovative business).

On the other hand, the fact that changes in the environment and way of doing business require a better understanding and integration of data, as well as their more efficient exploitation, in the processes of functioning and business development, and also point to the need for permanent generation, adaptation and development of quality and efficient information systems, the implementation of which is based on the exploitation of the infrastructure of ICT technologies and integrated databases [1]. It should be pointed out that due to the problem of non-complementarity and incompatibility of implemented information systems, the lack of qualified human resources [2, 3], as well as low-quality and inadequate ICT technologies and technical-technological bases, the existence and efficient functioning of information systems are not possible, whereby the anticipation of the solution to this problem would be reflected in the implementation of adequate and compatible information-communication technologies and systems, moderate or controlled globalization of the business environment and market, but also in the existence of systemically integrated databases. In addition, it is a fact that the compatibility of information systems continuously increases the amount and exploitation frequency of useful and available data and information, which directly affects the degree of organization and arrangement of the company and the requirements for the formation of a warehouse of specific analytical databases, which enable easier and more efficient making of quick and adequate business decisions. In practice, the fact that the infrastructure of the electronic business system is based on ICT, i.e. Internet technologies and information systems, with organized integrated databases [4], indicates the possibility of quick and efficient changes in business processes and the quick and efficient generation and development of new business models, which essentially indicates the comparative advantage of such business systems and the possibility of strengthening competitiveness, because the implementation of ICT, information systems and modern innovative technol-

ogies today completely determines the way to which companies implement their business processes, whereby in such new ways of doing business, the elements of globalization, mobility and interaction can be clearly observed, as well as the unequivocal need for the implementation of Just In Time and Quick Response Systems ways and principles of business. It can also be seen that new technologies today eliminate spatial limitations and problems of dislocation of business process segments, and that the Internet infrastructure or ICT technologies are used to coordinate and synchronize activities in these processes, noting that information systems in modern business processes do not have to be conditionally connected (they can function separately - individually), but that the compatibility and coherence of these systems are still necessary or even mandatory elements of higher quality, more efficient and more successful functioning and business. It is obvious that new ways of doing business require the comprehensive inclusion of new technologies and information systems with a high degree of connectivity and automation, which in the case of service information systems means, from automation in the health and education sectors, to the automation of payments, banking and state administration systems, where economic, sociological, cultural or human resources aspects are equally important in addition to technical and technological aspects.

2. ELECTRONIC BUSINESS

E-business is not a change that has arisen solely through the implementation of new technologies for new ways of working or executing processes, but rather new processes, new strategies, and ultimately, a completely new way of thinking and doing business, and is therefore increasingly being treated as an innovation. However, given the conditions in the business environment and the globalization of business, it is obvious that the implementation of e-business services is not sufficient to achieve a competitive advantage, but rather it is necessary to develop new, innovative business strategies and models that will massively implement, but also maximally exploit the capabilities of ICT technologies and information systems. For that reason, e-business represents clearly defined and visible advantages for all participants in the business process (companies, customers, stakeholders, society, ...), obtained through fundamental changes in previous business practices in part of the infrastructure components through the implementation of ICT and information systems, but also in the generation of innovative strategies (red ocean and blue ocean) and operational processes of e-business.

In fact, when transitioning to e-business, existing business processes must be adapted to new business models and forms of business, i.e. it is necessary to reengineer business processes, critically examine current business policies, practices and procedures, as well as reconsider and redesign processes, products and services, in order to achieve improvements in key business performance indicators. It can be said that a company can achieve an efficient and cost-effective electronic business system if it has sufficiently implemented new technologies (especially ICT) and there is a willingness to reengineer the business process, but also if it has a certain information and communication infrastructure and has business processes at the level of database management and strategically and operationally uses data the information system for management at different hierarchical levels of decision-making. Also, since the key features of e-business are: globalization, universal standards, compatible information systems, business process optimization, organizational culture [5], extensive databases, interactivity and personalization, but also speed, improved productivity and knowledge sharing between organizations and institutions in order to achieve competitive advantage, it can be said that for modern, efficient and successful business, it is necessary to achieve a high degree of interoperability between companies.

On the other hand, the fact that the infrastructure of e-business systems is based on the Internet and Internet technologies (cloud computing, Internet of Things, big data, ubiquitous computing, etc.) implies efficient connection of internal and external processes and a more efficient way of implementing processes, as well as rapid changes in business processes with a strong impact on the development of new business models. Of course, it should be emphasized that the implementation of e-business opens up the possibility for companies to enter the global market more easily with minimal investment, because the integration of business processes ensures easier access to information and improved relationships with stakeholders, while products and services are offered to customers in a more efficient manner - through various services or information systems, in accordance with their requirements and needs, regardless of time, place and context [6]. In fact, it can be said that the new paradigm of business today is represented by virtual companies, with ICT technologies, the Internet, information systems, the world wide web and customers at the center of events, along with electronic business with a set of functional entities that have their own information systems (production, business and service

systems, human resources systems, planning systems, etc.).

3. SERVICE INFORMATION SYSTEMS

3.1. E-government

The term E-government refers to the provision of public administration services to citizens and businesses through the use of information and communication technologies, enabling the implementation of business transactions between the government and its services, agencies and partners, all with the aim of increasing business efficiency and facilitating administrative services for citizens and businesses. From the aspect of business activities, e-administration tasks include: fast and efficient e-registration of companies, electronic cadastre, online public procurement, taxes, customs and customs declaration tasks, etc., but also tasks of the availability of various information of interest to employees, such as notifications about public works, obtaining an identity card and passport, checking account balances, conditions or time of enrollment in kindergartens, schools or colleges, etc. [7]. In fact, the essence of the new way of functioning of E-administration represents the final part and the most direct implementation of the so-called E-businesses, through the direct delivery of various information systems, seen as government electronic services, to various target groups and organizational entities (government services, agencies and partners).

The realization of e-government is otherwise based on the concept of mutual interaction of four target groups: public administration - G, employees - E, business sector - B and citizens - C, so there are G2B, G2C, G2E and other ways of collaboration and functioning, and with infrastructure seen through adaptive internet portals and subportals (with various websites), computer networks, identification (with functional authentications and identifications), etc.. It should be emphasized that the portal is one of the most important elements of e-services, as well as that it represents a unique point of access for citizens and business entities to e-services or web-sites, regardless of the existence and possibility of classic - traditional access (direct communication, telephone, SMS message, etc.). The heterogeneity of data integration and business process applications in e-government represents a particular challenge, because therefore the interoperability of e-government systems must be achieved at all levels - technical (which implies ensuring communication and exchange in terms of communication protocols, data exchange and messaging between applications), semantic (which can be de-

defined as the ability to share, aggregate or synchronize data/information between heterogeneous information systems) and organizational (which should respond to user requests by making services available, easily recognizable, accessible and user-oriented) [5].

3.2. E-education

Continuous and accelerated changes in all spheres of society, the specialization of production, the implementation of modern and sophisticated business information systems and the obvious general turn of the industrial sector in the ways of doing business, point to the necessity of long-term planning of technological development, extensive investments and permanent and efficient education of an adaptable and flexible workforce, ready for the necessary requirements of rapid learning and adaptation to new business situations, with special reference to highly professional education and knowledge of new and sophisticated technologies, as well as to the creation of quality base of human resources (because jobs in which once mastered knowledge is applied in the same way until the end of working life are increasingly rare) [2, 8]. This means that the usual view of education, as an interaction on student-content-teacher relations, must be changed, with the necessary inclusion or implementation of modern ICT technologies and information systems in such processes, which all together represent the so-called E-learning, which in its essence implies modules of classic learning, with the effective exploitation of multimedia and the Internet for the purpose of improving the quality of learning, that is, learning with extensive exploitation of computer technology in the processes of acquiring knowledge, but with a special emphasis on remote sources and long-distance communication - on-line (also known as Blending learning, hybrid or mixed mode) [9]. Otherwise, online courses are mainly designed and created by teachers - lecturers, whereby the creation of teaching content for such courses can be realized using dedicated software tools, while the content created using such tools can be integrated into courses, using appropriate standards and learning objects. For all of this, as well as for reasons of diversity and distribution of resources and content, the focus of e-learning is on the adoption and development of standards, with a special emphasis on the development of teaching materials, where it should be emphasized that an insight into the elements of e-education would not be complete without highlighting possible pedagogical and technical approaches in e-education, where, as characteristic and often exploited, the following can be distinguished: adaptive

education, problem-based learning, virtual worlds in education, learning on social networks, mobile education, etc.

3.3. E-health

E-health represents the implementation of ICT in general healthcare - the health needs of citizens or patients, but also the needs of healthcare professionals and healthcare institutions, in order to improve access, efficiency, effectiveness and quality of medical and business processes, in terms of E-health components, such as: e-card, e-prescription, e-referral and e-health booklet-card, with the ultimate goal of improving the patient's health status [7]. In fact, it can be said that the rationalization and reduction of healthcare system costs, through simpler, automated and synchronized access to health data [10, 11], faster service provision, creation of a fully integrated healthcare system, efficient measurement of key indicators of the state of the healthcare system, but also through facilitated education and training of experts, wider availability of medically relevant information and easier establishment of cooperation at the global level, as well as through new ways of managing and making decisions, performing business processes, planning and reporting, organizing institutions and delivering information, increasing transparency and availability of information and improving the work of the administration, are the most significant reasons for introducing e-health systems [7]. From all of the above, the strategic priorities of e-health can be identified, with the most important being speed (which is achieved by establishing an information infrastructure and generating an integrated database) and always available data (for which it is necessary to define standards for management, storage and transmission). Of course, should also be highlighted as important priorities interoperability (which is achieved by integrating all parts of the health system as a whole and is an important prerequisite for the digitalization of health conditions and the diversification of e-health) [11, 12], as well as security (which is achieved by unifying health and social information systems into a single system, through the existence of an e-portal). It should be noted that when generating a Health Information System, a holistic model can be applied - which implies the integrity of the system, or a cumulative model - where the final system results from the sum of individual subsystems (e.g. outpatient clinic, dispensary).

On the other hand, the entire concept of exploiting ICT technologies for the purpose of providing remote healthcare is also known as telemonitoring or

telemedicine (as a tool for learning, staff education, remote diagnosis or monitoring of patient conditions, etc.), and can be viewed through three categories: store-and-forward, remote monitoring and real-time interaction, with the note that most areas of classical medicine can be implemented in some form using the concept of telemedicine. Unfortunately, due to many shortcomings, it is mainly applied to providing care to elderly, chronically ill people, giving advice and other operations that do not require the intervention of a doctor - telecare, then in the area of monitoring medication intake and writing prescriptions - telepharmacology, as well as in the areas of performing clinical therapies in neuropsychology or physical medicine, or for speech, audio and occupational therapies and the like - telerehabilitation [7].

4. ANALYSIS

In times when nuances determine quality, efficiency or sustainable competitive advantage, a greater commitment to the sociological, cultural or human resource components of business or production processes and their analogous information systems is clearly needed. Observing from that aspect, it can be seen that the Information systems that most enter the pores of the mentioned components the, or are even the most directly connected with them, belong to the group of so-called. service information systems (e-administration, e-education, e-health, e-payment), whose infrastructure is physically mostly dislocated in relation to the production or business part, and which essentially represent the components of the so-called public service, but which, by their existence, organization and level of exploitation, indicate and determine the quality and degree of organization of companies.

4.1 E-government

It is obvious that all the so-called public services of citizens (tax, issuance of personal documents, health services, customs regulations, enrollment in schools and kindergartens, etc.), along with information systems or services that are a "personal" part of the companies themselves (company registration, profit tax, environmental protection, public procurement, etc.), indirectly necessary for better quality and efficient work, and in any case indicate the quality and level of organization of each company. Of course, the interactions of all target groups of e-government are equally important, but as this work primarily deals with the importance and influence of elements of economic entities, i.e. business units or companies, special emphasis is placed on looking at G2B and B2G

collaborations within the public administration portal. As the name suggests, the essence or basis of G2B – Government-Business collaboration or services is in the communication of public administration with business entities, in terms of providing reliable data to businesses, as well as in terms of simple and quick implementation of administrative tasks (information, services, public procurement, etc.).

The constant pressure and wishes of the business sector to improve the efficiency, speed and quality of performing various tasks and administrative services, the so-called. of the public sector, as well as the possible reduction of costs and time, are constant requirements and important points of successful and efficient cooperation between the state administration and the private sector, which of course requires many prerequisites, from the existence of an Internet network and ICT infrastructure, through the generation of integral data bases and qualified human resources, to the generation and implementation of adequate applications for the electronic performance of selected services (company registration, issuing various certificates and confirmations, statistical analyses, access to databases, applying for more favorable state or global loans, etc.). Of course, in order for the communication to be complete and effective, a two-way flow of data and information is necessary, which in this case is a B2G collaboration, or a service that serves in communication of business entities with the public administration, ie. In connecting state institutions and companies, with the aim of exchanging the necessary information, because in order for the state administration to function well and work efficiently for the benefit of the company, many data about the company itself and its work are necessary, which the companies should submit to the state administration.

As information technologies have the most important influence on processes within business organizations, in a way that changes and adapts them to business operations and the needs of the real system, the second part of the analysis will be with an emphasis on infrastructural elements, as very important elements of the very process of existence and functioning of e-government or service information systems, where from the aspect of infrastructural elements, as specificities or novelties, the existence and role of a unique e-portal (with identification as one of the basic functionalities of the portal, or viewed through the aspect of security of use - authorization and authentication), and the quality and types of computer networks [5]. It is obvious that information technologies have a very important impact on business processes in companies, because they change and adapt them

to business and the needs of the real system, but it can also be said that service information systems are important and necessary for the public sector, because their application eliminates hierarchical levels and additional paperwork [5]. Therefore, for a proper understanding of service information systems, including e-government, the emphasis must inevitably be on a qualitative in-depth analysis of the architecture of the e-government system, with its hierarchical structure and logical connection between the four layers: ICT infrastructure → e-business → e-government → users, through which the data and information of users and integrated databases “flow” (Figure no. 1):

And if singling out and emphasizing the differences in the implementation and exploitation of service information systems in SMEs of the textile and clothing industry seems unnecessary, because there seem to be no special requirements in relation to other SMEs, it is still possible to single out several elements that require a different treatment, that is, a different way of looking at the importance and impact of service information systems on the business processes of such companies.

One of the reasons for a different perception and analysis of service information systems in SMEs of the

textile and clothing industry is the specifics of the textile and clothing industry, which are reflected in small series, a large number of models, material specifics (creasing, grading, etc.), etc. [8], which, while looking at the architecture of e-government, indicate the need for completely new ways of defining all important business components at the very beginning of the idea of a new way of doing business, which is a motive for reengineering and optimization, as well as organizational innovations and the generation of new strategies for work and business development on those bases, but also an additional motive for the implementation and exploitation of service information systems.

As another reason for a different perception and analysis of service information systems in SMEs of the textile and clothing industry, the so-called cluster business (which represents the grouping of companies of different activities of related industries, and thus different - specialized suppliers and support institutions), which is otherwise very often recommended for SMEs in the textile and clothing industry, and already at the very beginning of its formation it is referred to close cooperation with the state, because it requires extensive coverage and processing of pre-

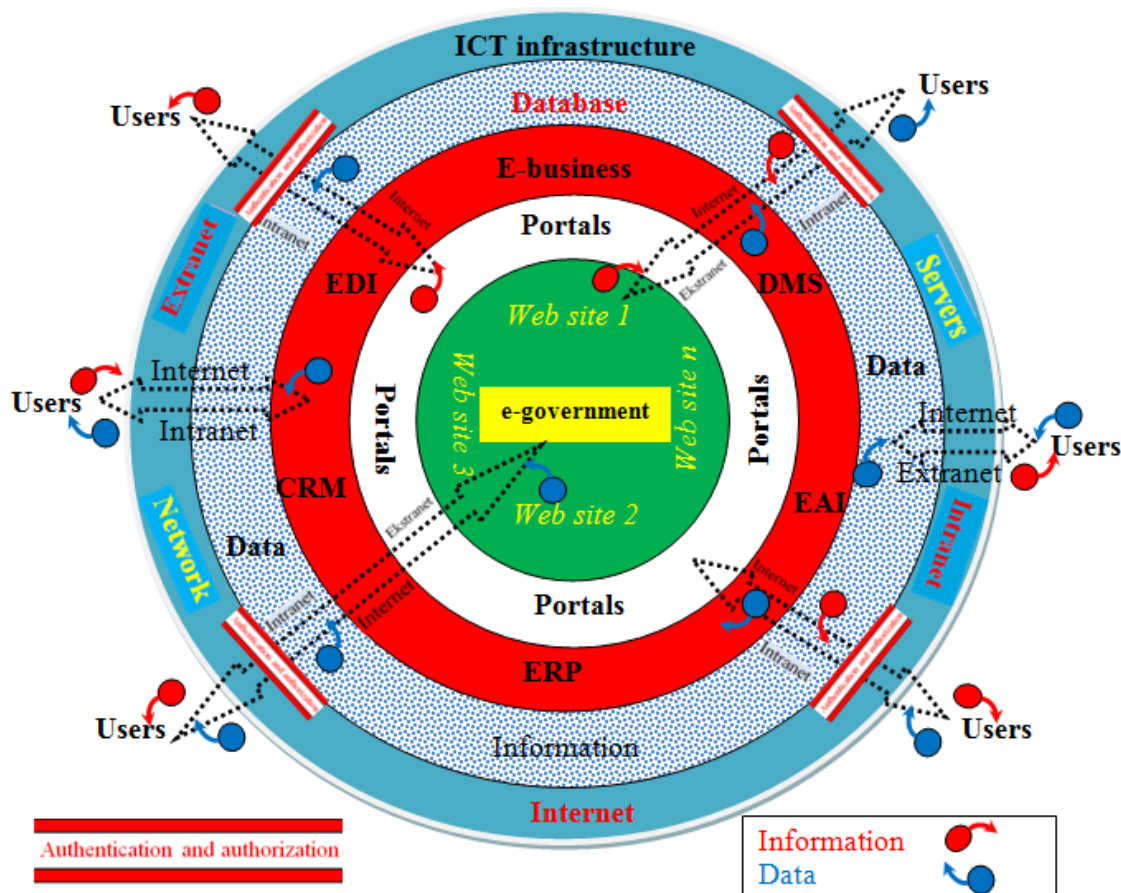


Figure 1: Hierarchical structure of the architecture of the e-government system

cise business documentation of (cluster) associated companies (by location, type of product, ways of doing business, etc.), all for reasons of efficiency of the business itself or the so-called functional efficiency, which requires frequent, accurate and fast exchange of information (eg for reasons of changing the way or increasing the volume of business, changing business partners, globalization of business, etc.).

In the era of globalization and internationalization of business, the third reason can be cited as the so-called LOHN business, which as a method of duty-free outsourcing of the labor-intensive T&O industry enables and accelerates the integration of the economies of developing countries, safe placement and better access to the global market, as well as the adoption of new managerial and technological knowledge, and otherwise it implies frequent changes of business partners and the type of work and requires a quick reaction of the company in terms of the arrangement of "paperwork", so as not to be incompatible with many technical-technological, economic, social, cultural, national and other peculiarities of the countries in which it operates. [5, 8].

Finally, as a fourth reason, which is in direct connection with the previously mentioned reasons, the need for the generation and exploitation of integrated databases can be stated, both for production reasons (rapid fashion change, gradation, continuous design changes, etc.), and for business reasons (sociological, cultural, administrative, etc.).

4.2. E-education

Education today represents one of the most important links in the development of any society, with a special emphasis on the development and implementation of ICT technologies and the interactive relationship with the economy.

The knowledge society, knowledge economy or knowledge-based industry, as well as the establishment of a flexible system of initial and continuous professional education, so that investment in education acquires the character of an investment investment, represent modern formulations of an invariant concept of development and prosperity of every society, so therefore educational and scientific-research activities should be more tightly and efficiently connected with the economy and state administration, in order to ensure the efficient acquisition of new knowledge and skills, along with the generation and production-economic valorization of innovations and diffusion and implementation of new technologies. With new technologies come new jobs, which require

flexibility, dexterity, adaptability and innovation, but also fast, efficient and continuous learning, which automatically implies changes in the education sector (primarily due to mass implementation and exploitation of the Internet and ICT), which will successfully follow new ways of doing business - which is an example of the so-called of e-learning [9, 13]. Temporal and spatial flexibility above all, but also easy and continuous communication and student-teacher interaction, as well as the development of sociological and communication skills, group work and the constructive principle of learning, with the facilitated use of interactive content for learning, or different media for the presentation of content (images, sound, video, animations, simulations,...), and with personalization, flexibility, adaptability and constant on-line availability of content, are just some of the good features and direct and obvious benefits of e-learning, which directly or indirectly indicate many connections with the quality and efficient operation of a company [14]. In terms of effective participation and influence on e-business, the characteristics of free choice of learning pace and method (active or passive), as well as choice of interaction level (written material, interactive simulations, multimedia, etc.) can also be singled out as important, all with the necessary continuous and practical work with new techniques and technologies, which acquires the necessary knowledge and skills of the so-called computer literacy (otherwise a necessary element of the general education of an academic citizen today, or the basic condition of "functional literacy" of the new age).

On the other hand, the most common problems in the practice of E-learning for students are: technical support or the existence and functioning of the ICT network infrastructure (responsibility of the state), dependence on technologies, but also adequate software systems for learning management - Learning Management System (with educational, communication, infrastructure and support services), which enable the creation and organization of online courses (responsibility of faculties, schools, etc.), as well as self-discipline in the part of organizing teaching monitoring (responsibility of students), while for lecturers - professors, it is a new and rather demanding continuous preparation and creation of the E-learning content itself for learning various programs, as well as programs and content according to student requirements (needs for new ways of communication or various multimedia and interactive content) [14]. The characteristic of adapting to the user based on his preferences and cognitive characteristics (which essentially represents personalization in education),

is only one of the specifics of adaptive education, as well as the fact that problem-based learning is based on the enhancement of interdisciplinary, joint and authentic activities, but also critical thinking, cooperation and communication between users. It should also be emphasized the specificity of virtual worlds in education, as a computer-generated environment, with specific user interaction through the so-called avatars - "digital self" and strong effectiveness in simulating real events.

When it comes to the companies of the T&O industry today, in the context of education and increasing global competition, the dynamic development of new technologies and the challenges of sustainable development, it should be emphasized that they must quickly adapt to the new demands of the global market, based on modern and adequate work and development strategies and the coexistence of the traditional and digital sectors, with the priority participation of ICT and a strong synergy between production, scientific research activities and education. The elements and specifics of SMEs in the T&O industry that require special consideration of e-education for this sector can be related to solving the problem of a chronic lack of professional staff, because work on innovative information systems in the T&O industry implies expert knowledge from several areas (from the T&O industry, ICT technology, CAD and CAM information systems, other business information systems, the field of engineering and mechanical engineering, ecology, etc.), which requires the generation of specific and professional narrow education programs, as well as the continuous exploitation of programs life-long learning, where e-learning programs meet all the prerequisites for a quality shift in work (innovativeness, personalization, accessibility, working from home, etc.) [3, 15].

4.3. E-health

Since the healthcare sector includes hospitals, pharmaceutical manufacturers, distributors and pharmacies, at first glance there is no apparent connection with the business or information systems of companies, which is the case with all modules of service information systems. [10, 16] However, when the sociological and humanistic aspects of healthcare are highlighted, as well as the participants in healthcare such as citizens (employees), employers, healthcare services, businesses, health insurance organizations, etc., then these connections are already apparent. Defining the design of business models in e-health depends on the presence of technologies, as well as identifying the area of e-health for which a particular

technology is being introduced, which implies defining a project of strategy, analyzing and selecting technologies, as well as allocating stakeholders for the implementation of the model, while on the other hand indicating the necessity of the participation of experts of various profiles in such work [11, 17]. In fact, it can be said that the adoption of certain technologies in an e-health area requires the participation of multidisciplinary participants and relevant stakeholders, which requires the establishment of partnerships using an open or networked business model, with simple and functional technology for end users (physicians and patients), as well as the existence of an Internet portal as an intermediary in the delivery of e-health services between physicians as service providers and patients as end users. The positive side and one of the most important advantages of implementing E-health information systems is enabling the integration of subsystems of all healthcare segments, through separate healthcare information systems (e.g. diagnostics, radiology, surgery, cardiology, etc.) at all levels (local, national and international), which simplifies the processes of communication with patients and doctors, as well as the processing and exchange of information as decision-making support, because patient data is integrated and stored in a single integrated database (accessed through a web application). [4, 11, 12].

As for the peculiarities and opportunities for companies in the textile and clothing industry, perhaps the existence of e-health applications in the field of prevention and protection only for this branch of industry would be pretentious, but considering all the specifics of this industrial sector (dyeing processes and other chemical treatment of materials, physical treatments of materials and waste dust particles, specific mechanical injuries, etc.), it would certainly have positive effects (both from the aspects of doctors and from the aspects of patients) [10, 18].

5. CONCLUSION

Modern, efficient and successful business and continuous creation of competitive advantage implies high interoperability between companies, optimization of business processes, wide integrated databases, interactivity and personalization, JIT and QRS business methods, as well as compatible production and business systems, but increasingly also adaptable and efficient modules of service information systems (e-government, e-education, e-health).

E-government must enable simpler and faster access to necessary business administrative "papers", as well as greater efficiency and complete transpar-

ency in the operations of public administration, easier access to public services for citizens and businesses (through the portal service information system e-government), which significantly affects the efficiency and quality of business operations of companies, as well as strengthening competitive advantages, and ultimately the economy of each country. Business in today's times requires increasing flexibility, adaptability and innovation, and thus implies fast, efficient and above all continuous learning, which requires changes in the education sector, in terms of reliance on the effective exploitation of the Internet, ICT and information systems, what with features such as temporal and spatial flexibility, easy and continuous student-teacher interaction, development of sociological and communication skills, facilitated use of interactive content, personalization, etc., represents the basis of flexible and efficient so-called of e-learning. The service information system of e-health presents its quality of implementation of innovative strategies of e-health through mass implementation of diversified information systems and automation of daily tasks, through strengthening diagnostic and therapeutic quality, reducing the possibility of error, reducing costs for materials, increasing the degree of system utilization, saving time, etc.. Obstacles to the successful and efficient implementation of service information systems or e-business in general relate to the possible impossibility (for all citizens) of public access to the Internet and ICT technologies in full, but also to the absence and impossibility of generating integrated databases, as well as to the reliability of information and the protection of citizens' privacy and vulnerability to cyber attacks.

It can be concluded that modern and innovative ways of doing business, increasingly impose a comprehensive inclusion of new technologies and information systems, with a high degree of automation of all activities, starting from design to manufacturing products, that is, from business planning to marketing and sales, but also from automation in the health and education sector to the automation of payments, banking systems and state administration systems, which can only be unified and enabled by the CIM concept with a holistic and methodological approach to the business processes and activities of the company, where in addition to technical and technological and economic, sociological, cultural and human resources aspects are equally important. It can also be said that service information systems are developed and function separately from other business information systems and do not only deal with business elements and processes, but their integration defines

the necessary nuances and is needed for the efficient overall business, because it is the quality and level of integration, implementation and exploitation of such systems that bring elements of comparative advantages and strengthening competitiveness of every SME.

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