

INTEGRATED BUSINESS FACULTY - SKOPJE

JOURNAL
OF SUSTAINABLE DEVELOPMENT





Journal of Sustainable Development

Journal of Sustainable Development

Pages: 92

Skopje, Republic of North Macedonia

December, 2019

Publisher: Integrated Business Faculty, Skopje, Republic of North Macedonia

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ECO-CLUSTERS IN THE EU: POLICY SCOPE

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ABSTRACT

Increase of energy efficiency, which is among the targets of Horizon 2020, is to be reached by the development of environmental industries. Eco-clusters development, thus, is important for meeting Horizon 2020 targets. However, there are still significant differences in eco-clusters development between the EU countries. Current paper aimed at outlining the leaders of eco-cluster development and the features of their eco-innovation cluster policy.

KEYWORDS: eco-innovation, eco-cluster, cluster policy

JEL: Q580, Q570

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INTRODUCTION

There are a range of reasons why clusters are important for economic development of the EU countries. They support a fruitful environment for innovation (Brito), play an important role in emerging sectors, considerably contribute to economic wealth of the countries through strengthening competitiveness of the firms as cluster firms benefit from the flows of implicit knowledge and existence of a skilled labor, “cross-pollination” ideas, greater amount of trademarks and patents, more contracted out research, less in-house research than non-clustered firms (Obadić). Eco-clusters have a special role is supporting eco-innovative development of the EU. Eco-innovations provide solutions purposefully planned to diminish the environmental effect of manufacturing, consumption and eliminating activities, even if their primary incentive is to gain benefits and take advantage from environmental concerns(European Commission, “Eco-Innovation Action Plan”). By the European Commission eco-innovations are determined as “all forms of innovation activities resulting in or aimed at significantly improving progress towards the goal of sustainable development, through reducing negative impacts on the environment. Not only technologies, but also products, processes, services and business models” (Peter Czaga).

Increase of energy efficiency, which is among the targets of Horizon 2020, is to be reached by the development of environmental industries (Marta Vovk, *Assessment of Environmental Policy Stringency in the EU*) and stringency of environmental policies (Marta Vovk, *Approaches to Evaluation Environmental Policy Stringency in the EU: Theoretical and Practical Issues*). Eco-clusters development, thus, is important for meeting Horizon 2020 targets. But there are still significant differences in eco-clusters development between the EU countries. Current paper aims at outlining the leaders of eco-cluster development and the features of their eco-innovation cluster policy.

1 The role of eco-clusters in the EU economy

Eco-clusters stimulate innovations in established industries and, consequently, provide useful opportunities to address failures of the market that are preventing the inclusion of eco-innovations in the eco-industries sector and greening the traditional sectors (Denys Braga, Marta Vovk). To the development of a specific territory eco-clusters contribute in the following way:

- Support the development of a well-structured eco-innovation supply chain and stimulate the establishing of the informal and formal networks. Eco-clusters contribute to ensuring that supply chains are more joined, cooperation is formalized, and eco-innovators with services and products are in close cooperation with all the actors of the supply chain;
- address the problem of technological skill shortages;
- facilitate and direct the regional, national and European Funds;
- improve the overall image of the territory;
- promote in a coordinated way, support tourism;
- provide systematic assurance of legislative compliance by helping enterprises meet environmental laws, rationalization of the employment of the resources linked to the environmental management: energy, waste, water consumption, reuse of materials and others;
- facilitate the employment of voluntary certification instruments: standardization of the procedures, legislative update, personal training and others;
- improve overall environmental performance of the territory;
- coordinate the planning instruments, like Municipal Structural Plan and others (Constantinescu and Frone).

2 Eco-innovation cluster policy in the EU

Among the main features of eco-innovation cluster policy of the EU could be distinguished the following (Horbach):

- eco-innovation approaches in some members states are mainly focused in clean-tech industry, while some others perceive it as an aspect that should be applicable to all industries;
- the majority of the member states have incorporated eco-innovations in cluster policy that happens in line with sustainability goals;
- some member states view eco-innovation policy through cluster policy as a strategic goal, whereas some other member states assess benefits from eco-innovations as those which bring additional gains for their industries (Denys Braga).

In the member states that perceive eco-innovations as a strategic goal, eco-innovation cluster policy involves targeting eco-industries and it is usually precisely

stated; the link between eco-innovations and country's economic competitiveness is strong and eco-innovation is considered as a driver in the economy. These countries are usually characterized by a considerable mass in eco-industries and the clean-tech sector and eco-innovations are determined as a center goal in their cluster policy. This is the case of Denmark, France, Germany, Luxembourg, Austria, Finland and Belgium.

The second group of the countries which perceive eco-innovations as a source of obtaining additional gains for their industries are characterized by cluster policies which involve targeting all industries generally. The linkage between eco-innovations and country's economic competitiveness is not strong. The countries of this group often lack eco-industries and the central strategy of their cluster policies does not include eco-innovation. By OECD and Eurostat eco-industries are defined as "activities which produce goods and services to measure, prevent, limit, minimize or correct environmental damage to water, air and soil, as well as problems related to waste, noise and eco-systems. This includes technologies, products and services that reduce environmental risk and minimize pollution and resources" (European Commission, *Eco-Industry, Its Size, Employment, Perspectives and Barriers to Growth in an Enlarged EU*). The countries of this group include Slovak Republic, Romania, Latvia, Poland, Czech Republic, Malta, Greece, Bulgaria, Cyprus, Hungary, Estonia, Lithuania and Croatia.

Ireland, Spain, Portugal, United Kingdom, Sweden, Slovenia, Netherlands and Italy form the third group which position themselves between the two groups described above. These countries belong to this group as they practice cluster policies at the national level only as frameworks in terms of which regional cluster policies are put in place (Sarine Barsoumian et al.). In the Table 1 below we have considered the differences among the EU countries from the point of view of their eco-innovation cluster policy.

Table 1: Eco-innovation cluster policy in the EU countries

Countries	Cluster policy in place	National cluster policy addressing eco-innovation: yes, no, indirectly	National cluster policy approaches: sectoral or horizontal	Number of eco-innovation clusters	Years of activity
Denmark	At the regional level	Indirectly	Sectoral	More than 10	More than 10 years
France	At the national level	Yes	Sectoral	More than 10	Less than 5 years
Germany	Both at the national and regional level	Indirectly	Sectoral	More than 10	More than 10 years
Luxembourg	At the national level	Yes	Sectoral	1-5	More than 5 years
Austria	At the regional level	Indirectly	Cluster policy varies between industries	More than 10	More than 10 years
Finland	At the national level	Yes	Sectoral	More than 10	More than 10 years
Belgium	At the regional level	Indirectly	Sectoral	More than 10	More than 10 years
Slovakia	-	No	-	none	-
Romania	At the national level	No	Sectoral	1-5	Less than 5 years
Latvia	At the national level	Indirectly	Sectoral	none	-
Poland	Both at the national and regional level	No	Horizontal and sectoral	More than 10	Less than 5 years
Czech Republic	At the national level	No	Horizontal	1-5	More than 5 years
Malta	At the national level	No	The main aim in cluster development and support is to enable Maltese companies to internationalize	none	-
Greece	At the national level	No	Horizontal	6-10	More than 5 years
Bulgaria	At the national level	No	Sectoral	none	-
Cyprus	No cluster policy in place	No	-	No eco-clusters in the country	-
Hungary	At the national level	No	Focus on innovation and science	6-10	More than 5 years
Estonia	At the national level	No	Horizontal	1-5	Less than 5 years
Lithuania	At the national level	Indirectly	Sectoral	1-5	Less than 5 years
Croatia	No cluster policy in place	No	-	none	-
Ireland	At the national level	Indirectly	Focus on general innovation and enterprise policy	1-5	More than 5 years

Spain	Both at the national and regional level	No	Non sectoral approach to cluster policy	More than 10	More than 10 years
Portugal	At the national level	No	Sectoral	1-5	Less than 5 years
United Kingdom	Both at the national and regional level	No	Horizontal	More than 10	More than 10 years
Sweden	Both at the national and regional level	Indirectly	Driven by the potential for growth and the ability to meet competitive challenges, across sectors	6-10	More than 5 years
Slovenia	At the national level	No	Sectoral	1-5	More than 5 years
Netherlands	No cluster policy in place	Yes	Sectoral	6-10	More than 10 years
Italy	Both at the national and regional level	No	Horizontal	More than 10	More than 5

Source: developed by author based on Sarine Barsoumian et al. (Sarine Barsoumian et al.)

From the table 1 we can see that the EU countries employ different approaches to organizing national eco-innovation cluster policy. But the developed countries are distinguished by regional and national level cluster policy; in these countries cluster policy does address eco- innovation directly or indirectly; there are more than 10 clusters in developed countries which have been operating for more than 10 years.

3 Cluster mapping as a tool for tracking the EU eco-clusters development

In October 2014 European Cluster Panorama, emerged from the first cluster mapping picture that is based on the analysis of signals about the development of new linkages across clusters and industries, was presented at the European Cluster Conference. Cluster mapping is the process of developing cluster definitions (established on the basis of the types of the companies, service providers, suppliers, producers of final services and products, innovation actors, such as educational and research institutions, financial actors, specialized government agencies, other organizations that provide relevant services or in different ways link the different components of the clusters) and applying them to a particular economy. The result of cluster mapping is a data set of cluster-specific indicators like employment and wages

across specific locations. The first cluster mapping effort was realized by Michael Porter and his team in the U.S. in 2000 (Figure 1).

In 2003-2005, the U.S. model was taken to Europe by the Center for Strategy and Competitiveness at Stockholm School of Economics. The first European cluster mapping exercises were conducted for Sweden, the new EU-10 members, and finally for all European in 2007. Cluster mapping made one of the most considerable contributions by translating the cluster codes from the U.S. SIC classification of economic activities to the NACE classification used in Europe, overcoming many incompatibilities. The developed by the European Union cluster initiatives have become power tools for the analysis of the EU countries progress towards the development of industries and clusters. Cluster mapping (Figure 2, Table 2) tool reveals that Germany is the leader in eco-clusters performance. Among other countries demonstrating well developed eco-clusters in environmental industries are Sweden, Finland, Denmark, Ireland, the Netherlands.

Table 2: The EU top locations in environmental industries

Country	Region Name	Largest City	Employment	Location Quotient	Average Wage, PPP	Annual Growth	Gazelle Employment share	Stars
Germany	Rheinhessen-Pfalz	Mainz	59 964	1.85	57 684	-1.7%	0.3%	3
Germany	Tübingen	Tübingen	51 550	1.76	53 768	-0.1%	0.6%	3
Germany	Schwaben	Augsburg	46 987	1.63	52 978	-8.4%	0.8%	3
Germany	Freiburg	Freiburg	57 441	1.56	52 702	2.6%	0.4%	3
Germany	Stuttgart	Stuttgart	116 852	1.52	58 768	-0.3%	1.0%	3
Germany	Mittelfranken	Nürnberg	46 137	1.48	55 143	-4.1%	1.2%	3
Germany	Oberpfalz	Regensburg	28 207	1.45	55 853	3.7%	4.6%	3
Germany	Arnsberg	Dortmund	77 357	1.42	53 668	1.9%	1.5%	3
Germany	Düsseldorf	Düsseldorf	112 407	1.37	59 151	4.3%	1.0%	3

Source: author based on Christian Ketels and Sergiy Protsiv (Christian Ketels and Sergiy Protsiv)

According to European Cluster Observatory approach to assessing the performance of eco-clusters, it is measured through so called “stars”, indicators that reveal the existence of critical mass depending upon the cluster’s size, the degree to which it is specialized and the extent of productivity and growth. A cluster gets one star for being in top 20% in Europe along each of the four dimensions: specialization, size, growth and productivity.

Cluster star - specialization (Location Quotient): ratio of the share of the industry in employment in traded industries of the region and the share for all of European region. The localization quotient is calculated as the share of the industry of total employment in a specific region to the share of the industry of total employment in all analyzed countries. If a localization quotient is 1, then the region is not specialized in the given industry. If localization quotient is 2, then the industry is represented by a 100% bigger share of employment in the region than the share of the industry of employment on the level of all the regions. This demonstrates that the specific region is specialized in the industry.

Cluster star - size: Number of employees in full time equivalent units: total number of employees in full time equivalent units computed as the aggregate number of employees in different sectors. If the number of employees in a specific cluster does not fall in top 80% inside a sector, the cluster then is not given any stars to avoid the appearance of very small insignificant clusters.

Cluster star - growth: growth is computed as the average annual growth in employment between 2008 and 2012 or the nearest available years to these.

Cluster star - productivity: Average wage per employee (in full time equivalent units) in a specific region.

CONCLUSION

Current research has revealed that Germany is the leader in eco-clusters performance. Among other countries demonstrating well developed eco-clusters in environmental industries are Sweden, Finland, Denmark, Ireland, and Netherlands. The differences in eco-innovation cluster policy outlined three groups of the EU countries: the first group of the countries which perceive eco-innovations as a strategic goal, eco-innovation cluster policy involves targeting eco-industries and it is usually precisely stated; the link between eco-innovations and country’s economic

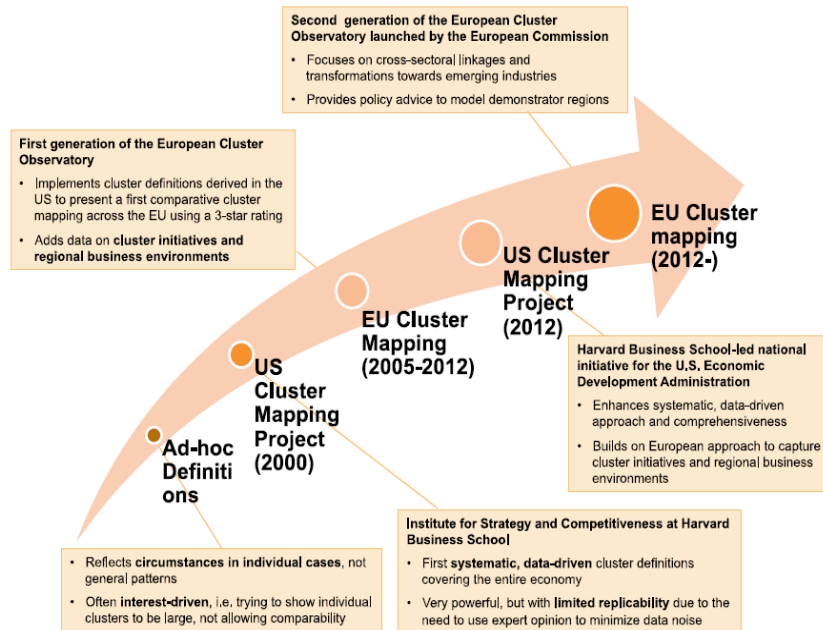
competitiveness is strong and eco-innovation is considered as a driver in the economy. To this group Denmark, France, Germany, Luxembourg, Austria, Finland and Belgium are referred. The second group of the countries which perceive eco-innovations as a source of obtaining additional gains for their industries are characterized by cluster policies which involve targeting all industries generally. The linkage between eco-innovations and country's economic competitiveness is not strong. The countries of this group include Slovak Republic, Romania, Latvia, Poland, Czech Republic, Malta, Greece, Bulgaria, Cyprus, Hungary, Estonia, Lithuania and Croatia. Ireland, Spain, Portugal, United Kingdom, Sweden, Slovenia, Netherlands and Italy form the third group. These countries practice cluster policies at the national level only as frameworks in terms of which regional cluster policies are put in place. Generally, the developed countries of the EU are characterized by regional and national level cluster policy with more than 10 clusters and more than 10 years of operating.

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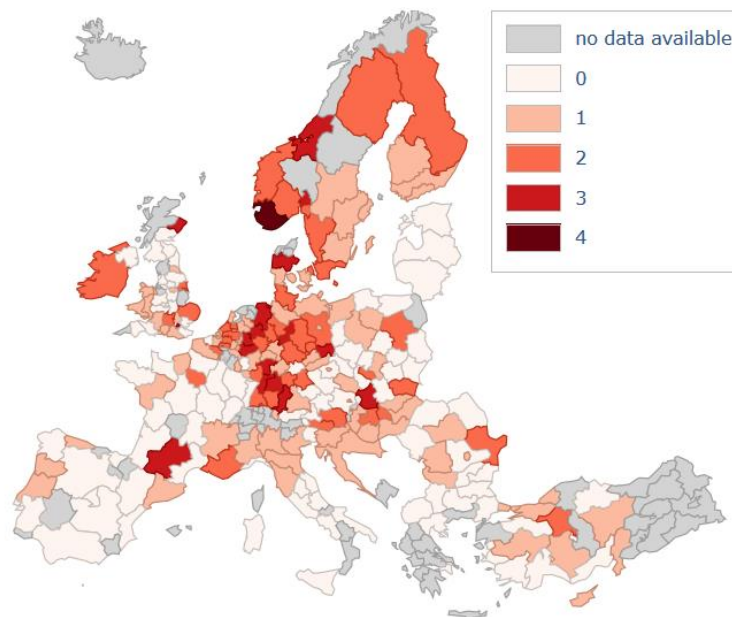
APPENDIX

Figure 1: The evolution of the cluster mapping methodology



Source: European Cluster Observatory Report (Christian Ketels and Sergiy Protsiv)

Figure 2: The EU clusters performance in environmental industries



Source: author on the base of Cluster mapping tool (European Commission, “Cluster Mapping Tool”)

**The numbers in the upper right corner indicate the quantity of stars got by clusters in every specific region*

ACKNOWLEDGMENTS

Some parts of the paper have been presented at the 3rd International Scientific Conference – EMAN 2019

MANAGEMENT OF LIFE AND ENVIRONMENT QUALITY IN MODERN TECHNOLOGIES

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ABSTRACT

Technology and science are important determinants in the quality of life of modern man. As conditions and lifestyles change, so will these dimensions change and adapt, taking on an even more dominant role. In order to make human life better, democratic problem-solving and reconciliation with nature, which are closely linked to the knowledge and technologies that this new knowledge brings, is necessary.

The paper will give an overview of the basic concepts of integration of modern technology with new ways of being, in the present and in the future. In addition to other revolutions and revolutionary discoveries which recorded every period of the development of civilization, the most important is the technological revolution. Economic progress is directly related to the advancement of science and technology, and since it carries with it environmental issues, the authors advocate the protection and safety of the natural environment in terms of raising environmental awareness and emphasizing the importance of economics, modern technology and ecology. Healthy environment becomes imperative for a healthy future and healthy generations. The sustainability of human civilization must have three dimensions, economic, environmental and social. New technologies increasingly occupy an important place in improving the protection of the natural environment, and thus raising the quality of life. Major development of science and technology is a priority of the current generation and a real chance for survival and long-term future development.

KEYWORDS: Technology, Protection, Environment, Quality, Sustainable development.

JEL CLASSIFICATION: F64

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1. INTRODUCTION

In order to improve the quality of his life, and to understand the purpose of existence, a man from his beginnings tends to imitate nature and create material and spiritual goods. By developing mental abilities and by using nature and natural laws, he has come a long way on his development path. Modern world has been faced with the need of global, common responsibility for development in accordance with the needs of people and the nature (Ilic et al., 2017). In addition to other revolutions and revolutionary discoveries which recorded every period of the development of civilization, the most important are the industrial i.e. technological revolutions. The Industrial Revolution marks a significant historical milestone. It has affected almost every aspect of life in some way. Specifically, the average income and population size began to manifest previously unseen level of constant growth. Some economists believe that the main impact of the industrial revolution is that the standard of living began to grow consistently for the first time in history, although others (economists) claim that there has been a significant improvement in the late 19th and until the 20th century (Lucas, Robert E., Jr., 2002) (Feinstein, 1998) (Szreter & Mooney, 1998). The technological revolution and information-technological paradigm with a complex of scientific activities, knowledge and information as a core in the center, have changed the basics of business activities in the global terms and created preconditions for a new economic and social context (Milivojevic et al., 2012). Knowledge Society is most often referred to as a new social and economic order. It is not uncommon to hear expressions such as information society, digital economy, network economy, and e-economy. Technological revolution has gone through several stages. The first one refers to the radical impact of microprocessors on computer activity and communications. Thus, due to a large demand for personal computers, two giants were formed in the 1980s – Intel and Microsoft. They have developed new ecosystems, including many new high-tech companies that have produced complementary products. The second stage is characterized by the 1990s when network technologies were acquired for business, educational and entertainment activities. Cisco Systems is a gigantic company that marked this period globally with the development of a new ecosystem for many high-tech companies. The third stage of technology development encompasses mid 1990s and an explosive growth of internet. The internet has changed the model of understanding the potentials of information and business in general at the beginning of the 20th century. New economic disciplines, new

technology, new educational and scientific institutions dealing with internet issues are being developed (Milovanovic, Arsovski, 2009)(Mladenovic, Jovanovic, 2007). The explosive growth of the number of networked computers and internet users today surpasses all predictions. Business activity at the beginning of the 21st century took on quite different characteristics. At the core of these activities are intangible and invisible resources, or invisible assets. Business is under dominant influence of modern technologies. New economic values are being achieved and they are achieved faster because business activities have also become faster by the use of new technologies. On one hand, the global trend of information technologies represented a real progress of the modern man and led to unbelievably rapid spread of information and connection between the most distant parts of the world. On the other hand, however, the man in his intellectual development has forgotten the fact that he is only part of nature and that he is a living being, like all other living beings. The man is biologically more vulnerable in the modern world than he has ever been before.

Having overlooked the fact that we are only part of the great universe, dust on one among million galactic paths, the humanity, with its activities, has begun to cut the branch on which it sits. Large climatic changes which repeat more often than before, polar warming, natural disasters such as stormy and devastating winds and precipitation that cannot be affected, depletion of non-renewable resources, have led the mankind to the following questions: How to live with it? Is there any hope to get things in order? Can nature be balanced? (Kotlica, 2007). Trend of sustainable development is present in the world for a long time, as the trend of sustainable economy, ecology and social development. At the global level, the green economy is seen as an economy in which economic decisions and innovation allows the company to use resources efficiently, improving the welfare of people in an inclusive way and preserving the natural systems that sustain the world and mankind (Ilić, Mihajlović, 2014).

2. THE ENVIRONMENT AND SUSTAINABLE DEVELOPMENT

For a long time, human society paid no attention to the nature and the possibility of its pollution or depletion of its resources. As we have recently, especially in the last couple of years, witnessed the natural events of catastrophic proportions, resulting from a disturbed balance in nature, it is necessary that the whole human activity be focused on the one that will not further jeopardize the environment, that is, will not disturb the

natural balance. Non-renewable resources (coal, oil, ore...) are decreasing and it is necessary to manage them sustainably and save them to the maximum extent. The new term of a developmental and sustainable strategy of a society thinking of preserving future generations, can mean "to be the first in new aspects of obtaining energy and to use renewable energy resources in the right way and for good purposes."

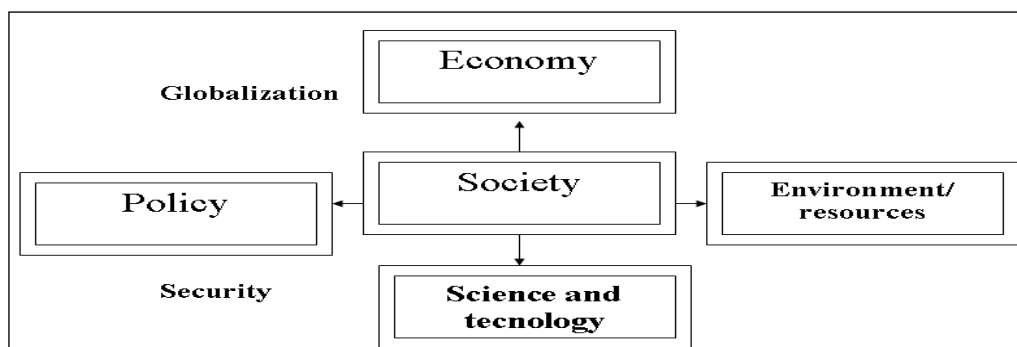
In addition to the right use of energy resources and fair treatment of other natural resources, it is necessary to pay attention to the possibility of using modern technologies for the purpose of environmental protection. Consequently, the quality of life can also be improved. Ecology has long been neglected in terms of its consideration in regard to social production. By the emergence of serious environmental problems on the earth, brought about by human activity and economies of scale, ecological goals began to be taken into account. The philosophy of modern society understands the concept of sustainability as a completely new development strategy. Sustainable development is linked to environmental protection, but also to planning of social development, as well as consideration of ecological and political situation. Sustainable development involves caring for the whole living world on planet Earth, that is, taking care of the preservation of its natural systems, including the harmonization of modern human activities (Ilic, 2016). Coordination of activities is a process in which, along with the economic side of industrial production, the ecological side is also observed, that is, the impact that human activity has on the natural environment. The problem of sustainable development has been discussed at the highest global levels, as evidenced by various documents of primary importance for the sustainability of the whole community. The UN document titled "Report of the World Commission on Environment and Development: Our Common Future", or the 1987 Report on Common Future, compiled by the World Commission on Environment and Development, is one of such documents. In the same year, Gro Harlem Brundtland outlined in this Report the basic recommendations of sustainable development, which include long-term ecological strategies for sustainable development up to year 2000 and beyond, as well as ways of protecting the environment which can be achieved through better cooperation between countries at different phases of economic and social development (Ilic, 2017). Although there is no generally accepted and unique definition of sustainable development, the one most cited is from the Report on Common Future: "Sustainable development is development that meets the needs of the present, without compromising the ability of future generations to meet their own needs." By the

second definition, sustainable development implies a balance between resource consumption and ability of natural systems to meet the needs of future generations (Stojanovic, 2012).

3. SCIENCE AND TECHNOLOGY IN THE MODERN SOCIETY

The main factors for the development of civilization are science and technology, while they will be even more important in the future. Milivojevic et al. consider that there are four axes of development, and that the main axis is the environment that is, resources (Kotlica, 2007). Graphically, this can be seen in Figure 1. The central part of the picture is the society, while other flows are related to economics, politics, science and technology, as well as the main factor, the natural environment.

Graph 1. Key factors of society/civilization development



Source: (Stamenković, 2014) – Processed by: Ilic, Stojanovic

On the amount of resources, as well as the quality and security of the environment, all other trends in science, economics and politics will depend. Looking at the development of today's man, with the prognosis of some nearer future, one can create an image of the quality of people's lives and the development of human community for a certain period of time in advance. Current quality of life differs from country to country, because science and technology on a global scale are unevenly developed. Some studies determine or anticipate trends of future development called "global technological revolution", which has technically and economically started in the most developed countries and which is characterized by the creation of strong links between science, technology and production (Stamenković, 2014). New technologies include personalization of medicine, genetic modifications (with the aim of controlling certain diseases), computer research and testing of drugs, biomathematics using bionanotechnologies, installation of sensors and computer devices in commercial goods,

materials with improved properties, small and portable electrical systems, mass production of organic electronics, sophisticated sensor networks through large bases of personal and medical data to a widespread package of information and communication technologies, including wireless internet connections. It is important to note the development of a system for secured information transfer, as well as the development of clean/green energy sources, using sun, wind and other natural resources that do not have a harmful impact on the environment. The development of technology to mitigate global warming's also expected. By developing scientific fields of Biotechnology, Nanotechnology, Energy, Information and Communication Technologies, as well as the Military one, can we expect even greater development of the quality of life in future? (Philip, 2002). Biotechnology anticipates the decryption of the human genome, as well as solutions for many human genetic diseases. By developing new generations of medicines, it will eliminate diseases that create barriers for a longer life expectancy. Biotechnology as a science occupies a leading position also because of the ability to improve the performance of human health. By using computers and new technologies, genes of all living beings can be redesigned, and one may also find a way to maximize lifetime by cloning organs. The development of nanotechnology will provide the man with various benefits brought by highly modernized and sensitive chemical and biological sensors. So it can be expected that a man with the help of nanotechnologies will have his personal medical supervision in the future. Energy and energy industry certainly play a major role in the development of modern society. This is especially because the need for energy in the world is big and increasing. Traditional or primary energy resources that include coal and oil will not be sustainable in the future, as they are scarce, while their use is causing negative impact on the environment. Clean, renewable energy resources, such as solar, hydro and oleic energy (wind energy), will be essential for future productivity. Energy security will be one of the major issues of this century. The 21st century is the century of globalization and all the negative and positive effects it brings along. In addition to conflicts, peoples will be forced to cooperate, as well as to interpersonal corporation. The development of new and better materials is also expected in the future. They can include various energy-absorbent fabrics, as well as optical fibers, and clothing that adapts to external environmental conditions. The main future branch of production will be green production that does not pollute the environment with its products and business activities. The development of information communication technologies will be seen in

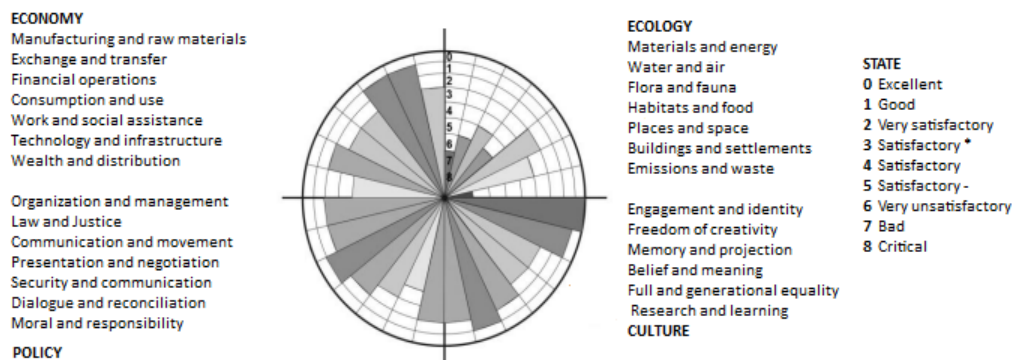
the wireless internet which will cover all parts of the world, and the transfer of information will be instantaneous. Laptops will also be expected to have an add-in for the control of medical devices, while large databases with personal information and medical documentation will be widely distributed, so that the information will be available to the user on-site. Certain small devices will also be used to store large amounts of data, and therefore will improve the way you search in the image, text or video. It is also possible to develop robots that would look like and behave similarly to people, while the development of micro cameras will improve security of people movement (Kotlica, 2007). In addition to all the benefits brought about by the development of technology, the most dangerous development will still be reflected in military technology. In this regard, it is possible to expect the development of new generations of weapons, such as cosmic weapons. There are now widespread satellites, while in the coming decades the same will be used for military purposes, with the objectives of reconnaissance, warning, communication, weather forecasts, etc. Nuclear weapons will be improved, and biological weapons will be used, which is the most dangerous. Artificially obtained viruses and microorganisms are already in widespread use, so the fact that their future development will be even greater is imposed. A new way of using genetics and gene therapy will be developed, but serious new infectious diseases will develop, too. A man, or, rather a soldier of the future, can also develop acoustic weapons which are programmed in such a way that by their strong sound, as many people as possible are killed. Energy weapon belongs to the future of warfare, and it is based on the way to disable the flow of energy to the enemy by means of electromagnetic radiation. In addition to the above mentioned, a series of modern devices for man destruction will be developed, including weapons for mass panic, as well as weapons designed to operate on all fronts, both physical and intangible (internet, electronic media). Devices that use ionosphere in military purposes will be based on the patents and inventions of Nikola Tesla and on the HAARP project (Nenadic, Bogićević, 2008). HAARP is an acronym of High Frequency Active Auroral Research Program, which in translation denotes a program for active aurora research with high frequencies. It is made up of a set of antennas that emit radio radiation. These devices are examining the ionosphere layer, above the ozone layer, at an altitude of 85-600 km. The sun's rays are acting on it and by dissolving it create free ions and electrons. After some time of free movement, the particles will reunite in a new atom. In this cyclic repetition, a process occurs in which the high frequency solar rays reflect and return to

earth. HAARP functions on this principle with the aim of achieving the highest possible quality of radio communication (HAARP, 2015). Although some scientists claim that HAARP cannot affect weather conditions because it affects several layers of the atmosphere, this device can certainly be regarded as dangerous for violating environmental quality. HAARP can also represent a form of conflict in modern warfare, with unarmed means, and these conflicts are in the communication sphere (Randjelovic, 2008). However, Parliament's Subcommittee on Security and Disarmament held a discussion on HAARP in Brussels on 5th February 1998. In the parliamentary report of 14th January 1999, HAARP was characterized as a weapon system with a major impact on the climate. Accordingly, great concerns have been expressed about its legality under international law, its far-reaching environmental impact, and the environmental and ethical implications that an international independent body should examine before any further research and examination (European Parliament, 2015).

ROLE OF MODERN TECHNOLOGIES IN SUSTAINABLE DEVELOPMENT

Since the outbreak of the global economic crisis and clearer causal links between human activities and climate change, the issue of sustainable development has become an increasingly important topic. As it is well known, the initial illustration of the concept of sustainable development is based on three basic elements: economy, society and ecology. However, this concept has adopted a much more complex form recently. According to the UN Global Compact Cities Program for achieving the overall concept of sustainable development, it is necessary to include other components in the concept (Figure 1) (Babic et al. 2014). These components relate to the economic, environmental, political and cultural situation in a country and are composed of a number of factors, as shown in Figure 1. These factors are ranked by numbers 0 through 8, where 0 represents the critical state of the given factors. Depending on the assessment of the factors, it can be concluded what the situation of economic, environmental, political and cultural sustainability in the country is. As the development of mankind has been achieved by the abilities of human species to think and engage in activities, so will the realization of sustainable development depend on the man's scientific activities in different domains.

Figure 1. Circles of sustainability



Source: (Babic at al. 2014)

Accordingly, in order to establish a lasting balance with nature, many innovative solutions are needed. This can only be achieved by the appropriate use of scientific resources in all segments and all stages, as well as with the use of modern technologies. Some of the major domains in which innovations are expected to contribute to sustainable development are technological innovations of products and services, which will increase competitiveness on the market with a significant / complete elimination of undesired impacts on the environment (Babic at al. 2014). Keeping in mind global effects of climate changes, as well as growing number of ecological catastrophes all around the world, the Kyoto protocol question becomes more and more significant. The necessity of implementing this document is quite obvious (Stojanovic, Djordjevic, 2017). When it comes to climate change, the question arises as to what modern information and communication technologies (ICTs) can do in the sphere of climate change? Going in that direction, we must start from the necessity that for each device we use, we need to provide power, which affects energy consumption. And precisely from this fact, the challenge posed before ICT in modern world trends is how to help world economy become sustainable? Bearing in mind the importance of sustainable development for the whole mankind, this challenge has become and actual topic in many of the most extensive works and at a recent meeting of world leaders at the summit in Rio. One of the most famous studies in this field is the GeSi study published by the Global e-Sustainability Initiative (GeSi), supported by British Telecom, Deutsche Telekom, Ericsson and Verizon. The study states that the more intensive use of online activities (online shopping, teleworking, etc.) can contribute to the reduction of carbon dioxide (CO₂) emissions, and therefore significant energy savings. "Green markets and green products today are

characterized by rapid growth and development, which is particularly related to market growth of CO₂ emissions” (Stojanovic, 2016). Consequently, in order to explore the connection between the use of broadband internet and energy savings, a study was carried out under the label ‘Measuring the Energy Reduction Impact of Selected Broadband-Enabled Activities Within Households’. Within the study, eight daily household activities were explored, which were enabled or enhanced by the presence of broadband internet access. As part of the study, numerous activities were carried out remotely, so that the internet was used as the primary source of information and news, for online banking, e-commerce, streaming of multimedia files (music and video), electronic education, digital photography and communication (via e-mail and in other ways). It was concluded in the study that with the ‘reasonable acceptance’ of the eight activities listed by six major countries in which the study was conducted, they would achieve a net energy savings of as much as 2% of the total energy consumption. The equivalent of the savings that the USA would get in this way would be 336 million barrels of oil annually. On the other hand, France, Germany, Italy, Spain and the United Kingdom would save 164 million barrels of oil, which is all equivalent to 2% of annual energy consumption. And finally, the general conclusion given in the study reads: “Total savings may seem small in relation to total consumption, but this is only because the eight activities represent a very small part of the economy” (Benchmark, 2012). In addition, the study states that the development of ICT enables changes in everyday practice at different levels. In this way, ICT development is a step forward towards achieving sustainable development and creating more energy efficient activities of the entire society. As highlighted in the study, in some countries, the mentioned activities yielded from 83% to 86% of energy savings in certain segments of the households. For example, the adoption of ‘remote’ habits brings benefits in terms of cost savings, less dependency of individual products, reduced driving needs and more time for family and friends. The areas with the least savings were online informing and e-education. In these cases, household members were least prone to changing habits, and activities that enable broadband access to internet were actually used to supplement ‘old practice’. The study itself leans on the study published by GeSi in 2008 under the name “SMART 2020 study” (The Climate group: SMART 2020). The conclusion of the study is that ICT combined with the massive use of broadband internet connections can save up to 15% in global CO₂ emissions, and therefore can bring up to 600 billion euros of savings by 2020 (Majkic,

2012). In addition to the papers on this topic, ICT issue has become current at the summit of world leaders in Rio de Janeiro, organized by the United Nations. One of the most important topics was certainly a debate on sustainable economy. In support of this, they discussed about global potentials of social media and technology that could enable sustainable economy, encourage innovation and provide a better future for the whole world. Hans Vestberg, CEO of Ericsson spoke about this: "Regardless of whether we are talking about climate change, energy consumption, poverty or natural disasters and catastrophes, technology has the potential deal with every kind of challenge that we are facing, all with the goal of achieving sustainable development". Ericsson has dedicated itself to the current topic, as proved by its projects, among which a lot of attention gained the initiative for more efficient operation in the humanitarian sphere, as well as the introduction of mobile devices that allow refugees to search for missing members of their family. That this gave results shows the data of 120,000 refugees registered on the platform. In addition, a partnership with the World Food Program was announced at the summit, where Ericsson will participate with its employees as volunteers within the Ericsson Response Program. Of course, it was inevitable to talk about technologies, social networks, and the like. Ericsson sees there a great potential, especially in combination with the data that have been revealed, and which say that the number of smartphones and mobile broadband subscriptions will reach three and five billion by 2017. In addition to the above, at the summit, most attention was drawn to the report submitted by Chairman Mark Westberg on behalf of the Broadband Commission for Digital Development. It suggests that broadband is actually a bridge linking ICT with efforts in response to climate change. As pointed out, the goal of the report was to raise awareness of the key role of ICT, especially broadband networks, in creating a sustainable environment and economy, and to emphasize the importance of public-private partnerships. Leaning on the 2011 agreement, the report highlights the importance of the solutions that have the capability of transforming the whole society, and which are enabled by broadband internet access.

Therefore, in today's economic climate, societies must evolve towards new growth with the application of the so-called "green" solutions that can contribute to achieving goals of sustainable development. The most important conclusions and recommendations of the report are the following (Majkic, 2012):

- Lead with a vision: adoption of long-term national broadband plans and strategies based on universal availability and accessibility, open markets and innovations, with goals related to climate change;
- Convergence: ICT convergence and policy formulation in line with the policy of developing energy, health and education sectors;
- Ensuring security in the domain of regulation: regulation and rules must be transparent in order to ensure conditions for secure investments in broadband;
- Be an example: encourage cooperation between ministries and integrate decision-making in order to synchronize goals in the field of climate change, government regulations, digital agendas, and the like, and send clear messages to the market;
- Flexibility: identify and remove regulatory barriers that hinder development, research and investments in rapid changes in ICT broadband sector and infrastructure and solutions that reduce CO2 emissions;
- Enable stimulation: encourage the acceptance of CO2 emission solutions and support market changes by directly stimulating the desired consumer behavior;
- Market building: invest and build stable pilot projects so as to demonstrate benefits and efficiency of broadband;
- Partnership formation: promote connectivity through public, private and non-government sectors and industries, in order to form partnerships and joint visions of common interests and goals;
- Standardization: develop measuring systems and common standards for calculating the impact of ICT on the environment and other sectors – from individual products to entire systems, from ordinary households to large cities and nations;
- Share knowledge and raise awareness: actively share new knowledge and project conclusions, best practice experiences and learn from the mistakes.

Having in mind the above, the tendencies of movement in contemporary society point to the necessity of much faster and more aggressive acceptance and development of ICT technologies.

On the other hand, new technologies have imposed the necessity of membership in a network that has linked the whole of mankind and thus forced communities to accelerate the development and application of ICT technologies. Thus, a new economy based on new technologies has brought a number of qualitative and quantitative changes.

So, all these changes have transformed not only the structure, functionality and rules in an economy, but also the way of life, by introducing a new principle, the so-called principle of the “quality of life”. That is why many countries, which have already made significant progress towards the development of network economy, have the need, but also the task, to continue investing in the development and implementation of ICT (Djordjevic, 2012).

4. CONCLUSION

Starting from the fact, that exceeding the limits of endurance of the natural system has led to an ecological crisis in the world, the paper points to the importance of modern technologies in enhancing the quality of life and the environment. The quality of life is a multidisciplinary area that requires equal participation of all scientific fields. On the other hand, technological development has led to the accelerated development of the individual and the human society as a whole. In the globalization conditions, science and technology impose themselves as an equal dimension of the quality of life and sustainable development. However, numerous environmental debates show that the problem of environmental degradation must be seen through a comprehensive understanding and definition of a new role for all the actors and participants in designing policy and strategy of research and development processes. Consequently, the ultimate goal and measure of economic growth must be to improve the quality of life of all the citizens in the world. Starting from the fact that endangering the environment is not the only problem in modern development, a new approach must be based on a new perception of science and technology. Therefore, no matter how much we continue to believe that future development is in the function of the development of science and technology, the need for reevaluation of the possible ranges within the existing development paradigm is being imposed.

The goal of creating a new development paradigm implies that science and technology are in the function of optimizing the quality of life and not in the function of maximizing economic efficiency. That is why modern mankind is facing global challenges of how to improve the quality of life and preserve current natural resources for future generations. Some of the main domains in which innovations are expected to contribute to sustainable development are technological innovations of products and services, which will increase market competitiveness with significant or complete elimination of

undesired impacts on the environment. This can only be achieved by appropriate use of scientific resources in all segments and stages, as well as the use of modern technologies. In the end, the trends of the modern society show the necessity of a much faster and more aggressive acceptance and development of ICT technologies.

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ACKNOWLEDGMENTS

Some parts of the paper have been presented at the 3rd International Scientific Conference – EMAN 2019

CUSTOMERS' CONSTRAINTS TOWARDS ONLINE BANKING TRANSACTION: A LITERATURE REVIEW

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ABSTRACT

The internet and its accompanying technologies regarding the e-bank industry's products and services have been diversified in relations to customers' needs and desires. In spite of improved quality of service delivery on banker-customer transactions facilitated by the increasing levels of adoption and use of new technologies, important variables that inhibit customers in their quest to engage in successful online banking transactions have been silent in the context of some emerging economies. Against this backdrop, the focus of the study was aimed at reviewing the antecedents and investigating the barriers of internet banking adoption and acceptance from an emerging economy perspective. Document Analysis (DA) as a research technique for executing the general aim of the study was employed. The study presents and highlights the leading constraints of online banking transaction adoption, notably; Infrastructural constraint, Behavioral Influence, Social Influence, Operating (Transaction) Cost, Perceived Credibility, Performance Expectancy, Effort Expectancy, and Perceived Knowledge were discovered as online banking customers' constraints. In theory, the study adds up to broaden the scope of internet marketing in banking from the perspectives of consumer behaviour in online banking transactions. The practical knowledge will help practitioners and industry players in the banking fraternity to strategize and repose confidence in customers in their quest to engage in online banking transactions.

KEYWORDS: Customers' risk, online banking transaction, technology adoption, emerging economies

JEL CLASSIFICATION: M2; M30; M31

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1. INTRODUCTION

Online banking transactions have grown at an exponential rate due to the high intensity of competition among banks and non-banking institutions. The phenomenon in today's technological era has attracted keen interest by scholars and industry players in relation to the effectiveness and efficiency characterized by service delivery in service organizations (Ernst & Young, 2011). For the past decade, internet banking has appealed to several distinguished stakeholders including bankers, customers, regulators, among others. The subtle issue has been triggered mainly by factors such as high efficiency, improved service delivery, low transaction cost, less time consumed, among others (Dauda & Lee, 2015). Internet usage from a perspective of technology acceptance or adoption comprises the desire and possibility to acquire and use any invented device for maximum benefit to the user. Technology adoption over the years and till now has been justified by pioneer scholars (Venkatesh, Morris, Davis, & Davis, 2003) and had been echoed in recent works of Aliyu, Rosmain, and Takala, (2014); Legris et al., 2003; and Saleem and Higuchi, (2014) where these studies stressed some factors why developing nations have fallen behind in their quest to develop. According to these authors, these group of countries have been characterized by low interest in innovation/technology adoption, outdated technologies with low productivity, low-quality of product, low level of technical know-how, less investment in technology, among others.

With innovation as a paradigm shift, the interaction of the organization's stakeholders has taken a new interface and this new development has triggered the proliferation of technology-based systems typically in the service industry with the banking sector as an example (Martins, Oliveira, & Popovič, 2014). However, many industries have capitalized on this opportunity in developing several alternatives in their service delivery channels with the motive of improving customers' satisfaction while ensuring growth and continuity. In the developed world, for instance, the adoption or acceptance of internet usage and the accompanying technologies is on the rise. According to Thambiah, Eze, Tan, Nathan, and Lai, (2010) the banking sector has been utilizing adequate information services for administration purposes and not limited to their internal operations, but to improve product/service and to enhance services to customers. A related debate from Zhu and Chang, (2014) posited that

consumers are interested in the usefulness of the information and the ease with which technology (invented device) could be applicable to harness information.

Also, studies by Martins et al., (2014) investigated and found that the adaptors of the internet (technology) in the banking sector have a lower inclination in exiting from the bank; however, they are highly motivated to indulge in banking activities such as new product acquisition, and retaining high assets and liability balances. Thus, the maximum use of this information communication technology (ICT) by banks and their customers leads to better satisfaction between both parties. In recent times, banks have executed service delivery technology as a process of improving the traditional delivery system which is done by the bankers. Meanwhile, service delivery technology could only improve firms' performance via customers' adoption or acceptance (Thambiah et al., 2010). In view of this, online banking could be compatible with the human environment or society where there exists a potential solution to suppress unforeseen constraints in the future.

Previous studies have dealt extensively with online banking transaction adoption or acceptance and mostly they are concentrated on factors that influence customers' adoption or acceptance and the intention to make use of those services. However, in spite of the growing discussion of online banking service adoption in the literature, an insufficient attempt has been made to examine the customers' constraints towards online banking transactions in the context of emerging economies. Hence, the researchers asked the following questions in the present study: (1) What are the factors impeding the consumers' willingness to engage in online banking transactions? and (2) Is there any proposed model of consumers' constraints associated with online banking transactions in an emerging economies' perspective? Therefore, the aim of this paper is to discover and propose a consumers' constraints model for online banking transaction adoption in an emerging economy. The study offers practical knowledge to banks and other industry players to understand the nature and characteristics of online banking transactions that are best suited for adoption or acceptance by customers of banks and other financial services institutions. Also, the reviewed work will enable practitioners to create sound policies and strategies that could attract and retain both experienced and new customers in their quest to engage in banking services via online banking medium. Also, the theoretical implication of this

article would widen the scope of internet marketing in banking regarding the behavior of consumers in the online transaction. However, the organization of this paper is as follows: the immediate section denotes the theoretical background and justification of selected constructs and attributes, followed by the research methodology, and then the conceptual framework. Finally, we presented both theoretical and practical implications of the study, and concludes with research limitations and suggests future areas of research on the subject.

2 THEORETICAL BACKGROUND

2.1 Mixed Adoption model (MAM)

Technology acceptances or adoptions consist of several information service theories that are contained in models and how these models could be accepted by users of a particular technology (Fusilier & Durlabhji, 2005; and Williams, Rana, & Dwivedi, (2015). Meanwhile, the rapid growth of information service and technology acceptance adoption has been researched through several models, but these studies have had varied interpretations and conclusions. Again, the various models used in reviewed literatures offered some conclusion such as understanding the antecedents of technology acceptance, in-depth knowledge on technology acceptance at both individual and organizational levels among others (Dauda & Lee, 2015; Martins et al., 2014). However, these theories (noted as mixed adoption model) from previous studies suggest that when users are offered with new technology, there are a number of factors that influence the acceptance and usage of such facility (Mathieson, 1991). Many scholars have studied different aspect of new technology from a number of theoretical perspectives on identifying and explaining the relationship between user belief, attitude, perception and intention, addition to the Theory of Reasoned Action (RA) (Ajzen & Fishbein, 1980; Fishbein & Ajzen, 1975), Technology Acceptance Model (TAM)-(Venkatesh, & Davis, (2000). Theory of Planned Behavior (TPB)-(Mathieson, 1991; Norman & Smith, 1995), Motivational Model (MM)-(Igarria, Parasuraman, & Baroudi, 1996), Innovation Diffusion Theory (IDT) -(López-Nicolás, Molina-Castillo, & Bouwman, 2008; Norton & Bass, 1987), Social Cognitive Theory (SCT)-(Bandura, 1989, 2001), and Unified Theory of Acceptance and Use of Technology (UTAUT) - (Im, Hong, & Kang, 2011; Yu, 2012; Venkatesh & Zhang, 2010). Among these theories, the behavior is viewed as a set of beliefs attached to technology as well as a set of emotional

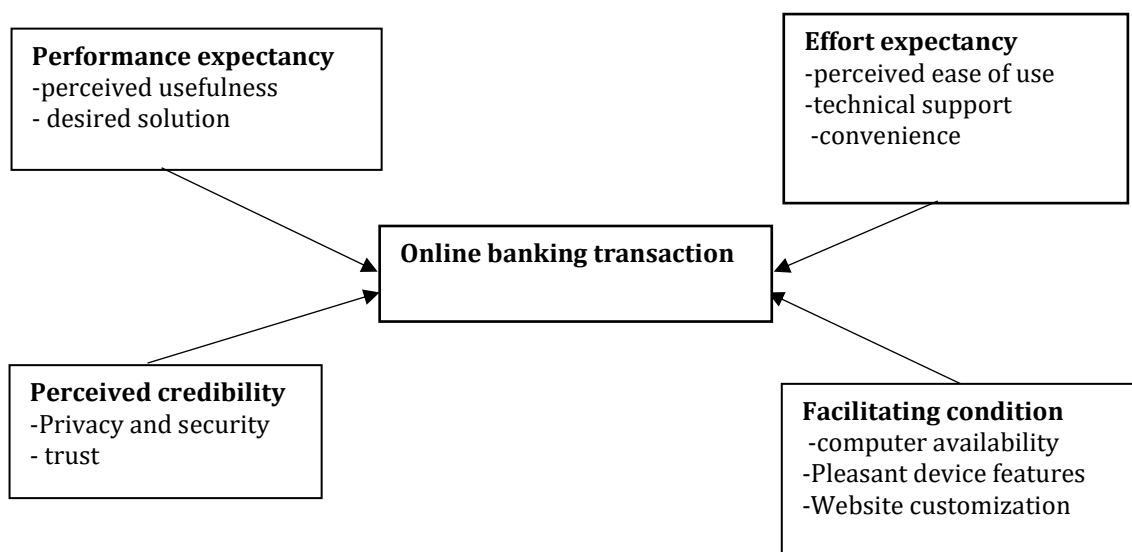
responses to the behavior (Dauda & Lee, 2015), some of the most popular theoretical models are TPB, TAM, TRA, and UTAUT.

In spite of the aforementioned adoption models, however, the most appropriate and generally accepted models by scholars regarding the present study (theme) are the TAM and UTAUT. This is because, the two models have consistently been extended widely to decompose the multidimensional constructs of the models (Davis & Venkatesh, 1996) to be understood by academic and practitioners and above has demonstrated the clarity and validity of those construct. For example, this model (TAM) has been widely used in the spheres of the internet (information technology) acceptance or adoption (Davis, 1993). The established interconnections between the behavioral intentions of users in their quest to accept or adopt new technology show the extent or the significant relationship between the two constructs (thus, behavioral intention and use of technology). According to Tan and Eze, (2008), TAM was modeled to predict information technology (new technology) by considering the perceived usefulness and perceived ease of use. In their survey, perceived usefulness and perceived ease of use are the major determinants of users' behavior and intention. Notwithstanding, the applicability of this model, it has been proven widely across areas including investigating the intent to accept new technology in several various contexts, especially China and US firms, college students and their behavior on online shopping, internet banking, among others (Sin Tan, Choy Chong, Lin, & Cyril Eze, 2010).

TPB deals extensively on the perceived behavioral control by taking into consideration the perceived ease or difficulty in executing the behavior regarding the acceptance of the new technology. However, it is important to know that the combination of TAM and TPB models were drawn from TRA. The TPB model seen from several studies (Mathieson, 1991; Norman & Smith, 1995) was viewed as an important theory of human behavior based on social psychology in which attitudes and subjective norms are reflected as determinants of human behavior in relation to the acceptability of new technology. In spite of some setbacks of the model, it proposes that beliefs play an influential role in attitude which eventually leads to intention and behavior generation. Again, with respect to IDT, the model divides acceptors or adopters into certain classification; innovators, early adopters, early majority, late majority, and laggards (Liska, 1984; Sarver, 1983). By virtue of this, innovation as widely adopted

for self-utilization, as well as its accompanied satisfaction, has indicated the different magnitude of individual attitude and willingness to accept a new technology (Kesharwani & Singh Bisht, 2012). They further suggested that origination, communication channel, time, and social system are the main components that trigger a new idea or innovation. Figure 1 below further illustrates the extension of TAM by four dimensions which according to literature gives a vivid understanding of new technology adoption and acceptance.

Figure 1: Adoption and Acceptance model of internet banking from the Literature



Sources: (Sin Tan et al., 2010; Im, Hong, & Kang, 2011; Yu, 2012; Venkatesh & Zhang, 2010)

The UTAUT extends the TAM in that the model in the literature describes over seventy percent of the variance in intention. It suggested four more constructs as some determinants of behavioral intention and use behavior or attitude, these are; performance expectancy, effort expectancy, social influence, and facilitating conditions (Miltgen, Popovič, & Oliveira, 2013). In recent times, scholars have increasingly adapted the applicability of UTAUT to explain thoroughly in relation to technology and acceptance, for example, online shopping, e-banking, and m-banking (Sin Tan et al., 2010). However, as a matter of fact, internet penetration in a developing country like Ghana is very low as compared to the advanced economies. Low penetration affects most competitive industries, particularly in the financial sector. Indeed, the banking sector is viewed as one of the business environment that has been characterized largely by the internet (new technology) (Aliyu et al., 2014).

2.2 Related Works on the usefulness of online banking transaction

Online banking is considered largely as the virtual platform that allows both the banker and the customer to conduct financial transactions or payment remotely through the internet (Sin Tan, Choy Chong, Lin, & Cyril Eze, 2009). According to Hamid, Amin, Lada, and Ahmad, (2007), online banking refers to “the use of the internet as a remote delivery channel of banking system services via the World Wide Web (WWW) where it does not require proprietary software or access to a private network”. In view of this, the new phenomenon, by extension is automated service delivery of modern banking products and services tailored directly to customers via electronic and interactive communication service channels (Thambiah et al., 2010).

Owing to the numerous advantages of online banking transactions to customers, including faster and easy access to transact data, world-wide connectivity, remote account access, the new technology does not require proprietary software or access to the private network. As a matter of fact, the new technology is indeed a service delivery automated banks’ products and services tailored toward clients and prospective customers via electronics and interactive communication channels. Again the phenomena also offered basic services to banks’ staff and customers such as checking account balances, depositing and transfer of funds, access to transactions histories, cards (debit/credit) and cheques ordering, among others are all improvement brought by the new technology (Sin Tan et al., 2009).

In the context of developing countries in regions such as Africa, the situation of internet penetration is at a lower level. However, the rapid growth of internet connectivity across industries has necessitated the acceptance and adoption of this innovation since the new development ensures effectiveness, efficiency and above all the competitiveness and growth in the business environment. Adding to this, the advent of online banking transactions clearly facilitates and deepens business transactions that existed in the business-to-business (B2B) and business-to-customer (B2C) markets. Although several studies were done in this context, these studies sought to determine factors influencing customers to accept and adopt new technology. These factors in the literature include perceived usefulness, perceived ease of use, convenience, computer efficacy, security and privacy, device features, behavioral intention, and attitude, among others (Fishbein & Ajzen, 1975; Ahmad &

Hariri, 2012; Hamid et al., 2007; Liska, 1984). In simplifying their four main factors, on illustrating the conceptual model emanated from the literature. As a matter of fact, studies geared towards establishing consumers' constraints associated with the online banking transaction is barely found in the literature. Therefore, in this study, we seek to review that constraint that inhibits customers geared towards online banking transactions from an emerging economy perspective.

3 METHODOLOGY

Since the present study is entirely based on qualitative inquiry, the researchers employ document analysis (DA) as the research technique for executing the general aim of the research. Through document analysis, it could be seen as a simplified technique for this study, however, it is an excellent beginning point for retrieving an extant and relevant issue considering the wider coverage areas (Keller & Lehmann, 2006; Osakwe, 2016). In going forward, and to be more precise, the document analysis was premised on the bases of a high volume of the scientific manuscript that was traced from open databases such as SCOPUS, EBSCO, Thomson Reuter's WoS as well as Google scholar via the use of keywords search. For the purpose of deeper understanding, the researchers identified the relations and conformity of research constructs through theme analysis. This procedure gives the writers the due advantage of searching for relations and patterns across a variety of related articles given the interplay of the current study focus. In spite of this, the method gives an extant literature a broader scope of branding as the theme of focus, hence it is reasonable to use a document analysis as our methodology in this case since it provides a variety of study context in this situation (Bowen, 2009).

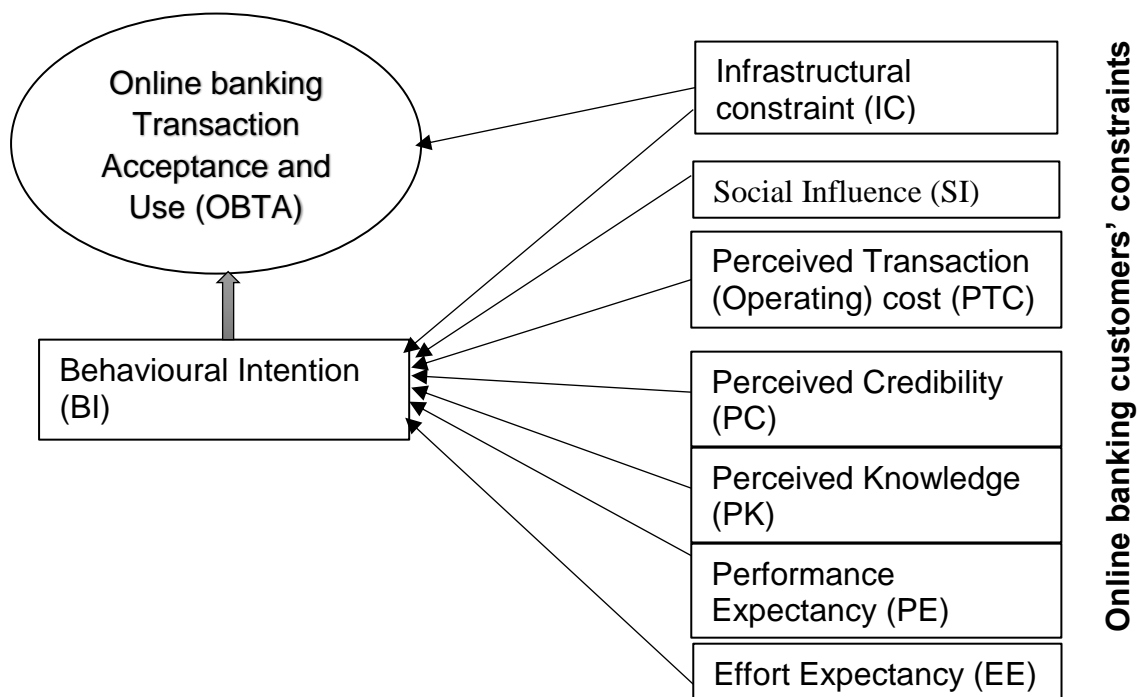
In the nutshell, through this approach, imperative content has been simplified related to the present theme in order to attain the proposed objective of our study. The ultimate goal of the present study is the development of a conceptual framework as indicated in Figure 1. We also adapted the nature of qualitative inquiry from scholarly works of (Bowen, 2009; Osakwe, 2016; Valk, Rashid, & Elder, 2010) and among others so as to establish the effective and efficient application of the proposed method. However, taken into consideration the multiplicity of extant literature, other researchers like (Braun & Clarke, 2006; Das, Agarwal, Malhotra, & Varshneya, 2019) Suggested that, a research procedure of this nature (like document analysis) helped to

identify critical themes for a given study, which thereby extend an existing knowledge to a present study. Therefore, we summarized our literature sources in table 1.

4 CONCEPTUAL FRAMEWORK AND PROPOSITION DEVELOPMENT

The research adopts an adapted version of the UTAUT model for the present study. This model has been extended widely from TAM by adding four dimensions in the previous study (performance expectancy, effort expectancy, facilitating conditions, and perceived credibility) (see from Sin Tan et al., 2009; Tan & Eze, 2008). From these four independent determinants based on UTAUT, the model ascertains the influence of an individual's behavioral intention which ultimately determines the attitude of the individual. By virtue of this, the four determinants were indicated as influential factors that trigger the customers' decision to accept and adopt new technology (thus online banking transaction) (Sin Tan et al., 2010). Hence, we adapted and modified the model for the current study which consists of five dimensions. The dimensions and their related attributes are derived from the literature (see table 1) in the area of information technology specifically in the scope of internet banking.

Figure 2: Proposed Conceptual Framework



Sources: Authors' modifications adapted from Venkatesh, Morris, Davis, & Davis, (2003)

4.1 Infrastructural constraint

From the viewpoint of technology adopters (customers), access to tangible and intangible infrastructures are necessary to achieve such innovation. Typical e-banking normally involves using physical gadgets like desktop computers and the use of mobile phones to initiate an online transaction. However, the lack of these facilities makes it impossible to engage in friendly with the new technology (Ahmad & Hariri, 2012; Miltgen et al., 2013; Tan & Eze, 2008). Also, owing to this is the internet connectivity between the banker and the client. The absence of an internet connection overwhelmingly discourages potential beneficiaries (bank's customers) not to engage in online banking transactions. To this note, the authors proposed that:

P1: Infrastructural constraints negatively influence the engagement of potential bank's clients in an online banking transaction.

4.2 Behavioral influence

Socio-cultural factors such as norms, values, and attitudes of a given society or group of persons play a significant role regarding the adoption and acceptance of new technology. Some cultural elements and beliefs are incompatible to meet the growing innovation in this technological era which makes innovation (new technology) diffusion more complex. As a matter of fact, the complexity of human behavior has been concluded as an important determinant influencing the adoption of new technology. This according to Dauda and Lee, (2015), and Bandura, (1989) had a significant impact on the acceptance of a new technology particularly in the quest to initiate an online banking transaction. Against this background, we propose that:

P2: Behavioral influence positively influences bank's customers in the initiating of online banking transaction

4.3 Transaction (operating) cost

Generally, banks' customers are usually dissatisfied when they are charged on transaction-related activities especially when the transaction cost does not consolidate to the service provided. Since the new technology comes with a cost, banks, therefore, shift (or share) the operating cost to the beneficiaries of this service to which customers of the banks are not isolated (Sathye, 1999; Yiu, Grant, & Edgar, 2007). Also,

many studies have suggested that a shift of such charges deter potential bank's clients to engage in an online banking transaction. In view of this, we propose that:

P3: Transaction (operating) costs charged by online bankers negatively influence bank's customers not to engage in an online banking transaction.

4.4 Perceived Credibility

In this present study, technological trust composed of two important dimensions, notably security and privacy (Stafford, Stafford, & Schkade, 2004). A consensus has been reached by many scholars that security and privacy are some of the most pressing concerns over the adoption and acceptance of the new technology (online banking transaction). However, many people are of the view that the internet is an open technology with easy accessibility and for that matter is not secured. This is because, security, according to Sin Tan et al., (2009) refers to the protection of information and/or system from unsafe situations or conditions. Therefore, security concerns are mostly on threats based on cyber-crimes such as money laundering, hacker related activities, virus attack, among others. Again, personalized information may be manipulated or tempered without the knowledge of the customer (Shankar & Meyer, 2009; Venkatesh & Zhang, 2010). In this study, technological trust refers to the safety of engaging in an online banking transaction without being interfered with by other parties that may cause the loss of private information. On the basis of the aforementioned arguments, the authors proposed that:

P4: Perceived credibility (security and privacy) has a positive influence on the adoption and acceptance of online banking transactions.

4.5 Perceived Knowledge and Effort Expectancy

Continuity and growth of any business organization rely largely on the awareness creation and value proposition. Information asymmetry (imperfect information) in the market place affects customers' choices in product selection and usage. In simple put, lack/inadequate knowledge of new products and services in the consumer market negatively affects the decision-making process of the consumer (Hanafizadeh, Keating, & Khedmatgozar, 2014). Therefore, banks obliged to provide full information regarding the perceived usefulness of a new product or service. In this

context, perceived knowledge is carved from TAM as one of the components generally known as perceived usefulness. A handful of studies have examined the perceived usefulness of a new technology acceptance and arrived at consistent findings that perceived usefulness(knowledge) have a significant relationship with new technology adoption or acceptance (Martins et al., 2014; Sathye, 1999; Sin Tan et al., 2009; Williams & Cothrel, 2000; Yiu et al., 2007). Against this background, we propose that:

P5: Perceived knowledge positively influence the adoption and acceptance of online banking transaction.

P6: Effort expectancy positively influences the adoption and acceptance of online banking transactions.

Table 1: A summary of online banking customers' leading constraints

Construct	Attributes	Literature sourced
1. Perceived Credibility	1. Security and privacy, 2. website social features,	(Stafford, Stafford, & Schkade, 2004), (Shankar & Meyer, 2009), (Venkatesh & Zhang, 2010), (Shankar, Smith, & Rangaswamy, 2003; Venkatesh, Morris, Davis, & Davis, 2003)
2. Facilitating conditions	1. Physical infrastructure, 2. Internet connectivity, 3. Accessible devices, 4. Quality of device	(Ahmad & Hariri, 2012; Miltgen, Popovič, & Oliveira, 2013; Tan & Eze, 2008), (Shankar et al., 2003; Venkatesh et al., 2003; Venkatesh & Zhang, 2010)
3. Behavioral intention	1. Personal feelings, 2. belief and intention 3. Attitude toward use	(Shankar et al., 2003; Venkatesh et al., 2003; Venkatesh & Zhang, 2010)(Dauda & Lee, 2015), (Bandura, 1989), (Venkatesh & Zhang, 2010),
4. Perceived Transaction cost	1. Perceived financial charges, 2.	(Sathye, 1999; Yiu, Grant, & Edgar, 2007) (Dauda & Lee, 2015; Yu, 2012)
5. Perceived Knowledge	1. Users' information, 2. Access to existing information, 3.online transaction support	(Sathye, 1999; Sohail & Shanmugham, 2003; Yiu et al., 2007)
6. Performance expectancy	1. Perceived usefulness, 2. Relative Advantage 3. Outcome expectations	(Davis, 1989), (Rogers, 1983), (Compeau & Higgins, 1995)
7. Effort expectancy	1. Convenience 2. Ease of use	(Moore & Benbassat, 1991), (Davis, 1989),

Source: from previous studies

5 CONCLUSION, IMPLICATION FOR THEORY AND PRACTICE, AND FUTURE RESEARCH DIRECTION

The study was aimed at reviewing the antecedence and barriers of internet banking adoption and acceptance from an emerging economy's perspective. Document Analysis (DA) as a research technique for executing the general aim of the study was employed. The study presents and highlights the antecedence of online banking transaction adoption specifically *infrastructural constraint, behavioral influence, social influence, operating(transaction) cost, perceived credibility, Performance Expectancy (PE) and perceived knowledge* were discovered as online banking customers' constraints. In theory, the study adds up to broaden the scope of internet marketing (banking) given the interplay of consumer behavior in the online banking transaction. The practical knowledge will help practitioners and industry players in the banking fraternity to strategize and repose confidence in customers in their quest to engage in online banking transactions.

However, the major limitation is that the current paper was based on a conceptual study without any empirical evidence. Again, the proposed conceptual framework described in the research theme cannot be exhaustive given the volume of literature in the marketing sphere, precisely online banking. We, therefore, call interested scholars who would be willing to test the prepositions of this model by empirical studies particularly in the context of growth-expiring online banks in the emerging economies.

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ACKNOWLEDGMENT

This work was supported by the Internal Grant Agency of FaME through TBU in Zlín No. IGA/FaME/2019/008; Project title: Country-of-origin effect on the domestic product (brand) purchasing intention and SME’s sustainability in developing countries. We deemed it great to also acknowledge EMAN 2019 for giving us space for some parts of the paper been presented at the 3rd International Scientific Conference – EMAN 2019 (<http://www.eman-conference.org>).

UNIVERSITY STUDENTS' BELIEFS ABOUT LEARNING AND KNOWLEDGE

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ABSTRACT

Results of the empirical research of students' beliefs about the nature of learning and knowledge are presented. The research is based on conceptions on the multidimensional nature of these beliefs and on findings indicating that these beliefs influence learning behavior. Students from the University of Belgrade (N=560) answered Epistemological Questionnaire. Structure, developmental level, and relations of these beliefs to students' age, year of studies and indicators of academic success (grades and the number of passed exams) were investigated. Factor analysis confirmed the existence of four dimensions of these beliefs: 1) avoiding integration, avoiding ambiguity, and dependence on authority; 2) belief that learning cannot be learned and that success in learning does not depend on the effort invested; 3) belief that ability to learn is inborn and that learning is quick and 4) believing in absolutely certain and unquestionable nature of knowledge. Low positive correlations were obtained between dimensions. Developmental level of these beliefs is not related to students' age, but during studies at the University beliefs become more sophisticated. At beginning years of studying students' express beliefs that concentrated effort is a waste of time, that learning ability is inborn and that learning is quick. Students who express sophisticated beliefs about learning had higher grades and passed more exams. Results indicate that development of students' beliefs about learning and knowledge should be longitudinally investigated. Development of these beliefs from naive to sophisticated can be influenced. Developing consciousness regarding one's own beliefs helps competences for living and working in contemporary society to develop. Encouraging a conceptual change – reorganization of knowledge structures – is the base for development of beliefs about learning and knowledge. Students should be included in different experiences during learning process.

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Improvement of learning process should be aimed to students' beliefs, not only to behavior.

KEYWORDS: beliefs about learning and knowledge, University students, factor analysis, academic success.

JEL CLASSIFICATION: I23

INTRODUCTION

Life in a knowledge-based society, characterized by rapid change, implies an openness to learning and development, adaptability and a readiness to assume an active role in the construction and application of knowledge. Appropriate beliefs concerning the nature of learning and knowledge are a prerequisite for active and responsible learning throughout one's life. Non-expert beliefs concerning the nature of learning and knowledge reflect personal, non-scientific theories of knowledge (Hofer, 2005; Mirkov, 2013; Schommer, 1990; Schraw, 2013). After the first investigations of epistemological beliefs as a broad one-dimensional construct (Brooks, 1998; Perry, 1985; 1999), from the 1990s onwards the multi-dimensional nature of epistemological beliefs has become the focus of research (Schommer, 1998; Schommer, Crouse, & Rhodes, 1992; Schommer, Calvert, Gariglietti, & Bajaj, 1997; Schommer-Aikins, 2004; Schommer-Aikins, Duell & Hutter, 2005; Schommer-Aikins & Easter, 2006). Different approaches in research have been developed and the application of methodologies is dependent on initial theoretical assumptions (Pavlović 2008, 2009; Plazinić, 2013). In the research that assumes the existence of a unified epistemological position a qualitative methodology is applied, while in the investigation of multidimensional beliefs about the nature of knowledge and learning the psychometric approach is utilized. It has been confirmed that maturing and education influence the formation of beliefs on learning and knowledge (Schommer et al., 1997; Pavlović, 2009), and that these beliefs influence personal attitudes and learning behaviors, specifically: information interpretation, written text understanding, understanding monitoring, making an effort to carry out tasks; and attitude towards school (Braten & Stromso, 2006; Hofer, 2001, 2005; Law, Chan, & Sachs, 2008; Mirkov, 2013; Muis, 2004; Phan, 2008, 2009; Schommer-Aikins & Easter, 2006; Stoeger, 2006).

In this paper we present the findings from an investigation of the beliefs of university students about learning and knowledge. We proceed from the conception of the multi-dimensional nature of these beliefs, specifically three basic dimensions: the nature, the certainty and the origin of knowledge. These dimensions have been conceptualized as continuous, ranging from two opposing poles – from “naïve” to “sophisticated” beliefs. Presented from the naive perspective, these beliefs represent a system of relatively independent dimensions: belief in the absolute certainty of knowledge; that knowledge is organized into isolated segments; that knowledge is imparted by an authority (rather than developed by the learner); belief in a fixed and unchangeable ability to learn, and that learning is quick or not happen at all. Formulated in this manner, the beliefs reflect the initial stadium of the development of a personal epistemology. The Epistemological Questionnaire – EQ (Schommer, 1990, 1998) examines these beliefs based on four epistemological criteria: the changeability of the ability to learn, the structure of knowledge, the speed of learning and the stability of knowledge. Our aim was to establish in what way certain student beliefs on knowledge and learning are organized, what their relations are, whether they change during studies and how they relate to academic achievement. The following research questions were posed: What is the structure of the beliefs of students concerning knowledge and learning? What are the relationships between certain beliefs? Is there a difference in the distribution of these beliefs relative to the age of the students or their year of study? Are they connected to indicators of academic success?

METHOD

Our research involved students (N=560; 81.4% females¹) in the first to fifth year of study at the Faculty of Philosophy (46.40%), Faculty of Philology (31.40%) and Teacher Training Faculty (22.10%) at the University of Belgrade, with an average age of 21.84 years (SD=2.20, ranging from 19 to 42 years). First-year students account for 34.8% of the sample, second-year students for 25%, third-year students for 18.1%, fourth-year students for 21.3% and fifth-year students for 0.9%. Data on the average

¹ Female students accounted for 76% of the total number of students in the first year of studies, 85% of the total number in the second year, 79% in the third year, 85.7% in the fourth and 100% in the fifth year of studies.

grade achieved in exams (range from 5.40 – 10.00; M=8.45; SD=0.75) and the number of exams passed (range 0 – 50; M=21.05; SD=0.75) were obtained from the students via the questionnaire. The questionnaire employed was the Epistemological Questionnaire – EQ, which presents a five-point Likert-type scale (Schommer, 1990; Simić, Savanović, & Jokić, 2012; Plazinić, 2014) and contains 63 items² divided into 12 subscales (Table 2). During their regular classes, students answered the questionnaire by noting their level of agreement with the statement given. In order to establish the structure of their beliefs about knowledge and learning, the method of principal component factor analysis in 63 items was utilized. The methods of descriptive statistics were applied to determine the level of development of certain dimensions. Also performed were correlational analyses (Pierson coefficient) so as to establish the relation between the factors and how the beliefs related to the age of the student, the year of study and their academic success.

RESULTS AND DISCUSION

Using factor analysis, we explored the latent structure of the students' beliefs about learning and knowledge. From the space of the beliefs³ four latent second-order dimensions were extrapolated (Table 1), which explained 53% variance. The majority of earlier research conducted on college students (Schraw, 2013) obtained factor solutions which could explain the lower percentage of variance (20% - 35%).

Table 1. Principal Component Analysis on 12 EQ subscales scores

<i>Components</i>	<i>Initial solution</i>	
	<i>Eigen values</i>	<i>% of variance explained</i>
1. Avoidance of integration, avoidance of ambiguity and dependence on authority	2.44	20.34
2. The belief that one cannot learn how to learn and that success in learning is unrelated to hard work	1.82	15.19
3. The belief that learning ability is innate and that learning is quick	1.09	9.14
4. The belief in absolutely certain and unquestionable nature of knowledge	1.05	8.82

Source: Own research

² Examples of the statements given in each subscale are presented in Appendix 1

³ Previously, average scores for each of the 12 subscales EQ were obtained.

In earlier research, the analysis of 12 subscales frequently obtained a four-factor structure, which includes factors such as: Simple Knowledge, Certain Knowledge, Quick Learning and Fixed Ability (Schommer, 1990; Schommer, Crouse, & Rhodes, 1992). The structure we obtained in our research (Table 2), also a four-factor structure, is similar to those obtained in earlier research, however, it contains certain peculiarities which distinguish it from other research conducted on University and high-school students in Serbia (Simić, Savanović, & Jokić, 2012; Plazinić, 2014) and other countries (Schommer, 1990; Schraw, 2013; Schommer-Aikins, Duell, & Hutter, 2005). For example, from a sample of students of Psychology and Mathematics (Plazinić, 2013) two factors were obtained – Naive beliefs on the nature of learning and Naive beliefs on the nature of knowledge – which explain the 51.2% variances.

Table 2 Structure of beliefs about learning and knowledge (Rotated component matrix)

<i>Subscales</i>	<i>Factors</i>			
	<i>1</i>	<i>2</i>	<i>3</i>	<i>4</i>
Avoid integration	.705			
Avoid ambiguity	.691			
Depend on authority	.651			
Seek single answers	.570			
Can't learn how to learn		.766		
Success is unrelated to hard work		.701		
Learn the first time		.520	.294	
Concentrated effort is a waste of time			.756	
Ability to learn is innate			.612	
Learning is quick		.356	.556	.308
Knowledge is certain				.838
Don't criticise authority				.562

Source: Own research

The indicators given in Table 3 suggest that there are low statistically significant positive correlations between dimensions, except in two cases: the first and second dimension, and also the second and fourth dimensions are not correlated.

Table 3 Correlations between factors

	FA2	FA3	FA4
FA1: Avoidance of integration, avoidance of ambiguity and dependence on authority	-.03	,20**	,29**
FA2: The belief that one cannot learn how to learn and that success in learning is unrelated to hard work		,28**	-.02
FA3: The belief that learning ability is innate and that learning is quick			,19**
FA4: The belief in absolutely certain and unquestionable nature of knowledge			

Source: Own research

On the basis of the results obtained from the second-order factor analysis, average scores were obtained for each factor, which point to the level of development of the four types of beliefs about learning and knowledge.⁴ It was confirmed that all four dimensions were moderately present amongst the students (Table 4), meaning that students' beliefs about learning and knowledge can be described as moderately sophisticated.

Table 4 Descriptive statistics

	<i>N</i>	<i>Min</i>	<i>Max</i>	<i>M</i>	<i>SD</i>
FA1	559	1.86	4.04	2.87	.33
FA2	559	1.25	3.92	2.21	.41
FA3	559	1.55	3.91	2.53	.41
FA4	559	1.00	8.67	2.38	.52

Source: Own research

In order to examine the relationships between the four factors of students' beliefs about learning and knowledge and the students' age, year of study and indicators of academic success, we performed correlation analyses (Pearson coefficient). The data obtained is presented in Table 5.

⁴A higher score indicates more sophisticated beliefs.

Table 5 Correlations between dimensions of beliefs about learning and knowledge and age, year of studies, and indicators of academic success

<i>Beliefs about learning and knowledge</i>	<i>Age</i>	<i>Year of studies</i>	<i>Grade average</i>	<i>Number of passed exams</i>
Avoidance of integration, avoidance of ambiguity and dependence on authority	,05	-,04	-,21**	,03
The belief that one cannot learn how to learn and that success in learning is unrelated to hard work	,03	-,10*	,14**	-,08
The belief that learning ability is innate and that learning is quick	,10*	-,21**	,06	-,17**
The belief in absolutely certain and unquestionable nature of knowledge	,09*	-,13**	-,09*	-,11**

Source: Own research

Statistically significant correlations between the four dimensions of beliefs on learning and knowledge and the age of the students were not present (Table 5). Low negative correlations between the year of studies and certain dimensions of beliefs were found: belief in the innate ability to learn and that learning is quick; belief in the absolutely certain and unquestionable nature of knowledge and the belief that learning cannot be learned and that success in learning does not depend on effort invested (Table 5). Students at the beginning of their studies show greater belief that concentrated effort is a waste of time, and also that learning ability is innate and that learning is quick, as opposed to students who are in the final years of their studies. This indicates that students in their final years of study tend to have more sophisticated beliefs compared to students at the beginning of their studies. Reliable conclusions could be drawn from a longitudinal study. The findings of other research (Cvijan, 2008) indicate that there might be qualitative, and not only quantitative differences in epistemological beliefs relating to the students' age and year of studies. In any case, with the application of qualitative methods, more complete data might be obtained.

The results obtained (Table 5) indicate that there is a negative correlation between the dimension Avoidance of integration, avoidance of ambiguity and dependence on authority and the average grade in exams, as well as a low positive correlation between the dimension Belief that learning cannot be learned and that success in learning does not depend on effort and the grade average. The dimensions

Belief that the ability to learn is innate and the learning is quick and the Belief in the absolute certain and unquestionable nature of knowledge are negatively correlated with the number of exams passed. Although certain beliefs about learning and knowledge are connected to different indicators of academic success, in principle, students who express more sophisticated beliefs have higher grades and pass more exams, compared to students who express naive beliefs about learning and knowledge. The avoidance of integration, avoidance of ambiguity, dependence on authority and the search for one answer can be related to the quality of knowledge. Weak tendencies relating to the connection between the beliefs that learning cannot be learned, that success does not depend on effort invested, that learning happens at first, and the students' grade average did not give the expected result. Although weak intensity correlations were obtained, it might be assumed that their experiences during studies at university, but also in elementary and high school, influence the formation of beliefs that success depends on luck and not on effort. Although further research is necessary, these results indicate that the development of sophisticated beliefs could be encouraged through changes made to the teaching and evaluation systems. Results of other research do not suggest that there are connections between the sophistication of epistemological beliefs of high-school students and their school success (Simić, Savanović, & Jokić, 2012), however, significant correlations were found between the epistemological beliefs of students of Psychology and Mathematics and academic success (Plazinić, 2014): naive beliefs about the nature of knowledge were related to lower achievement, while beliefs on the nature of learning do not significantly contribute to academic success. Our findings, however, indicate that beliefs that the ability to learn is innate, that learning is quick, and that knowledge is certain might be connected to a lower number of exams passed (Table 5). On the basis of the results shown, the connection between the beliefs of students with certain indicators of academic success should stimulate further research into the possibility of encouraging the transformation of naive beliefs into sophisticated beliefs, in accordance with the implications of earlier studies (Kienhues, Bromme & Stahl, 2008), while the results which indicate variations in the levels of sophistication of certain beliefs about learning and knowledge at different years of studies point to the need for longitudinal research.

CONCLUSIONS AND IMPLICATONS

According to our findings, the dimensions of the beliefs about learning and knowledge amongst the students are moderately sophisticated. Certain dimensions of beliefs about learning and knowledge are weakly connected. The results match the theoretical conceptions of the multi-dimensional nature of epistemological beliefs. It was confirmed that the level of development of the students' beliefs about learning and knowledge do not differ relative to their age but there are indications that changes to beliefs occur during studies. This opens up the possibility of influencing the development of these beliefs. According to the findings of earlier studies (Hofer, 2001) sophisticated epistemological beliefs positively influence the use of learning strategies and also the learning outcomes. Interventions in teaching process should be directed towards the encouragement of the understanding of fundamental epistemological assumptions which are at the basis of critical thinking: that there is not only one right answer; that the development of science and the understanding of truth is subject to change; and that attitudes which might seem in opposition to one another can be synthesized within a new framework. The basis of the development and transformation of beliefs about learning and knowledge is encouraging conceptual changes, that is, the reorganizing existing knowledge structures with focus on the overcoming of naive or erroneous assumptions about certain scientific concepts. The starting point for conceptual change is a dissatisfaction with existing concepts based on a discrepancy between existing beliefs and new experiences.

Certain dimensions of the students' beliefs about knowledge and learning are moderately connected to different indicators of academic success. The found correlations are low and match the findings obtained in other studies (Schommer-Aikins, 2004). However, although the direct influence of the students' beliefs about learning and knowledge might be weak, the indirect influence could prove to be much more significant. The relationship between the students' beliefs and their academic achievement could be mediated by other variables, such as their learning intentions and behaviors, as indicated by earlier research (Braten & Stromso, 2006; Neber, & Schommer-Aikins, 2002; Simić, Savanović, & Jokić, 2012). For this reason, it is necessary to investigate the relationship between the students' beliefs about learning and knowledge and goal orientations they adopt and their use of different learning strategies. Previous research (Braten & Stromso, 2006) confirmed that

epistemological beliefs influence the adoption of goals. Students who believe that knowledge is certain and that it is acquired passively do not adopt mastering goals and are not ready to make a greater effort to complete their tasks. The belief that learning is quick can negatively influence the development of adaptive forms of regulation and for this reason it is recommended that teaching at the university level address the issue of overcoming the belief that learning is quick or not happen at all.

In further research it is necessary to apply different methodological approaches and to include a wider complex of variables, especially taking into account their mutual relationships. Longitudinal studies would contribute to a deeper understanding of the ways in which teaching approaches and other environmental variables influence students' beliefs about learning and knowledge. It is more and more apparent that there is a need for systemic models into which epistemological beliefs would be incorporated, thus creating a complex system which would include groups of different variables (Schommer-Aikins, 2004), from variables relative to cultural beliefs (collectivism – individualism) to concrete teaching methods (debates, cooperative groups, asking questions) and variables connected to self-regulated learning (learning strategies, understanding, metacognition, critical thinking and problem solution).

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APPENDIX 1 – EQ SUBSCALES AND STATEMENTS EXAMPLES

<i>Subscales</i>	<i>Statements examples</i>
Seek single answers	Most words have one clear meaning. (+) A tidy mind is an empty mind. (-)
Avoid integration	You will just get confused if you try to integrate new ideas in a textbook with knowledge you already have about a topic. (+) I try my best to combine information across chapters or even across classes. (-)
Avoid ambiguity	It's a waste of time to work on problems which have no possibility of coming out with a clear-cut and unambiguous answer. (+) I find it refreshing to think about issues that authorities can't agree on. (-)
Depend on authority	Sometimes you just have to accept answers from a teacher even though you don't understand them. (+) When you first encounter a difficult concept in a textbook, it's best to work it out on your own. (-)
Knowledge is certain	If scientists try hard enough, they can find the truth to almost anything. (+) Nothing is certain, but death and taxes. (-)
Don't criticise authority	People who challenge authority are over-confident. (+) Often, even advice from experts should be questioned. (-)
Ability to learn is innate	The ability to learn is innate. (+) Some people are born good learners, others are just stuck with limited ability. (+)
Learning is quick	Successful students understand things quickly. (+)

	If a person can't understand something within a short amount of time, they should keep on trying. (-)
Concentrated effort is a waste of time	If a person tries too hard to understand a problem, he will most likely just end up being confused. (+) Usually you can figure out difficult concepts if you eliminate all outside distractions and really concentrate. (-)
Can't learn how to learn	Self-help books are not much help. (+) Everyone needs to learn how to learn. (-)
Success is unrelated to hard work	The really smart students don't have to work hard to do well in school. (+) Genius is 10% ability and 90% hard work. (-)
Learn the first time	Almost all the information you can learn from a textbook you will get during the first reading. (+) If I find the time to re-read a textbook chapter, I get a lot more out of it the second time. (-)

ACKNOWLEDGMENT: The paper presents the results of the work on the projects "Improving the quality and accessibility of education in modernization processes in Serbia" (No. 47008) and "From encouraging initiative, cooperation and creativity in education to new roles and identities in society" (No. 179034). The research was financed by the Ministry of Education, Science and Technological Development of the Republic of Serbia. The results of this paper have been presented at the 3rd International Scientific Conference – EMAN 2019 (<http://www.eman-conference.org>).

ACHIEVING DYNAMIC STABILITY OF ORGANIZATION IN KNOWLEDGE ECONOMY

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ABSTRACT

The growth and development of modern organizations are based on knowledge, knowledge production and constant investment in human capital. Changeability of the competitive environment and prevalence of the economy of knowledge over the traditional economy requires searching for a new type of stability. Survival in the market arena and the success in adjusting to changes in the global competitive environment are reflected in the ability of the organization to achieve dynamic stability. The main purpose of this article is to explore the role of learning in the accumulation of human capital in order to achieve the dynamic stability of the organization in the conditions of knowledge economics. The working hypothesis is: The long-term sustainable dynamical stability of the organization can be achieved through the constant accumulation of human capital. Scientific research methods applied in order to confirm the working hypothesis are the methods of analysis and synthesis, method of mathematical modeling and method of mathematical programming.

KEYWORDS: Knowledge economy, dynamic stability, organisation, human capital

JEL CLASSIFICATION: J21, J32, J53, L23

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1. INTRODUCTION

Economies get labeled according to the work people predominately do in them. The industrial economy replaced the agrarian economy when people left farms for factories; then the knowledge economy pulled them from factories to office buildings. When that happened, the way workers added value changed, too. Instead of leveraging their brawn, companies capitalized on their brains. No longer hired hands, they were hired heads (Seidman, 2014). In the new economy, the knowledge of its workforce is the greatest value a company has. These changes are reflected in the increasing relative share of the gross domestic product that is attributable to "intangible" capital (Abramovitz & David 1996). Powell & Snellman (2004) define the knowledge economy as production and services based on knowledge-intensive activities that contribute to an accelerated pace of technical and scientific advance, as well as rapid obsolescence. In the knowledge economy, the knowledge that it is able to harness is the organization's competitive advantage. Unfortunately, very few are able to harness this asset in a meaningful way. Even fewer are organizations that are able to optimize the use of their important asset (Uriarte, 2008).

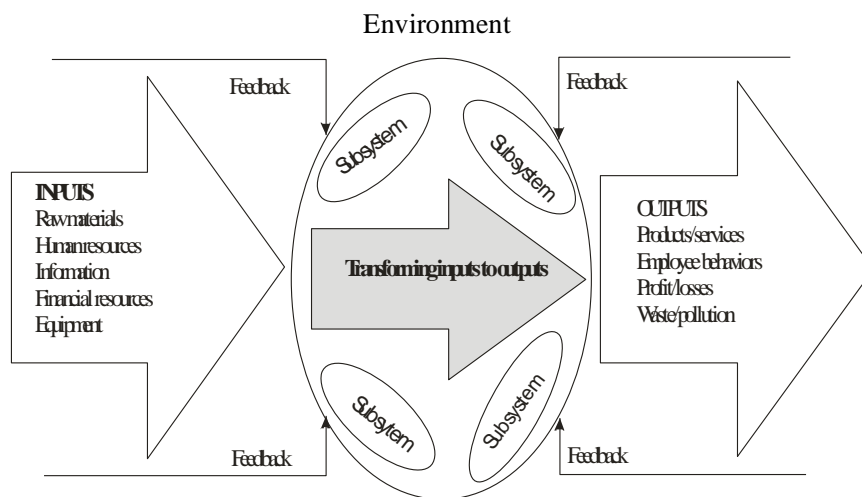
Workers in the Knowledge Economy (Lynch, 2003) will have characteristics including: an ability to adapt to constant change and uncertainty; capacity to work in knowledge and service based economies; and participate as constructive members in cohesive social communities. Intelligent management that seeks to enhance competitive power of organization is closely related to the construction of continuous multidirectional communication between the management, employees, members, users and all other stakeholders within the organization's environment. All of this has enabled the creation of small, flexible companies, structured on knowledge economy, capable of operating globally with success. Generally speaking, all sorts of businesses are forced to operate in a society that is, for the time being at least, bent towards progressive change, and the only source of competitive advantage is a valid and timely adaptation. Adapting or achieving dynamic stability is only possible when the required efforts to create a learning organization are recognised and made, and when this does not distract from the actuality of current business. In accordance with the subject of research, scientific methods of induction, deduction, and comparative analysis were

applied. Practical example of optimizing remote human resources training is presented using a mathematical and computer-supported model (MS Excel spreadsheet).

2. KNOWLEDGE MANAGEMENT AS A FACTOR FOR DYNAMIC STABILITY OF COMPANY

Companies are open systems (cf. figure 1) which operate according to a number of contemporary trends, such as: 1) globalization, 2) changes in workforce, 3) new employment relations, 4) information technology, 5) values and ethics.

Figure 1. Open-systems perspective of organization

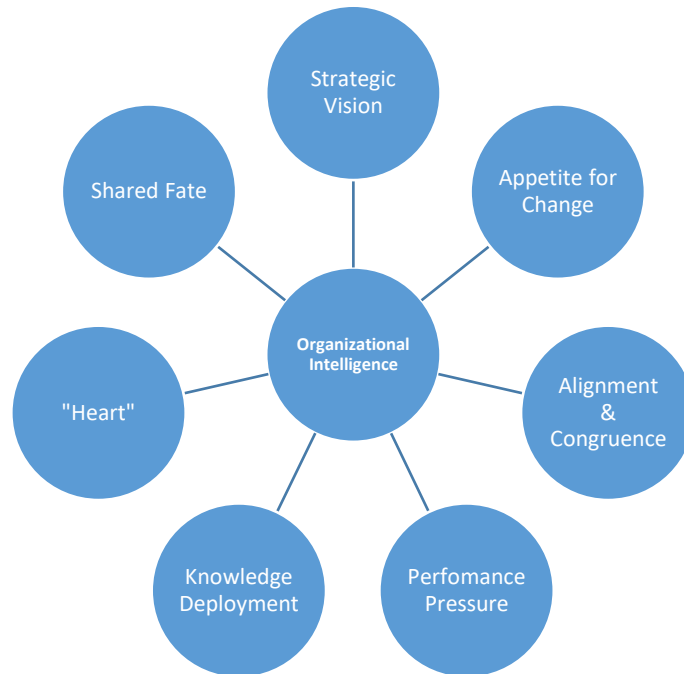


Source: Authors prepared according [McShane & Von Glinov \(2010\), Organizational Behavior, 5th edition, McGraw-Hill/Irwin, New York, p.8.](#)

In order to rise to these challenges, companies need to establish a structure that will enhance the development of human capital and enable efficient knowledge management. Two basic concepts of corporate structure design are: 1) mechanical and 2) organic. Organic structure (team-oriented structure, matrix structure, network structure) is inherent to an environment prone to rapid changes. The organic structure is flexible and adaptable. Coordination is achieved through constant communication and adaptation. There is decentralization of decision-making, and while the employees do have specific tasks, new tasks are continuously introduced, thus continuous knowledge development and teamwork that promotes creativity are established. The capacity to create, transform, organize, share, and apply knowledge is becoming an

ver more critical aspect of competing in complex business environments. According to Albrecht (2003) knowledge deployment is one of the seven key dimension of organizational intelligence (cf. figure 2).

Figure 2. Seven traits of organization intelligence



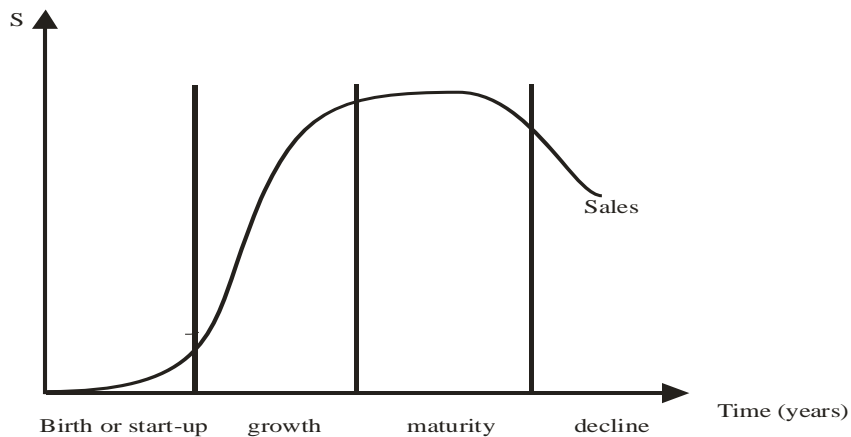
Source: Authors prepared according Albecht, K. (2003). The Power of Minds at Work, AMACOM, NeyYork, p.44

According to the research carried out by Rafajac and Pupavac (2017) in most dimensions of organizational intelligence, small and medium-sized organizations achieve higher results than large organizations in the Republic of Croatia. This research was including 151 enterprises. Organizational intelligence refers to the ability of organizations to engage their members with common purpose, through exchange and sharing of resources, ideas and information at all levels, with the intention of smart integration of available resources and in order to create products and services that increase their competitiveness with respect to the environment in which they operate. The results of empirical research show that there is a statistically significant positive correlation between competitiveness and organizational intelligence ($r = 0.63$, $p < 0,01$). In most dimensions of organizational intelligence small and medium-sized organizations achieve better results than large organizations, while organizations in private ownership show significantly higher levels of organizational intelligence than organizations in public ownership.

As far as organizational commitment is concerned, there are significant differences among the three groups, with organizational commitment being the highest in small organizations, and the smallest in large organizations. Regarding the willingness to change, small and medium-sized organizations, show a significantly higher inclination than large organizations, while there are no significant differences between small and medium-sized ones. In the knowledge deployment dimension, small and medium-sized organizations also achieve significantly better results than large organizations, while there is no significant difference between small and medium-sized organizations, similar to the situation in the performance dimension. Process of knowledge management consists of the following three activities: 1) acquiring knowledge - employing people with the necessary knowledge, or taking over entire companies, or learning and experimenting; 2) sharing knowledge - a community of informal group of people linked by professional interest and passion of sharing knowledge and cooperation; 3) use of knowledge - the already existing knowledge should be used to increase the efficiency and effectiveness of an organization. Using knowledge and transferring it to new employees is most successful if it is stored. Organizational memory is a dynamic storehouse for storing and keeping intellectual capital. It should contain all information and knowledge of its employees, as well as the knowledge embedded in systems and structures of the organization. Also: documents, objects, and every little thing that pertains meaningful information on the workings of organization. Organizational memory needs to be continually expanded and modernized by transferring human capital to structural capital and by abandoning knowledge that no longer contributes to competitiveness of organization. The advantage of structural capital is its ability to work 24 hours a day (Edvinsson, 2003, 141).

Knowledge should be flexible in each stage of the company's business cycle in order to adapt to demands of modern production and the modern market. Company's business cycle model typically reflect a sequential progression through stages such as birth or start-up, growth, maturity and even decline (cf. figure 3).

Figure 3. Company's life-cycle



Source: Authors prepared according Rutherford, M., Buller, P., McMullen, P. (2003). Human Resource Management Problems Over the Life Cycle of Small and Medium-Sized Firms, Human Resource Management, Vol. 42. No. 4, p.322

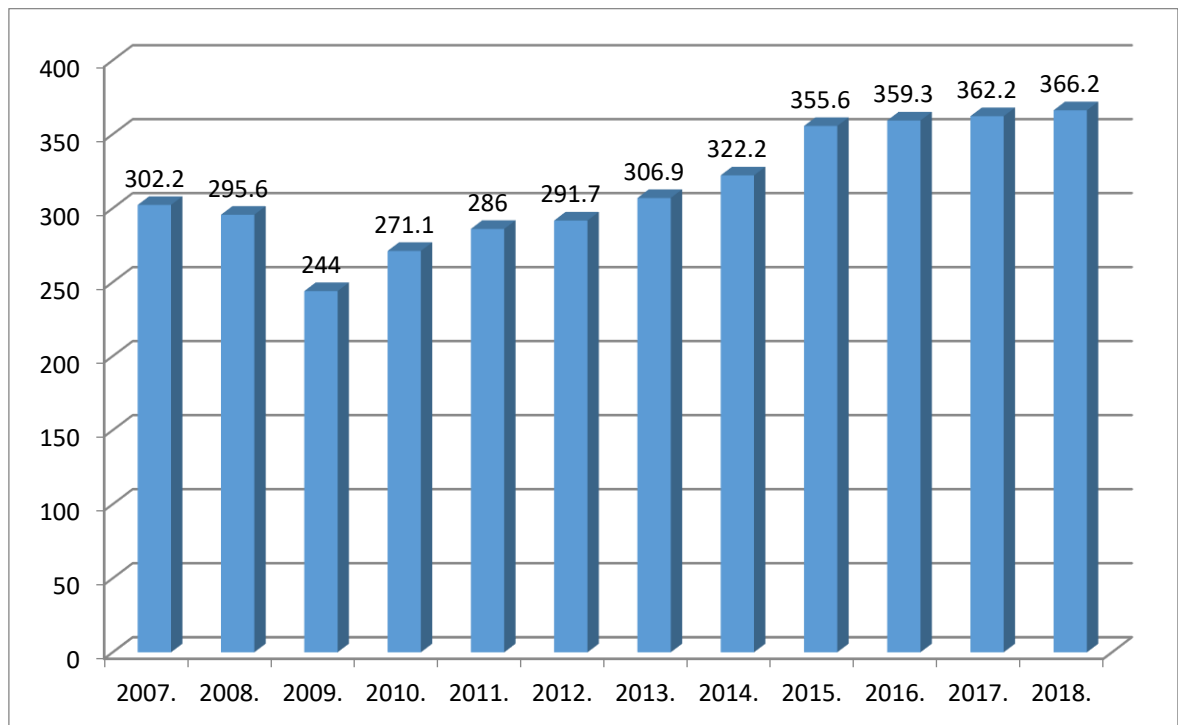
The model of company's life-cycle enables the concept of strategic human resource analysis to develop, and that is related to company's development phases up to the stage of maturity; it is also important in sustaining the company in the stage of maturity for as long as possible, and in preventing its degradation. Human resources predictions using the life-cycle model are focused more on the profile and less on the number of needed workers/managers, and at each stage of its development, the company needs full integration of human resources. Dess & Lumpkin (2003., 118) argue that to be successful, organization must continually enhance their human capital through three HRM activities: hiring/selection (including recruitment and selection), development (including training, employee involvement, and performance appraisal), and retention (including compensation and stimulating work environment). Training problems are highest in the high growth stage.

Predicting the number of employees by using the life-cycle model helps to determine the future qualification structure of employees (Pupavac, Zelenika, 2004), the future structure of employees by basic categories (senior, middle, lower managers, experts and specialists, engineers, production workers), the future age of employees, the future sexual structure of employees, all in the function of achieving dynamic stability.

3. LEARNING AND ACHIEVING OF DYNAMIC STABILITY

If businesses are to achieve their business goals, an organized learning activity should be initiated within. Learning companies are able to adapt to changes in their environment, but also to initiate changes that have a competitive advantage. Accordingly, learning should be seen as a long-lasting, continuous process that positively affects the income growth and productivity of employees. Investing in learning increases the value of companies and employees. This is why companies increasingly train their employees by helping them develop their full potential, that is, the funds allocated for education of employees have been growing rapidly (cf. figure 4).

Figure 4. Market size of the global workplace training industry from 2007 to 2017 (in billion U.S. dollars)



Source: Mazareany, E. (2019). Spending in the global workplace training industry 2007-2018. (available at: <https://www.statista.com/statistics/738399/size-of-the-global-workplace-training-market>)

In 2017, corporations estimated spending around 362.2 billion U.S. dollars on corporate training initiatives worldwide or 48,44% more than in 2009. According to the Training Industry Report (2016), an average training cost per employee 2016 comes to \$1,041.

Learning is a relatively permanent change in behaviour (or a behavioural tendency) that results from the interaction of an individual with the environment. By adjusting their behavior in the work process, employees become responsible and productive. Working helps them achieve certain goals (pay, independence). In order to achieve those goals, they repeat their behaviour. If the behaviour has caused a negative effect, the repetition is absent.

There are two types of knowledge that employees need to be successful at workplace: 1) explicit knowledge and 2) tacit knowledge. Explicit knowledge comprises anything that can be codified, documented and archived. These include knowledge assets such as reports, memos, business plans, drawings, patents, trademarks, customer lists, methodologies, and the like. In many organizations these knowledge assets are stored with the help of computers and information technology, so that can easily be transmitted from one person to another. Tacit knowledge is personal. It is stored in the heads of people. It is accumulated through study and experience. It is difficult to formalize, record or articulate. Tacit knowledge can be shared and communicated through various activities (workshops, conversation, job training) and mechanisms (email, groupware, instant messaging). For example, airline pilots learn to operate commercial jets more by watching experts and practicing on flights simulators than by attending lectures (McShane & Von Glinov, 2010). The sharing of tacit knowledge is a great challenge to many organizations.

Personal knowledge can become organizational knowledge through the dynamic interaction between tacit knowledge and explicit knowledge. This dynamic process is the essence of knowledge creation in an organization. This interaction between the two types of knowledge bring about what is called the four modes of knowledge conversion (Nonaka, 1996).

Table 1. Interaction between tacit and explicit knowledge

	To tacit knowledge	To explicit knowledge
From tacit knowledge	Socialization	Externalization
From explicit knowledge	Internalization	Combination

Source: Uriarte, F. (2008). Introduction to Knowledge Management, ASEAN Foundation, Jakarta, Indonesia, p. 7.

Socialization is a process of creating common tacit knowledge through shared experiences. To start socialization, we need to build a “field” of interaction, where individuals share experiences at the same time and space, thereby creating common unarticulated beliefs or embodied skills. Young apprentices work with old master craftsmen, thereby acquiring technical skills through observation, imitation, and practice. **Externalization** is a process of articulating tacit knowledge into such explicit knowledge as concepts and/or diagrams, often using metaphors, analogies, and/or sketches. This mode is triggered by a dialogue intended to create concepts from tacit knowledge. Creating a new product concept is a good example of externalization. **Combination** is a process of assembling new and existing explicit knowledge into a systemic knowledge such as a set of specifications for a prototype of new product. **Internalization** is a process of embodying explicit knowledge into tacit, operational knowledge such as know-how. This mode is triggered by “learning by doing or using.”

4. OPTIMIZATION OF REMOTE HUMAN RESOURCES TRAINING INTRODUCTION

If you were an employee on Henry Ford’s assembly line in Detroit in the 1920s, you received a high degree of training and preparation before you ever set foot in the factory. You learned what your role was, and were given all the tools you needed to accomplish your job from Day One. From then on, your role never changed—you did your part to move a product forward along the assembly line, from the day you began until the day you retired, 40 or 50 years later. Since those days, the business world has transformed — everything that can be automated has been automated. Today, we are in the knowledge economy, and there is new knowledge we are required to learn and apply daily (Mehta, 2016). Flexibility and adaptability, as core determinants of modern businesses, are grounded in human resources, the only dynamic element of a company.

The dynamics of human resources is achieved through continuous education, so that human resources become the core capital, source of strength and success of modern businesses. Well-trained employees are essential to the success of any company. The right training program will have increase employee engagement, retention, and productivity; it decreases the need for supervision, reduces absenteeism, improves customer service, and boost sales. Numerous

companies are becoming aware of continuous education and training of human resources as one of the most effective ways of creating and maintaining competitive advantages. In the new economy, intelligent companies win, learning companies, companies that truly believe in people and their knowledge as the most valuable asset. Intelligent companies are those that systematically collect information from the environment, turn them into knowledge, incorporate that knowledge into their organizational structure, and finally react adequately to threats and opportunities that are arising from the environment. Learning companies are able to adapt to changes in the environment, but also to simultaneously initiate changes that can serve as their competitive advantage. Thus, knowledge is at the centre of the core of business competence and the problem of full responsiveness to environmental challenges can be approached from the point of acquiring new knowledge and its use.

Proper training has a positive effect on employee and customer retention, sales and overall profitability. Training budget will vary based on organization specific business training needs, but typically 2 – 2.5% of the company's budget allocated to employee training is considered standard [Andriotis, 2017]. Training budget is a way to ensure that employees has the skills and competencies required to complete tasks up to the required standard of quality. The question becomes how to optimize training costs and how to maximize the return on training costs. Accordingly, in the follow-up, a mathematical and computer-supported model of the optimal organization of remote human resources training is presented.

Due to introduction of new robotized equipment, a manufacturing company is to send 10 Z_1 candidates to additional training abroad, 24 Z_2 candidates and 16 Z_3 candidates. As robotized equipment is acquired abroad, the supplier, cooperating with two large manufacturing companies where new equipment has been successfully implemented more than a year ago, offered an additional training program. As the obligation for an additional training program was not included in the purchase agreement, the supplier, in cooperation with the manufacturing companies submitted the following offer (see Table 2).

**Table 2. Costs for additional training of workers in three required occupations
 (in €)**

Occupation	Z ₁	Z ₂	Z ₃
Manufacturing company			
Manufacturing company I	500	800	1 000
Manufacturing company II	400	750	1 200

Both manufacturing companies can undertake additional training for the three required occupations, but due to the volume of work within the required period, the Manufacturing Company I can receive a maximum of 30 candidates and the Manufacturing Company II 20 candidates. Thus the manager of human resources is faced with the problem of organizing additional training of employees abroad, with minimal training costs.

Mathematical model:

$$f = 500x_1 + 800x_2 + 1000(30 - x_1 - x_2) + 400(10 - x_1) + 750(24 - x_2) + 1200(x_1 + x_2 - 14)$$

$$= 300x_1 + 250x_2 + 35200$$

To determine

$$(\min) f = 300x_1 + 250x_2 + 35200$$

With constrains

$$x_1 + x_2 \leq 30$$

$$x_1 \leq 10$$

$$x_2 \leq 24$$

$$x_1 + x_2 \geq 14$$

with the condition

$$x_1, x_2 \geq 0$$

Intelligent managers use computers to optimize the costs of human resource training. Accordingly, a computer-supported model with a view to addressing the problem is presented below. A model for resolving this problem is set in the following spreadsheet (cf. Table 3).

Table 3. Spreadsheet model for organizing additional employee training

	A	B	C	D	E	F	G
1			Number of	Number of			
2			possible candidates	sent candidates			
3		MC_I	30	0	0	0	0
4		MC_II	20	0	0	0	0
5					0	0	0
6					10	24	16
7							
8					Z1	Z2	Z3
9					500	800	1000
10		Total			400	750	1200
11		training costs	0		0	0	0

The costs for additional training of workers in three required occupations are put in the table in address area E9:G11 for training in Manufacturing company I and in address area E10:G12 for training in Manufacturing company II. The maximum number of employees that each company can take can be found in the address fields C3 and C4. The number of candidates to be trained for a particular occupation has been entered in the address fields E6, F6 and G6. The formula = SUM (E3: G3) which calculates the number of workers to be sent for training in MC_I is glued to the address field D3 and the formula = SUM (E4: G4) which calculates the number of workers to be sent for training at MC_I is glued to the address field D4I. The training costs for each individual occupation are calculated in the address area E11: G11. First of all, the formula = SUMPRODUCT (E3: E4; E9: E10) is glued to the address field E11 and then copied to the rest of the address area. The total training costs are calculated as the sum of the individual costs in the address field C11 where the formula = SUM (E11: G11) is glued. Then the address area E3: G4 is necessary to book where the initial null values must be entered. These are at the same time a decision-making variables which will include the answer to the question how many workers and what occupations they would be trained for in MC_I and MC_II.

In Tools menu we choose programme Solver and start to fill in the data in the Solver Parameters as shown:

Target Cell: C17

Equal to min

By Changing Cells: E3:G4

Subject to the Constrains:

E3:G4 =integer

E3:G4 \geq 0

D3:D4 \geq C3:C4

E5:G5 =E6:G6

When all the data is filled in, we click on the solve button in solver parameters. This will activate solver programme to calculate decision variable values in address sequence E3:G4. Decision variables that are calculated in address sequence E3:G4 define the optimal solution. Table 4 shows the optimal solution to the problem by using MS Excel.

Table 4. Optimal training program for workers in foreign production companies

	A	B	C	D	E	F	G
1			Number of	Number of			
2			possible candidates	sent candidates			
3		MC_I	30	30	0	14	16
4		MC_II	20	20	10	10	0
5					10	24	16
6					10	24	16
7							
8					Z1	Z2	Z3
9					500	800	1000
10		Total			400	750	1200
11		training costs	38700,00		4000	18700	16000

Using optimal training program for workers abroad, 10 Z₁ candidates and 10 Z₂ candidates are to be sent to the MC_II manufacturing company, while 14 Z₂ candidates and 16 Z₃ candidates should go to the MC_I manufacturing company. The minimum

cost of training amounts to €38,700. The obtained results offer savings of € 4,500. This savings are very important because ensure carefully managed training budget needs.

5. CONCLUSION

In the knowledge economy companies should improve its capacity to acquire, share and use knowledge in ways that improve its survival, success and ensure dynamic stability. This process is possible only with the development of the organization learning concept. Organizational learning means that companies establish systems, structures and organization values that support the knowledge management process. Employees need to recognize that it is essential for them to continue to learn so that they will be effective in their current jobs and to move into other positions. There are two types of knowledge that employees need to be successful at workplace: 1) explicit knowledge and 2) tacit knowledge. Personal knowledge can become organizational knowledge through the dynamic interaction between tacit knowledge and explicit knowledge. Creating, acquiring and effectively developing knowledge within an organization has become the core source of competitive advantage. That is a reason why companies are getting more interested to invest in people, knowledge and learning. Dynamic business environment requires continuous investment in the training process and employee development, as well as the need to optimize the resources used for this purpose. The funds for education of employees are growing rapidly, indicating the companies commitment to improving the process of acquiring knowledge, skills and other competence. Future research should continue to examine human capital issues as a factor of achieving dynamic stability in different stage of company's business cycle in SMEs and large enterprises.

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ACKNOWLEDGMENTS

Some parts of the paper have been presented at the 3rd International Scientific Conference – EMAN 2019

ELECTRONIZATION IN HEALTH CARE AND PRIVACY PROTECTION

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ABSTRACT

The paper examines the issue arising when delivering healthcare in the modern information society. Throughout the past decade, the Internet has seen a significant rise of the "Web 2.0" trend, which carried on its wings a health industry trend often referred to as "Health 2.0" or "Medicine 2.0". More recently, we have also witnessed crowning of concepts such as Health Social Media, eHealth and mHealth. WHO as well as the national states develop strategies implementing new technologies for personal and medical data sharing, including the prescription of medicals, as well as their validation through the Internet and web sites. Many national and supranational medical registries have been brought out. The paper highlights the advantages of the openness and collaborative nature of modern technologies for exchange of medical information. The paper also points out that general benefits come along with multiple risk for the privacy of patients as well as medical professionals. The paper also warns that there are many people who do not either have access to modern technologies or they avoid using them or they are just afraid of them. These patients will not have equal access to medical care. There are many professionals, especially general practitioners of the older generation, who has already closed or will close their practice due to the fear of an unaccustomed and dehumanized means of communication and so even in very developed countries the inhabitants out of big cities could be excluded from a daily medical care.

KEYWORDS: Digitization, Health care, Privacy protection, E-health.

JEL CLASSIFICATION: K32, I18

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1. INTRODUCTION

Health is considered a fundamental human right that is the basis for the exercise of other human rights and is essential for a dignified life. An **effective system of health** care provision is a crucial institution within a society, one which carries the same significance as the justice and democratic political system.

Both contemporary theory and practice speak about a **global information technology society**, which takes many forms. Its specific types and characteristics also depend on historical and geographical conditions (Wilson, Kellerman, Corey, 2013). In healthcare, the issue of transitioning to a modern information society is closely linked with the development of the Internet. In the past decade, we have seen on the world wide web a significant rise of the "Web 2.0" trend, which carried on its wings a health industry trend often referred to as "Health 2.0" or "Medicine 2.0". More recently, we have also witnessed crowning of concepts such as Health Social Media, eHealth and mHealth (Sovova, Sova, 2017). WHO as well as the national states develop strategies implementing new technologies for personal and medical data sharing, including the prescription of medicals, as well as their validation through the Internet and web sites. Many national and supranational medical registries have been brought out. All these technologies bring the advantages of the openness and collaborative nature of for exchange of medical information on one hand. On the other hand, they are closely connected with the risks for protection of personality and privacy of the patient in general and with safety of health care provision. Fear of abuse of sensitive data and confidentiality are of a particular significance in medical care. Though national states have a wide margin of appreciation how to protect privacy when delivering the healthcare, many common issues arise in the modern global technology society. There are legal and other measures aimed at protecting and promoting the interest of a patient in the global health policy (Tasioulas, Vayena, 2016).

What are the demands of law and equity applicable to global health policy?

By global health policy we mean those practical measures, whether adopted and implemented by international organizations, states, corporations, or agents of some other kind, that have as their ultimate goal, in the words of the World Health Organization's evocative motto, "health for all." They are legal and other measures aimed at protecting and promoting the interest in health of every human being around

the globe. This Paper aims to point out and examine the mentioned issues based on the introduction of the National e-Health Strategy of the Czech Republic¹.

2. PRIVACY PROTECTION

The right to health does not only concern the provision of health care, in the European context usually by public insurance, but also the human right when seeking health services not to become a mere faceless object within a system administered by the state or by other authorities. In order to **ensure the right to health** it is also necessary to identify the individual's subjective right to participate in the care of their health. It is necessary to discuss whether constitutionally legal dimensions of the right to health entails the right to participate in health care, or even the simultaneous right and duty to accept sole responsibility for deciding on one's health. Every person has the right to decide who will care about his health and exactly how it will be managed, however along with this right, the individual's own decision must not jeopardize the health of others as a legally protected interest.

Privacy protection when delivering healthcare has two dimensions. The first one - **privacy** - means gathering information. The second one - **confidentiality** - is related to sharing information. Both notions overlap in healthcare. Generally, the European concept of privacy protection focuses on the protection of dignity of any human being. The Czech Republic ratified the Convention on Biomedicine², and as a member of the European Union is bound by the General Data Protection Regulation (GDPR)³. The domestic legislation, especially the Act of Health Services⁴, stipulates not only for privacy protection, but also for the obligation of professional confidentiality of medical professionals.

¹ See <https://www.databaze-strategie.cz/cz/mzd/strategie/narodni-strategie-elektronickeho-zdravotnictvi-2016-2020?typ=struktura>

² The Convention for the Protection of Human Rights and Dignity of the Human Being with regard to the Application of Biology and Medicine. Act No. 96/2001 Coll. of |International Treaties

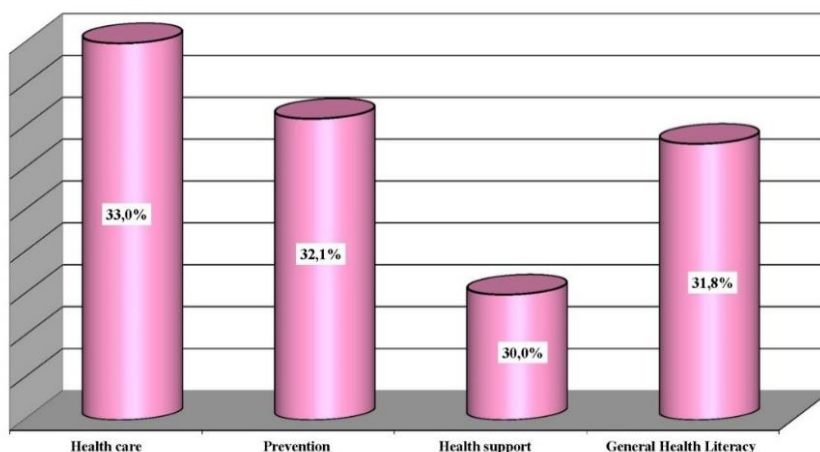
³ Regulation (EU) 2016/679 of the European Parliament and of the Council of 27 April 2016 on the protection of natural persons with regard to the processing of personal data and on the free movement of such data, and repealing Directive 95/46/EC (General Data Protection Regulation) ELI: <http://data.europa.eu/eli/reg/2016/679/oj>.

⁴ Law No. 372/2011 Coll.

3. E-HEALTH STRATEGY – BENEFITS AND RISKS

In the Czech Republic (CZ), as well in some EU countries, the health of residents is still not understood as of the highest value and interest. On the one hand, life expectancy in general has been extended, but on the other the years of healthy life have not been extended. The health literacy of Czech citizens is also quite low, as the data collected in 2014 show.⁵

Graph No. 1 Health Literacy in the Czech Republic

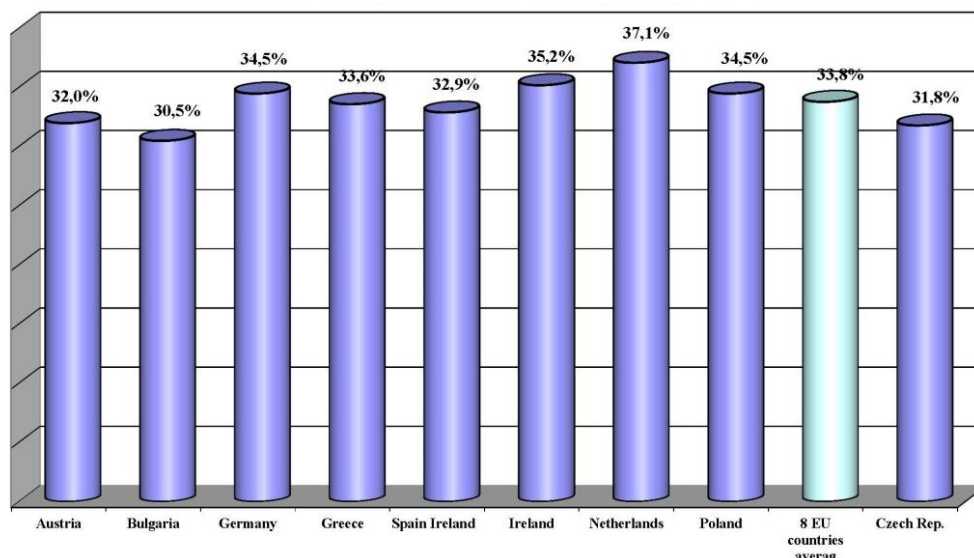


Source: National Institute of Public Health, CZ (2018)

Graph No. 1 demonstrates that only about 30-31 % of adults are interested in getting information and support in their daily healthcare matters. The same percentage appears when comparing the data with selected EU countries in Graph No. 2. The survey was one of the bases for developing the strategy Health 2020, as described below.

⁵ See on web sites of The National Institute of Public Health:
http://www.szu.cz/uploads/documents/czpz/Efektivni_strategie_podpory_zdravi_18062015/Zdravotni_gramotnost_ceske_populace_Vysledky_reprezentativniho_setreni.pdf?highlightWords=zdravotn%C3%AD+gramotnost+%C4%8CR

Graph 2 Health Literacy in the Czech Republic in comparison with selected EU countries



Source: National Institute of Public Health, CZ (2018)

Health 2020 – National Strategy for Health Protection and Promotion and Disease Prevention (Strategy) stated. *“The main objective of the National Strategy is to improve the health of the Czech population and reduce the incidence of preventable diseases and premature deaths. Its main vision is to further develop the public health system, stabilize the system of disease prevention, health protection and promotion, and to kick-start efficient mechanisms to improve public health.”*⁶ The Strategy indicates the future direction of the development of public health services on a global and European level. In contrast to the concept of the patient-doctor relationship based on private principles, the plan places emphasis on reducing inequalities within health care and public health services. The aim of the policy is *“[...] to create a sustainable health system based on quality, affordability and the principle of equal status of people as partners in achieving better health for all.”*⁷

Electronic tools, supporting the exchange of information and reducing costs not only of the healthcare, but also of necessary records and registers needed for the above-mentioned sustainable health system are described in The National e-Health

⁶ Approved by Government Resolution No. 23 dated 8. 1. 2014. Health 2020 – National Strategy for Health Protection and Promotion and Disease Prevention.
http://www.mzcr.cz/verejne/dokumenty/zdravi-2020-narodni-strategie-ochrany-a-podpory-zdravi-a-prevence-nemoci_8690_3016_5.html

⁷ National Strategy for Health Protection and Promotion and Disease Prevention.
http://www.mzcr.cz/verejne/dokumenty/zdravi-2020-narodni-strategie-ochrany-a-podpory-zdravi-a-prevence-nemoci_8690_3016_5.html

Strategy of the Czech Republic 2016-2020 (e-Health Strategy)⁸. The digitization and the electronic exchange of data and other medical information form the most important tools for implementing the e-Health Strategy.

The state supports the project **Information and data interface** which will enable exchange information among providers and medical professionals⁹. Medical doctors are obliged to **prescribe** medicaments on electronic formula, which is accessible for the pharmacist at a central data storage. The patient must either have a smartphone or gets the prescription printed.

Medical files could be recorded electronically, on the paper or both ways.

The main benefit of above - mentioned first steps in e-health is the quick accessibility is the quick accessibility of all information anytime. The information could not be reached anywhere as there is lack of internet connection in some regions. The state medical information highway should be highly protected from hackers or destruction.

The risk is hidden in human factor. The public officer must always be substitutable, so there will be many clerks with same rights for access. Providers often enable the access to electronic records for too many employees and passwords are shared. Patients open health and personal information on social networks because they want to get more information about their health issues. Some of them are always ready to exchange their privacy for better resources for medical treatment, so they provide their data without necessary caution.

Some **social media offer public-facing physicians' profiles**, like Doximity. The other enable to share pictures and discuss diagnosis - Figure 1 or Quantia MD. Sermo enables registration just for licensed physicians and there is a strict code of conduct and a secure verification process for all members. The world-renowned Mayo Clinic created own network to promote global health. The basic membership provides information for medical students, patients, advocates, and providers¹⁰.

⁸ See <https://www.databaze-strategie.cz/cz/mzd/strategie/narodni-strategie-elektronickeho-zdravotnictvi-2016-2020?typ=struktura>

⁹ See <http://www.uzis.cz/en/node/8041>

¹⁰ See <https://www.remindercall.com/social-media-sites-for-healthcare-providers/>.

4. CONCLUSION

E-health and electronic exchange of information bring better and quicker accessibility, help to create health literacy, which is very much required, especially in the Czech Republic. Language skills of younger patients enable them to find out information worldwide. This could be dangerous, because some overseas methods of treatment, medicals or devices are not approved or allowed in EU. On the other hand, older patients or patients with chronic diseases consider themselves excluded from the latest achievements and possibilities of modern medicine as there is not an adequate electronic infrastructure to coordinate the care¹¹.

Still there are patients who want to see their doctor face to face and exchange information personally. Many inhabitants, practitioners, pediatricians or dentists in provinces or mountains do not have good access to internet and electronic devices or they are not able to work properly with them or do not want to because of the fear of an unaccustomed and dehumanized means of communication.

Compulsory digitization in medicine and medical services could lead and have led to closing of medical offices, even in bigger cities. **Issues, that should be examined** with the development of digitization in healthcare are especially privacy and confidentiality protection, data exchange among healthcare providers, medical professionals and patients and the accessibility of e-health services for all.

The main challenge to be addressed is to find the **appropriate research methodology**, which should include the approach usable in the daily legal, managerial and medical practice, too. The methodology of **new governance** which is based on collaboration, experimentation, adaptation and flexibility, is not coercive. A fundamental precept of this methodology is that there is not only one direction from which to proceed, i.e. not only one-way to solve public problems. Another significant aspect of this perspective is the assumption that great methodological emphasis should be placed on exploring local conditions and idiosyncrasies since solutions are

¹¹ See https://catalyst.nejm.org/treating-chronic-disease-telehealth-remote-monitoring/?utm_campaign=Connect%20Weekly&utm_source=hs_email&utm_medium=email&utm_content=77541927&_hsenc=p2ANqtz--VVDwCpXSCysPz1GT-WTnqid8YQJngaXcc3c0ecXLC8nJ6S1xoKgJbEVPh2X5GJjBo1WKjrRnoRVEIV9MiktE_xfqtw&_hsmi=77541927

first and foremost to be found in the community in question¹². Despite the fact, that the concept of governance in the public sphere is still contested and examined, we would suggest this methodology as it includes different type of values, policy-making processes as well as various public and private stakeholders¹³.

The right to health is a fundamental human entitlement, the specific character of which is determined by the boundaries of the legal regulations and these regulations must not menace its substance – the relationship patient-doctor and the availability of medical services.

¹² Sovova, O. : Current Research Issues in Regarding Health as a Fundamental Human Right . (October 1, 2017). *Charles University in Prague Faculty of Law Research Paper No. 2017/III/2*.

¹³ Boivard, T: Public governance: balancing stakeholder power in a network society. *International Review of Administrative Sciences*. 71_2. 2015, pp. 217-228.

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Laws:

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- Regulation (EU) 2016/679 of the European Parliament and of the Council of 27 April 2016 on the protection of natural persons with regard to the processing of personal data and on the free movement of such data, and repealing Directive 95/46/EC (General Data Protection Regulation) ELI: <http://data.europa.eu/eli/reg/2016/679/oj>.
- Law No. 372/2011 Coll., on Health Services, Czech Republic

Acknowledgements: This paper has been supported by the Police Academy of the Czech Republic in Prague. Substantial parts of the paper have been presented at the 3rd International Scientific Conference - EMAN 2018 (<http://www.eman-conference.org>)

USING SOCIAL MEDIA AS A CHANNEL OF DIGITAL MARKETING IN TOURISM SECTOR IN BOSNIA AND HERZEGOVINA

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ABSTRACT

Tourism has a perspective to be a significant factor in economic growth some countries because it contributes prominently in GDP and creating new jobs. Today, tourism in Bosnia and Herzegovina (BiH) is a rapidly growing sector with great potential for further growth and development. Social media are the most popular channel of digital marketing. Facebook and Instagram because of their great popularity in BiH and a very large number of users, can serve as a useful source of information for potential travelers when choosing a holiday destination and planning a trip. Meta-search engines such as TripAdvisor, Trivago and Booking are using features of social media to their intermediation platforms for comparing prices between tourist destinations, for posting customer's reviews, photos or videos of the destination and help travelers to select the best booking option. This paper points to the need for further development of information and communication infrastructure in BiH as a necessary prerequisite for further development of social networks, which also increase importance of social media in development of the tourism sector. A comparison of the situation in BiH with the countries in the region with respect to key indicators important for the development of tourism will be made also.

KEYWORDS: social media, ICT infrastructure, Travel & Tourism Competitiveness Index

JEL CLASSIFICATION: L86, L88, L96, Z32

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1. INTRODUCTION

Tourism can be an important source of revenue and employment generator. A report by the World Travel & Tourism Council for 2017, indicated that this sector accounts for "10.4 percent of the global gross domestic product (GDP) and that it employs 9.9 percent of the world's workforce", (WEF, 2017). That research shows that for every 30 new tourists to a destination one new job is created.

The Internet has fundamentally reshaped the way tourism-related information is distributed and the way people plan for and consumes travel, (Buhalis and Law, 2008). Search-engine has become a powerful interface that serves as the gateway to travel-related information as well as an important marketing channel through which destination and tourism enterprises can reach and persuade potential visitors (Xsiang, Wober and Fesenmaier, 2008). Search-engine directly and indirectly promotes social media to travel information search, (Xsiang and Gretzel, 2009).

Digital marketing or e-marketing, is marketing of products or services using digital technologies, mainly on the Internet, but also including mobile phones, display advertising, and any other digital medium. Digital marketing is part of integrated marketing communications that takes place on digital platforms, specifically on web portals, mobile devices, social media, search engines and televisions.

This paper is focused on social media and its role as marketing tool in tourism sector, (Queensland, 2016). Some of the features that make social media suitable for marketing are:

- Broad reach: social media can reach a millions people around the world,
- ability to target particular group,
- better understanding of the costumers needs and better relationship with the costumer,
- free or low cost,
- personal: possibility to communicate on personal basis with individuals or groups,
- fast: you can quickly distribute information to many people
- easy: you don't need high level skills or compute requirement to participate on social media,

Social media marketing is a strategic and methodical process to establish the company's influence, reputation and brand within communities of potential customers, readers or supporters.

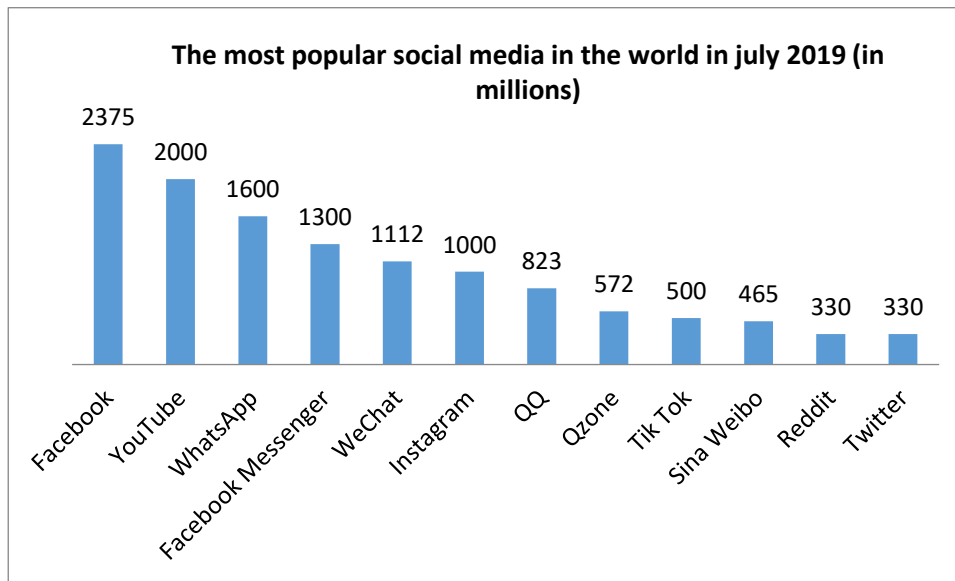
Social media and Tourism industry Statistics in 2012 have highlighted increasing role of social media (Jashi, 2013):

- 40% of online travelers visit social networking sites to influence destination selection
- 87% said reviews impacted hotel choice
- 84% said reviews impacted method of travel
- 78% said reviews impacted choice of dining
- 70% of consumers trust online recommendations while only 14% trust advertisements
- 50% of blog readers read travel blogs
- 57% of travel-related website visitors read traveler-written reviews

2. USING SOCIAL MEDIA FOR POPULARIZATION OF TOURISM

Any website which allows user to share their content, opinions, views and encourages interaction and community building can be classified as a social media. Social media uses web-based technologies to turn communication into interactive dialogues. Andreas Kaplan and Michael Haenlein define social media as "a group of Internet-based applications that build on the ideological and technological foundations of Web 2.0, which allows the creation and exchange of user-generated content," (Kaplan and Haenlein, 2010). In the figure 1 is shown the most popular social media in the world.

Figure 1. The most popular social media in the world



Source: <https://www.statista.com/statistics/272014/global-social-networks-ranked-by-number-of-users/>

In the tourism, the importance of social media technologies has increased in shaping competition because online retailers such as Expedia, Trivago TripAdvisor and Booking.com have added progressively features typical of social media and online communities to their intermediation platforms where travelers can compare prices and customer reviews for hotels and destinations, (Neirotti, Raguseo and Paolucci, 2016) and (Kietzmann, Hermkens, McCarthy and Silvestre, 2011)

Greater Internet visibility that hotels can develop on social media platform or through social media features on online retailer's infomediaion platforms might provide smaller hotels with opportunities for market growth in which they have limited market presence (Triem and Leonardi, 2012). Hotels can respond strategically to online reviews by increasing or reducing price in the case of positive or negative reviews respectively, (Kwark, Chen, and Raghunathan, 2014).

2.1. The importance of ICT development

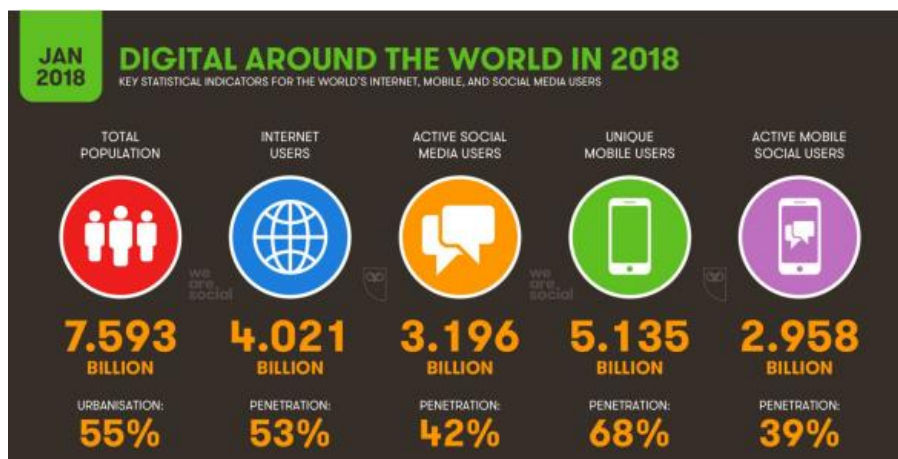
The development of information and communication technologies (ICT) has great impact on our daily life. Many people, especially the youth, use ICT on a daily basis for various purposes. People use computers (desktop, laptop, tablet and notebook), cellphones and smartphones to study, to play games, for communications,

for social networking, to search for information on the Internet (maybe for travel planning) and etc, (Stojanovic, 2018).

According to the International Telecommunication Union (ITU-International Telecommunication Union), the following indicators are taken as key indicators of a country's IT development: penetration of fixed users (number of users per 100 inhabitants), penetration of mobile users and number of Internet users, (ITU, 2017).

As the Fourth Industrial Revolution expands, digital is increasingly becoming a basic requirement to be competitive across the Travel and Tourism (T&T) industry, (WEF, 2017).

Figure 2. The trend of increasing Internet users and social network users



Source: <https://wearesocial.com/special-reports/digital-in-2018-global-overview>

This huge penetration of the number of Internet users, social network users and mobile network users (Figure 2) will inevitably lead to the transformation of the way people access, experience, use and share information. Internet has become a great mechanism to enable travelers to connect directly without relying on intermediaries hence business model for T&T sector have to change accordingly, (WEF, 2017).

3. SITUATION IN BiH IN TOURISM SECTOR

The calculation of the direct and indirect benefits that Bosnia and Herzegovina has from tourism relies on several parameters. Thus, the direct contribution of tourism to the economy includes the spending of tourists on accommodation, transport, entertainment, attractions, food, cultural and sports activities, shopping and a number of other items.

Indirect benefits and financial benefits that are counted for the benefit of tourism include the investments of companies and individuals in tourism, the money spent by the government on tourism related services and the procurement of companies and the state for the purposes of work in the tourism sector.

The direct contribution of Travel & Tourism to GDP in 2017 was 799.7 million of convertible marks (BAM). That is 2.6% of GDP. This is forecast to rise by 5.1% to BAM840.6mn in 2018, [1].

The total contribution of Travel & Tourism to GDP (including wider effects from investment, the supply chain and induced income impacts, seepage 2) was BAM2,944.5mn in 2017 (9.6% of GDP) and is expected to grow by 5.4% to BAM3,103.4mn (9.9% of GDP) in 2018. It is forecast to rise by 5.4% to BAM 5, 231.8mn by 2028 (12.6% of GDP), (WEF, 2017).

Travel & Tourism generated 23,000 jobs directly in 2017 (3.2% of total employment) and this is forecast to grow by 2.7% in 2018 to 24,000(3.3% of total employment). This includes employment by hotels, travel agents, airlines and other passenger transportation services(excluding commuter services). It also includes, for example, the activities of the restaurant and leisure industries directly supported by tourists,[1]. By 2028, Travel & Tourism will account for 30,000 jobs directly, an increase of 2.2% pa over the next ten years, (WEF, 2017). The total contribution of Travel & Tourism to employment (including wider effects from investment, the supply chain and induced income impacts, was 81,500 jobs in 2017 (11.2% of total employment). This is forecast to rise by 2.8% in 2018 to 83,500 jobs (11.4% of total employment), (WEF, 2017). By 2028, Travel & Tourism is forecast to support 103,000 jobs (15.2% of total employment), an increase of 2.1% over the period.

3.1 Comparison of the situation in BiH with the countries in the region accordance to the key tourist indicators

The Travel & Tourism Competitiveness Index (TTCI) measures “the set of factors and policies that enable the sustainable development of the Travel & Tourism sector, which, in turn, contributes to the development and competitiveness of a country”, (WEF, 2017).

These factors are: business environment, safety and security, health and hygiene, human resource and labor market and ICT readiness. All these factors are further divided into pillars as it can be seen in tables below. In the next two tables is made comparison situation in BiH with the countries in the regions accordingly with the factors mentions before.

Table 1. Enabling environment

Country	Global rank	Enabling environment				
		Business environment	Safety and security	Health and hygiene	Human resource and labour market	ICT readiness
Croatia	32	4	6.1	6.4	4.4	5
Slovenia	41	4.3	6.2	6	4.9	5.2
Montenegro	72	4.4	5.4	5.8	4.5	4.8
Macedonia FYR	89	4.8	5.6	6	4.4	4.6
Serbia	95	4	5.4	6	4.4	4.8
Bosnia and Herzegovina	113	3.5	5.4	5.7	4.2	4.3

Source: WEF report

Table 2. T&T policy and enabling conditions, infrastructure, natural and cultural resources

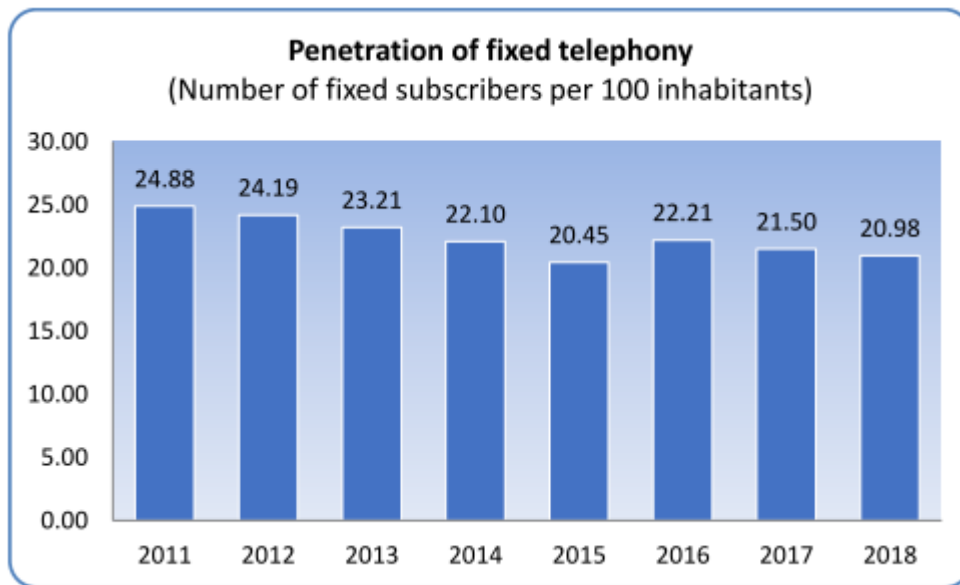
Country	T&T policy and enabling conditions				Infrastructure			Natural and cultural resources	
	Prioritization of T&T	International openness	Price competitiveness	Environmental sustainability	Air transport infrastructure	Ground and port infrastructure	Tourist service infrastructure	Natural resources	Cultural resources & business travel
Croatia	4.5	4.2	4.4	4.7	3	3.9	6.3	4.5	2.8
Slovenia	4.8	3.7	4.6	5.1	2.5	4.8	5.4	3.8	1.5
Montenegro	4.6	2.4	4.8	4.3	3	3.2	5.4	2.6	1.1
Macedonia FYR	4.3	2.6	5.2	3.7	2.2	3.3	4	2.1	1.4
Serbia	3.6	2.4	4.8	4.2	2.4	2.8	3.9	2	1.7
Bosnia and Herzegovina	3.7	2.4	4.3	3.9	1.8	2.5	3.9	1.8	1.4

Source: WEF report

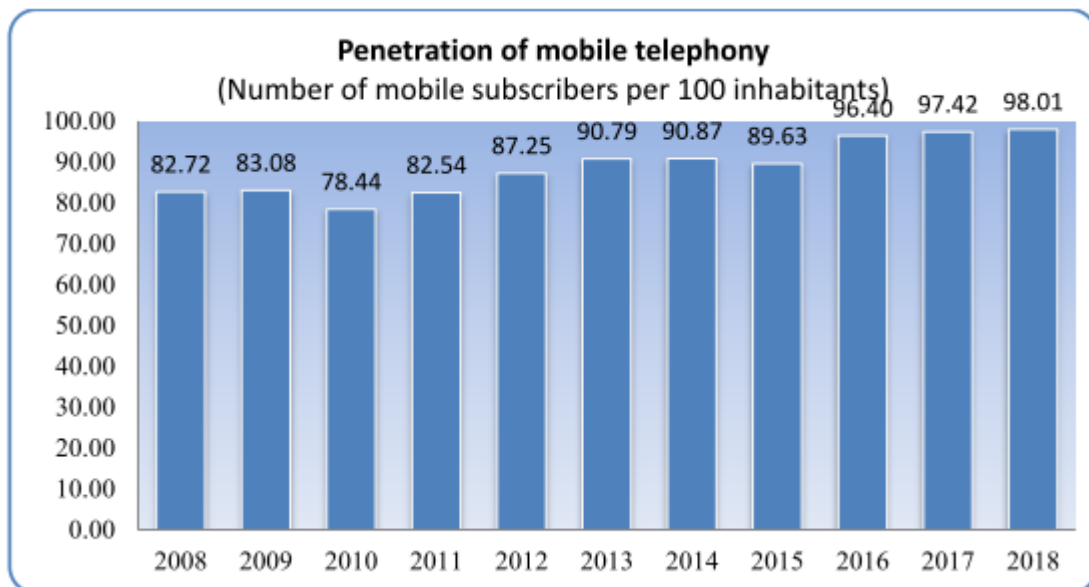
3.2. ICT indicators in BiH

From Figure 3, it can be seen that Bosnia has good ICT indicators: penetration of fixed and mobile telephony and penetrations of Internet users (CRA, 2018). It is important, because good ICT infrastructure allows users to access social media, regardless of whether they used fixed or mobile networks

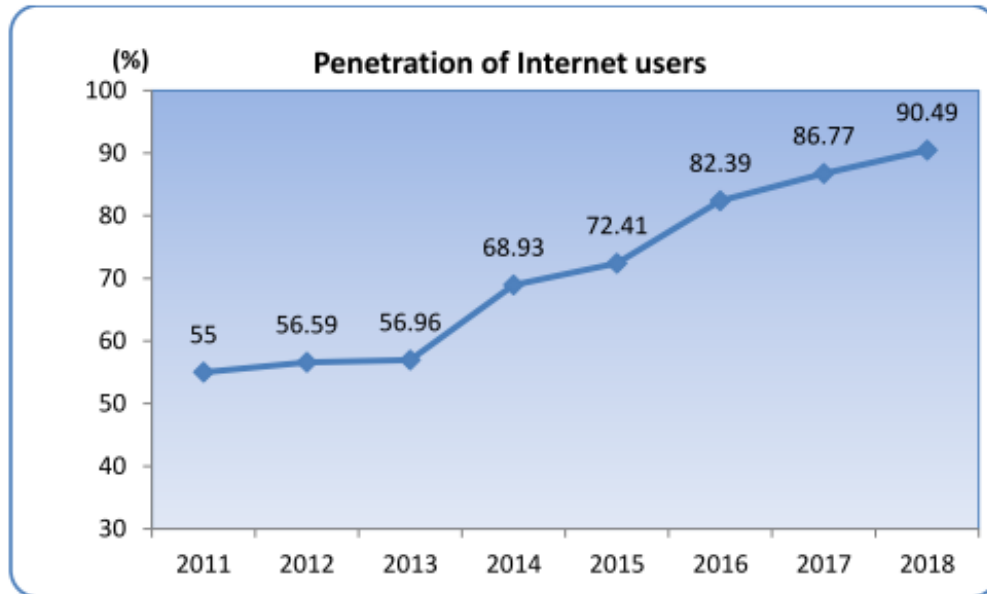
Figure 3. ICT indicators in BiH are: (a) penetration of fixed telephony (b) Mobile telephony penetration (c) Penetration of Internet users



(a)



(b)



(c)

Source: <https://www.rak.ba/en/reports>

The two most popular social media in the BiH are Facebook and Instagram (Figure 4 and Figure 5). There were 1 619 000 Facebook users in Bosnia and Herzegovina in January 2019, which accounted for 46,3 of its entire population and there were 889 900 Instagram users in Bosnia and Herzegovina in January 2019, which accounted for 25.4% of its entire population.

Figure 4. Facebook users in Bosnia and Herzegovina

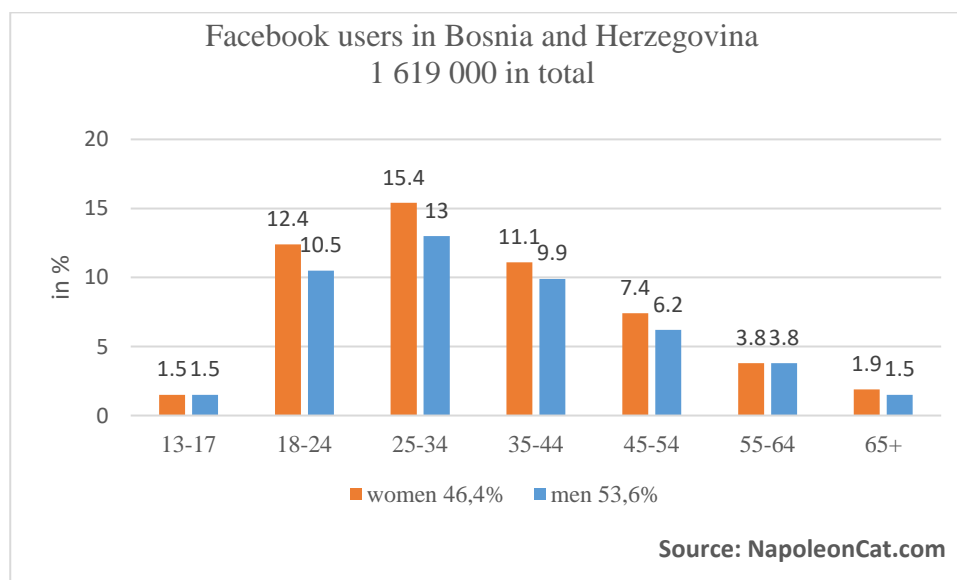
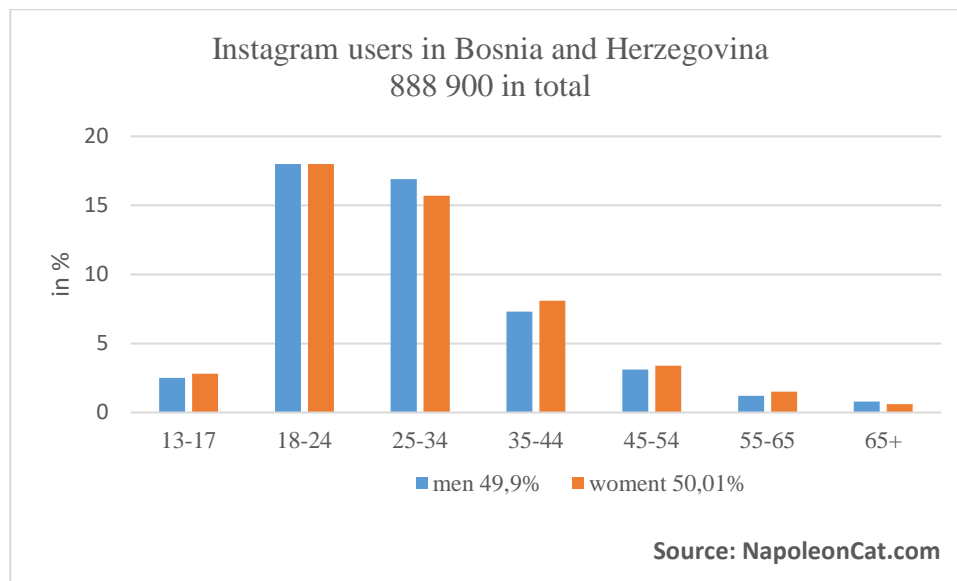


Figure 5. Instagram users in Bosnia and Herzegovina



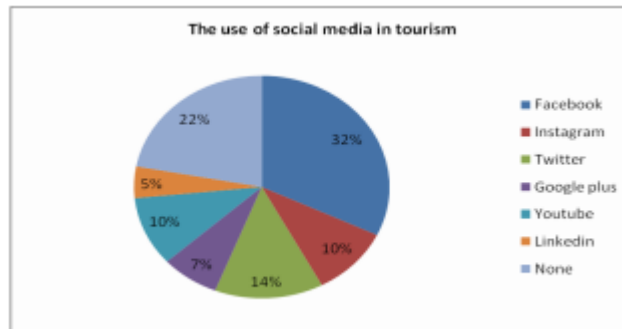
Source: <https://napoleoncat.com/stats/>

Such a large number of users of social media makes it suitable ground for advertising, but is this case in the BiH?

Current level of development of tourism best illustrates BiH's position in the WEF's (World Economic Forum) annual report for 2016/2017. Report for 2016/2017 year covers 136 economies and BiH is on the 113 position in it, (WEF, 2017).

With regard to the tourism potentials of Bosnia, this place is very bad. Part of the responsibility lies with the travel agencies, which have to find new ways to reach the tourists. One way would be to have more representation on social media. If we look at the leading tourist portal in BiH <http://www.visitmycountry.net>, we can see that it contains links to 94 sites of travel agencies. Immediately we can see that some links are duplicated, and a simple check has found that as many as 25 links do not work. By further checking, through access to all links of remaining travel agencies, we could draw conclusions about the popularity of certain social media in the BiH (Figure 6) in the tourist domain, (Stojanović, 2018).

Figure 6. Popularity of social media in tourism in BiH



Source: Own research

4 CONCLUSION

As can be seen from Table 1 and Table 2, there are several factors that have an impact on the development of tourism, and the work on their improvement depends largely on the activities of state authorities. The state should do everything in its power to better position BiH as a desirable tourist destination in the global world market. In addition to the state administration itself, one part of the responsibility for the further advancement of tourism in Bosnia and Herzegovina lies in the hotels and restaurants that have to do more on their own marketing. A good, planned approach to social media, such as Facebook and Instagram (because it is the most popular social media in Bosnia and Herzegovina), will make that a lot of of tourist destinations in Bosnia will become much more visible. This will lead to better occupancy of accommodation capacities, higher incomes, which will ultimately have a positive impact on the growth of the overall economy. Social media is an innovative tool that enables better interaction of tourist workers with guests, quicker response to their requests and complaints. Social media is an innovative tool that enables better interaction of tourist workers with guests, quicker response to their requests and complaints and can certainly positively influence on the building of a brand of some touristic destinations.

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ACKNOWLEDGMENTS

Some parts of the paper have been presented at the 3rd International Scientific Conference – EMAN 2019 (<http://www.eman-conference.org>).

