

E-COMMERCE IN THE LIGHT OF THE FOURTH INDUSTRIAL REVOLUTION

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Abstract: *A new industrial revolution has begun. The development of digital technology as well as the implementation of advanced technologies, primarily in the manufacturing processes of the industry, all with the changes that are taking place at the global level of the economy imposed by the fourth industrial revolution (Industry 4.0). The fourth industrial revolution implies changes in artificial intelligence, automotive industry, robotics, nanotechnology, quantum computers, e-commerce, etc. Also, the fourth industrial revolution means changes in the sectors of economy that use or produce innovative or new technologies, and where information-communication technologies are tools in creating virtual-digital channels of trade in which the trade is performed without business partners ever seeing each other. It took 75 years for the phone to start being used by 50 million people around the world, for the television it was about 13 years, while the Internet took only 4 years. The aim of the paper is to show that the successful functioning of the concept of e-commerce in the era of daily changes on a global level requires understanding of Internet technology, as well as Web and mobile platforms that make up the electronic commerce infrastructure. From the spectrum of innovations brought by Internet, the authors have chosen to explore the Internet as a platform for relocating trade to the digital network, on the one hand, and as a foundation for the development of new models of trade, better known in theory and practice as virtual trade, e-commerce, on the other hand.*

Key words: *electronic commerce, internet, digital network, information-communication technologies, industry 4.0.*

"Even John Maynard Keynes predicted that robotics would enter all aspects of life in 100 years and that it would be enough for a man to work only three hours a day."

"Despite the many unknowns about what technological changes of the "new digital web economy" and Industry 4.0 bring us, one thing is already certain: robots and men are already colleagues.

The robot or the cashier?

The final decision will be made by the men. This is logical given that e-commerce is created by the people for the people."

INTRODUCTION

Due to increased globalization of the market and economic regionalization, business cannot succeed without the use of new information and communication technologies (ICT). The development of the Internet has led to a certain reengineering regarding the method and efficiency of the business systems operation. On the other hand, the Internet has become a platform for creating and executing the marketing management business strategy. A certain electronic-digital-web transformation of the traditional method of doing business develops to meet the challenges of the Industry 4.0. Among other innovations, electronic-digital-virtual traffic channels are being developed,

thus eliminating the geographical and linguistic barriers between the trade chain participants. Simple and fast communication, almost instantaneous transmission of large amounts of data over long distances, continuous global availability of multimedia documents, digital delivery of goods and services, direct online payment, etc. were now enabled.

This research contribution was created on the platform of innovations brought by the fourth technological industry. While relying on the methodology of the scientific research paper on the one hand, and standards for the writing of scientific research paper on the other, basic analytical and synthetic methods were applied in the research process.

In our research we put the emphasis on the research of the application of information and communication technologies in trade. Our choice is not random. There are more reasons for this. The key reason is that ICT lead to transformation of all sales channels participants. Companies such as Sears, Amazon.com, Walmart, Marks & Spencer etc. must embrace the new challenges posed by new information and communications technologies. The authors of this paper, recognizing the innovations that ICT bring, and at the same time affirming the concept of electronic-virtual trade, have recognized the Internet as a major tool of ICT in the new technological and industrial cycle. In doing so, we started our research from the fact that if we look at the development of e-commerce we can conclude that so far it was neither smooth nor painless, which gave us reason to conclude that this will not change in the future, because every stage of technological development has its priorities. With the creation of the Internet and the development of new Internet technologies, web platforms, web applications, m-commerce and social networks commerce, new opportunities for the development of e-commerce are created. Technical and technological improvements in the digital industry and computing have lead to the creation of artificial intelligence, robots and automation, which become the leading designers of the digital economy and society. The World Bank stated the following: "Some jobs will disappear due to automation and other jobs will not be created". Many companies have downsized regarding the employees number since robots entered their manufacturing facility. For example, Foxconn Technology Group, an Asian manufacturer of Apple products, has cut its employees number by a third from 2012 to 2016, i.e. more than 400,000 workers were fired due to automation. Artificial intelligence and robots are changing the traditional concept of doing business on the one hand, and affirming the new concept of digitized enterprise

on the other. Many companies are already using the artificial intelligence. For example, the Walmart company plans to enrich its fleet with fifteen trucks driven by the artificial intelligence. This is a new industrial revolution, better known as Industry 4.0. Artificial intelligence, robots and automation have allowed the trade to grow in technological and organizational terms.

1. E-commerce as a term with multiple meanings

Defining e-commerce is not easy, because it is a rapidly changing area. E-commerce should not be viewed outside of space and time frames. With the development of information technology, traditional forms of business operation for commercial field main participants started approaching on one hand, and informatics and electronics, on the other. The application of modern informatics and electronics provides many opportunities, not only for trade but for other activities as well. Countries with the developed markets recognize information technology as a resource for increasing the competitive advantage of their companies. Leaving aside the socio-economic, cultural, security, ethical and legal aspects as popular issues, we can conclude that the path has been created for the transition from a resource-driven economy to a digital economy. Based on this, the trade moves from mechanical to electronic stage of development.

Chronologically speaking, e-commerce has evolved in its development. That evolution has come a long way since the launch of Sputnik, which was the herald of the transition of industrial to post-industrial society. With the development of cable and satellite television, an era of global communication emerges. Scientific and technical progress in the field of micro-electronics and the implementation of information and communication systems, such as: EAN, EPOS, EFTPOS, EDI and EDIFACT, leads to reengineering of the commercial field main participants and other participants in the traffic of goods, thus affirming the concept of innovation strategy. Although this strategy brings numerous functional-type innovations in the business operation process of traditional institutions of commerce, with the development of the Internet, new institutions of commerce emerge – and that is e-commerce⁶. New business formats of commerce develop, better known in theory and practice as virtual traffic channels. To illustrate this we could say that in addition to the traditional "brick-and-mortar"

⁶ Ćuzović, S., Sokolov-Mladenović, S., i Ćuzović, Đ. (2012). *Trade in the conditions of internet-web economics (socio-economic assumptions and ethical principles)*. Niš: Economic topics, no. 2, pp. 187-204

business formats, the commerce is developing additional traffic channels, known as "click-and-mortar".

The space in this paper does not allow us to look in more detail at the theoretical and methodological concept of defining and developing e-commerce, towards a new marketing channel in the conditions of the "new-web-Internet economy". We will conclude that this is a new, scientific discipline which begins to develop in the 1990s, while its real expansion started with the use of the Internet in business operation. E-commerce is an area of interdisciplinary character that relies on a range of other sciences and disciplines. E-commerce as a synonym for internet commerce, often called virtual commerce, with its interdisciplinarity with other scientific disciplines, such as: business informatics, distributed marketing, information systems, e-business, application of IT in the economics, e-marketing, etc., is a common subject of discussion among scholars. To conclude the discussion about this segment of research, we emphasize that theorists and practitioners agree that e-commerce and e-business are not synonymous. These are similar, but from theoretical and methodological point of view, on one hand, and marketing and management strategies for designing and actualizing business activities, on the other, these are very different processes.

1.1 Stages in e-commerce development

In the process of e-commerce development we can distinguish two distinguishable stages:

- a) application of information and communication technologies in traditional commerce institutions;
- b) the development of new electronic commerce institutions.

The basis of this differentiation are the innovations brought along with scientific and technical progress. Viewed through this division, the first stage is characterized by the computers application, the development of EAN/GSI systems, EPOS and EFTPOS systems in traditional commerce. With the advent of EDI, EDIFACT standards and the Internet, a new stage of institutional innovation in commerce, known as electronic Internet commerce, emerges. This is how in the developed countries in the 1990s the commerce has grown into a modern market institution with specific characteristics in relation to traditional commerce. In addition to virtual stores, online sellers and buyers; electronic auctions, electronic stock exchanges, electronic fairs and other electronic institutions develop.

Paper business documents are replaced by electronic business documents (e-purchase orders, e-dispatch notes, e-invoices, e-customs declarations, e-waybill, etc.). New e-commerce models develop, such as⁷:

- a) B2B (business-to-business)
- b) B2C (business-to-consumer)
- c) B2A (business-to-administration)
- d) C2A (consumer-to-administration)
- e) C2C (consumer-to-consumer)
- f) C2B (consumer-to-business)
- g) G2C (government-to-consumer) etc.

It is logical that this development of information and communication technologies raises new questions that could not be investigated, analyzed and generalized within the general principles of the traditional economics. Among others, the question of how to standardize e-commerce on the Internet without using expensive VANs as a platform on which EDI functions as the basis of a B2B trading model arises. The problem was partly overcome by the development of EDIFACT standards, and later by the adoption of HTTP transaction protocols and SET security protocols that provide greater B2B commerce security. The research area is extended to the total distribution chain. It becomes clear that e-commerce cannot tolerate the diversity of national standards. It is necessary to standardize the entire telecommunication infrastructure, which will provide a unique language of communication in the marketing channel, starting from searching and presenting the business information, payment system, delivery of goods, to resolving customer complaints.

Standardization of information and communication systems, business documents and flow security is one of the key prerequisites for the development of B2B e-commerce models.

2. The Internet as the latest stage in the development of e-commerce

On the foundation of digital communications networks, state-of-the-art services in the field of electronic data exchange have been developed. The highest level in the development of e-commerce is the global computer network (WWW-World Wide Web), the Internet. There is no ownership of the Internet, which is open to all users provided they meet the technical and commercial connectivity requirements. The service allows the user to quickly transfer multimedia information that can be in the form of text, images, sound, etc.

⁷ Turban, E., Volonino, L., and Wood, G. (2013). *Information Technology for Management-Advancing Sustainable. Profitable Business Growth*. Wiley. New York, pp. 92

On the foundation of the Internet, electronic marketing and e-commerce have developed. Although initially it was difficult to imagine online commerce, B2C electronic retail now becomes a reality. The longevity and further development of virtual commerce will depend on many factors. The limiting factors include: legal regulation, ethical issues, privacy, reengineering of management levels and elimination of transport intermediaries⁸.

2.1 The specifics of online commerce

B2C electronic retail is becoming an increasingly important feature of modern commerce. There is an increasing volume of products that are offered to consumers via their home computers, as well as the number of consumers who make their purchases via this medium. For this reason, companies that strive for continuous improvement of their business are increasingly choosing to appear on the Internet. If at first it was difficult to imagine commerce on the Internet, now it is safe to say that all issues in this regard are a thing of the past and that we are witnessing its great commercialization. Although there are serious concerns that this commercialization could endanger existing freedoms of communication over the Internet over time, it should only ensure its longevity and further development, and the fate of the freedoms achieved will depend on other factors. The limiting factors are the following: legal regulation, ethical issues, privacy, etc.⁹.

E-commerce has become a reality in countries with the developed markets. Our commerce is lagging behind by two to three technological and development cycles compared to the countries with the developed markets. It should be emphasized that the development of e-commerce requires appropriate preconditions: institutional, legal regulation, infrastructure, human resources, etc. Considering these limiting factors, this should not discourage us, but encourage us to engage in contemporary commercial flows. E-commerce today becomes a reality. The sooner we approach it, the faster we will mitigate the technological lagging and integrate leading trading companies into world trade flows.

In electronic retail it is very important for potential sellers, before they start with this business, to consider all the Internet possibilities and to try to fit their business in the unwritten rules of this network.

⁸ Ćuzović, S., i Sokolov-Mladenović, S. (2009). *Improving the quality of electronic service in the function of satisfaction*. Niš: Economic topics, no. 2, pp. 43-58.

⁹ Dennis, C., Fenech, T., and Merriless, B. (2004). *E-Retailing*. London: Routledge, pp. 173-174.

Interface is an important factor contributing to the rise or fall of an e-commerce store. Interface includes everything that a visitor sees when they visit a particular page on the Internet. The task of the interface is to make the visitors interested in the presentation and further guide them through it, and to ensure with its content that they stay interested in this presentation as long as possible.

2.2 Advantages and disadvantages of online selling

Electronic retail is an important segment of channeling goods and services from manufacturers to consumers. On the basis of digital and communication technologies, the network economy is developed and the virtual supply chain is affirmed. The market is globalized, and commerce is internationalized on the basis of information and communication technologies, which remove even the outermost geographical barriers between the trade chain participants. There is a certain competition of international trade chains, which base their competitive recognition and business performances on the innovations brought along with modern informatics and electronics. It is a fortunate circumstance that our commerce is also being digitized, in truth, on the same schedule, but on a different calendar than in countries with the developed markets.

Research shows that the number of users who choose to buy something online is growing. However, there is still a large number of those who visit the websites and browse the products, but do not choose to buy the product for various reasons. One of the ways companies attract new customers is through big sales.

The most commonly mentioned advantage of selling online is cost reduction of renting physical space and paying workers¹⁰. This, of course, does not mean that the space and people who work on website maintenance are not paid for on the Internet, but these costs are significantly lower, since many business activities are automated. This type of business operation also offers great flexibility, as the online store is open 24 hours a day. Buying online is faster, which is a convenience for both buyers and sellers. Customer requests can be responded to faster. In this way, the turnover of the company's capital is also accelerated. As more information is collected about a buyer using the digital method, it can make it much easier to identify the target market as well as further steps in marketing campaigns. In terms of administration, there is less paperwork, and the seller has the opportunity to enter the global

¹⁰ Ćuzović, S., Sokolov-Mladenović, S., i Ćuzović, Đ (2018). *E-commerce (principles, structure, development)* Niš: Faculty of Economics, pp. 93

market, which enables them the process of internationalization.

One of the benefits of e-commerce for the consumer is that they do not have to go out of their house to make a purchase. In doing so, the concept of armchair shopping is affirmed. Generally, product prices are lower online. The consumer is able to shop without the pressure coming from the people in the shop, they can browse and select items without any time limit. The buyer also has the ability to compare the prices of other sellers, simultaneously.

On the other hand, the distrust towards the electronic transactions and insufficient level of data privacy are some of the reasons why people hesitate to place an order online. Another reason is the fear of not delivering the product or delivering the wrong product. As for today's e-commerce situation, what is missing is the socialization component provided by shopping malls, physical contact with the product. From the seller's point of view, physical contact and suggestion can improve the trade, which in the e-commerce world is limited to product information and other products similar to it, offered by competitors. One of the disadvantages that sellers face is the lack of professional staff to build and maintain the platform, as well as the high cost of the equipment. The presented advantages and disadvantages of online selling can be systematized, from the seller's point of view and from the buyer's point of view. Advantages from a seller's point of view are the following:

- the initial cost of opening a store is lower,
- business operating costs are lower,
- fixed costs are lower in the structure of total costs,
- smaller volume of paperwork,
- shortening the customer service process,
- fast conquest of new distant markets,
- increased seller competitiveness,
- shorter traffic channels,
- new business opportunities are arising,
- there are also savings in material costs, etc.

As for the disadvantages from the seller's point of view we can mention the price of the equipment necessary for the implementation of this concept, as well as the lack of professional staff for managing and operating in this form of retail, especially in underdeveloped countries. With the increasing modernization of the education system and its adaptation to current trade trends, this problem is increasingly disappearing and replaced by the method of attracting customers, i.e. the Internet marketing. Direct communication with consumers is required, which requires additional education of sales staff.

From the buyer's point of view, the advantages are the following:

- armchair shopping,
- fast delivery of purchased goods,
- lower product prices,
- more choices of products and sellers,
- the access to product information is easier,
- reducing the cost of purchasing the product,
- the ability to learn about innovation at all times,
- less time is needed for the purchase,
- faster seller's response to buyer's requests,
- easier comparison of prices of products and services, etc.

The disadvantages from the buyer's point of view, are the following:

- the possibility of incorrect delivery of the product,
- financial transaction security is not yet sufficiently developed,
- the possibility of failed delivery,
- insufficient level of privacy of consumer preferences data,
- possibilities of seller presenting the false information,
- the problem of traditional shopping habits, etc.

At the international, global level, e-commerce is more complex than at the national level, so issues that need to be addressed, such as: taxation, differences in laws, differences in customs regulations and banking procedures, should be taken into account.

2.3 Internet commerce safety

One of the problems that needs to be solved when opening an online store is the way customers will be able to pay for ordered goods. This is a very important issue because the security of electronic transactions depends on it, which is a very common reason for canceling the purchase, i.e. different payment methods provide less or more security for both consumers and sellers. Today, with the development of information technology, new payment methods and e-commerce security systems are constantly developed.

Currently, credit cards are the most effective means of payment online. An internet user who owns a credit card can shop at one of the virtual stores without leaving the comfort of his armchair. Increasing the use of credit card payments imposes the need to prevent abuse by both consumers and sellers. Therefore, development of a system for

card verification and payment options authorization is necessary. This is possible due to the existence of IT equipment that enables quick connection with the card issuer. Many presentations today use the software that protects consumer data and entire transactions through public-key encryption. Public-key encryption is one of the most commonly used methods of data encryption today, primarily for the security and difficulty of decrypting this key. There are two keys, the public one, which is known to everyone, and the secret one, which is used to decrypt the data and is known only to those for whom the data is intended. However, errors are possible as with other security systems. There is another problem related to the Internet security. Even if they feel free to send their card number electronically to the seller, there is a risk of false online sellers. Behind an exceptionally well-designed online store that offers extremely affordable prices and conditions may be a group of people who want to abuse the features of the Internet as a global medium, or a group of teenagers who are entertained by it, as well as competitors of some businesses looking to inflict harm to competition in this way. Although the false sellers can be detected, there is still a possibility for them to deceive a number of consumers, who will then doubt regular e-shops or share their bad experience with potential consumers and thus deflect them from purchase. There are currently two possible approaches that can ensure the security of transactions. One is an extension of HTTP and is called SecureHTTP (SHTTP), but its implementation is minimal in practice because the market is now absolutely dominated by the so-called SSL (Secure Socket Layer) developed by Netscape. SSL has also been provided with client identity verification, which should elevate communication security under this protocol to an even higher level.

Consumers should check that the seller store server is secure (whether it supports SSL protocol) when shopping online. Any e-shop that offers anything for sale and does not have a secure server should be completely ignored, regardless of the affordability of the offer or possibly a great desire for a particular product. This is not just about insisting on secure communication, because the issue is basically relative, but about the fact that if a presentation claims to be commercial then it must show a certain level of professionalism and desire to protect its consumers

CONCLUSION

E-commerce is part of a global e-business strategy and aims to generate revenue through the World Wide Web, or the Internet, to improve customer and partner relationships to increase efficiency.

Online shopping, e-commerce, is becoming our daily routine. Instead of paper, pencils, stamps, we use the computers, with a growing number of business transactions being made much easier and faster. E-commerce allows for a wide range of improvements, faster finding of the most affordable seller of the desired product or service, located in any destination and performing the service in the optimum time period.

There are no physical or national boundaries in e-commerce, the restriction is only in the distribution of the computer network.

By means of electronic retail, by interaction, sellers are able to obtain more detailed information about the needs and desires of each buyer, and to automatically tailor their products to them. The result is a consumer-friendly product that can be compared to specialized sellers products or custom-made products, but at a price that applies in the mass market, which is very important.

The experience of business operation on the Internet so far shows that shopping using this way is as safe as any purchase, but you should still know that there are possible dangers.

As the research shows, the race between the men and the intelligent ones continues. At the same time, the end to the ongoing study of digital economics and commerce is not visible.

The robot or the cashier?

The final decision will be made by the men. This is logical given that e-commerce is created by the people for the people. Despite the many unknowns about what technological changes and Industry 4.0 bring us, one thing is already certain, robots and men are already colleagues

Last but not least, it should be emphasized we should not make "mythomania" out of e-commerce. It is a new way of doing commerce business, based on the application of modern information and communication technologies to face the new-digital-web-Internet economics. E-commerce, once referred to as a vision, today becomes a reality in countries with developed markets.

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SUMMARY

Due to the increased globalization of the market and economic regionalization, business can not be successful without the use of new information and communication technologies (ICT). The development of the Internet has led to a kind of reengineering in the method and efficiency of business systems. On the other hand, the Internet has become a platform for creating and realizing the marketing-management strategy of the business. There is a kind of electronic-digital-web

transformation of the traditional way of business to meet the challenges of Industry 4.0. In addition to other innovations, electronic-digital-virtual traffic channels are being developed, thus eliminating geographical and language barriers between participants in the chain of trade. Simple and fast communication is enabled, as well as almost instantaneous transmission of large amounts of data over long distances, a constant global availability of multimedia documents, digital delivery of goods and services, direct payment via the Internet, etc.

Defining e-commerce is not easy, because it's a rapidly-changing field. Electronic commerce should not be observed outside time and space. With the growth of information technology, the traditional forms of business in a sense of classical carriers of business activity are brought closer to informatics and electronics on the other side. The application of modern information technology and electronics provides many opportunities not only for trade, but for other activities too. Market-developed countries recognize IT as a resource to increase the competitive advantage of their companies. If we leave aside socio-economic, cultural, safety, ethical and legal aspects as the current topic, we can conclude that the way has been created for the transition of the economy led by resources into the digital economy. Thus, the trade switches from mechanical to the electronic phase of development.

Electronic commerce is part of a global e-business strategy and aims to generate revenues through the World Wide Web and Internet in order to improve relationships with clients and partners, all with goal to increase efficiency.

Shopping via the Internet, electronic store, becomes our everyday life. Instead of paper, pens, seals, computers enter the scene and enable a growing number of business transactions to be much easier and faster. E-commerce provides a wide range of enhancements, faster locating of the best bidder of the desired product or service, located at any destination and performing the service at optimum time.

In e-commerce there are no physical or national boundaries, the limitation is only in the extent of the computer network.

Through online retailing, by interaction, vendors are able to get more detailed information about the needs and desires of each customer, and automatically adjust their products to them. As a result, a consumer-friendly product appears, which can compete with the offers of specialized sellers or custom-made products, but at a price, most importantly, that is valid in the mass market.