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CONDITIONS OF THE DEVELOPMENT OF ELECTRONIC COMMERCE IN POLAND

UWARUNKOWANIA ROZWOJU HANDLU ELEKTRONICZNEGO W POLSCE

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Summary: The main aim of this article is to identify the contemporary determinants of the development of electronic commerce in Poland and state their influence on online businesses. In order to achieve this, descriptive statistics and statistical analysis, including comparative analysis, have been applied. On the basis of the examination, the contemporary growth factors (opportunities) in e-commerce such as m-commerce, Omnichannel commerce, Virtual Reality, and Augmented Reality can be characterised. The analysis also focuses on potential Internet-related threats and their impact on e-businesses.

Keywords: e-Commerce, ICT, Omnichannel commerce, Mobile commerce, Virtual Reality, Augmented Reality.

Streszczenie: Główne cele artykułu stanowiły identyfikacja współczesnych determinant rozwoju handlu elektronicznego w Polsce oraz określenie ich wpływu na działalność przedsiębiorstw prowadzących sprzedaż *online*. Do osiągnięcia tak sformułowanego celu wykorzystano metodę analizy opisowej i metodę analizy statystycznej, w tym porównawczej. Przeprowadzone badanie pozwoliło na scharakteryzowanie aktualnych czynników wzrostu (szans) w branży *e-commerce*, jak na przykład: *m-commerce*, *omnichannel commerce*, *virtual reality* i *augmented reality*, ale także potencjalnych zagrożeń związanych z obecnością w sieci Internet i ich skutków dla działalności e-przedsiębiorstw.

Słowa kluczowe: handel elektroniczny, ICT, handel wielokanałowy, handel mobilny, rzeczywistość wirtualna, rzeczywistość rozszerzona.

1. Introduction

Electronic commerce is often defined as a new way of running a business which involves selling and purchasing goods (services) over the Internet (Statistical Office of the EU [Eurostat], 2017, p. 176). It changes the way how enterprises operate internally

in the following crucial areas: communication as well as business and consumer relations (involving among others customers, suppliers, business partners), sales, order processing and payments, marketing, and delivery. All these processes used to take place directly through physical contact only, but nowadays they can also (or solely) be performed digitally. The key aspects of such business models are the implementation and use of modern telecommunication and computer technologies as well as the development of the information society (Krzysztofek & Szczepański, 2005, p. 170).

Changes occurring in present-day markets, including the digital transformation of commerce, enforce exact verification in the scope of the rudiments of modern business entities' functioning. The enterprises which aim at improving their competitive position must start using Information and Communication Technologies (ICT) to re-engineer their business processes (Davenport & Short, 1990). In order to develop and survive in the market, enterprises have to take up new challenges. They ought to be open to new ideas and to adopting unconventional approach. They have to constantly analyse the market and alter (adjust, improve) their methods of managing their businesses to, eventually, meet customer expectations and preferences. A contemporary consumer is an active and aware market participant who switches between the digital and the real world, which, on the one hand, gives a lot of opportunities, but on the other hand, adds to potential threats (e.g. in the field of personal data security).

The factors which make it possible for an enterprise to stay in the market and develop are constantly changing. Firstly, the basic determinants of the growth of the electronic commerce market were: the condition and access to the information and communications technology infrastructure, the cost of Internet access, the education index of a society, the overall Internet usage. Today, in addition to the aforementioned, there are other new determinants such as security, Omnichannel, Artificial Intelligence, Augmented Reality, online shopping, and mobile payments.

The objective of this article is the identification of the determinants of electronic commerce in the Polish economy and a description of their potential influence on the businesses aimed at trading in the digital market. In order to achieve this, the measures of descriptive statistics, on the grounds of the available research literature, and statistical analysis (including comparative analysis), all supported by data sourced from GUS, independent reports, as well as e-commerce-related market research have been applied.

2. The determinants of the development of electronic commerce in research literature

The issues regarding the conditions of the development of electronic commerce described in the source literature, publications, reports, and research results are not comprehensive. Additionally, as stated in the introduction, these conditions evolve with time – some aspects are in decline while others become more relevant.

However, for many years it has been observed that companies which do not have a proper infrastructure (hardware, software, Internet access, know-how) cannot compete in the electronic global market. The digital transformation in the business sector, once described as revolutionary, has become a standard. According to M. Norris and S. West, computer networks, software and computers have become the nervous system of the modern world (2001, p. 27). Lack of up-to-date technologies may be regarded in the future as one of the most common causes of company breakdowns.

A. Wawszczyk is one of the academics whose essays enumerate the determinants of the development of electronic commerce. He points to the factors which may increase a company's success in the global market as well as the factors which create a barrier for the future development. He lists the following (Wawszczyk, 2003, pp. 32-33):

1. The development of e-commerce stimulators:

- increased number of people with Internet access;
- low costs of Internet access;
- competition between Internet access providers;
- multilingual webpages;
- well-developed mobile phone market;
- increasing awareness of the existence of e-business;
- increasing trust and confidence in online shopping.

2. Barriers for the development of e-commerce:

- legal and tax restraints;
- lower persuasibility in relation to new technologies from other European countries;
- language barrier;
- the costs of networking.

Another academic who focuses on the development of e-commerce in Polish conditions is M. Niedźwiedziński. In his book entitled *Globalny handel elektroniczny*, in the context of the international trade turnover, he distinguishes intentional barriers (e.g. trade ban, transport restrictions) and barriers which are not top-down imposed such as: the stability of the monetary system, available banking services, insurance, transportation, secured payments, knowledge of foreign languages, business ethic, licences, customs tariffs, taxes (2004, pp. 94-102).

It is also important to mention G. Chodak's differentiation of the determinants, dividing them into several groups which are dependent on: economy (GDP *per capita*), law (legislation), politics (e-administration's development), demography (the percentage of young Internet users), and education (projects and training which enhance technical literacy and users' Internet skills; the percentage of students) (2006, pp. 139-147).

K. Bartczak in his monograph *Bariery rozwojowe handlu elektronicznego* analyses the factors stunting the development of e-businesses on the grounds of the

results from a survey carried out in 102 Polish companies. Amongst the most significant factors which have a negative influence on electronic commerce and its development, he distinguishes (Bartczak, 2016, pp.132-133):

- the digital divide;
- customers' allegiance to traditional trading and their anxiety about cyberthreats;
- fierce competition in the e-commerce market which involves the problem of vertical expansion and patent infringement;
- high expansion costs (market entry costs) and operational expenditure;
- insufficient financial and institutional support from the state;
- ambiguous rules of law;
- no proper security measures against cyberattacks and lack of procedures for processing and archiving personal data;
- the tools, applications, and systems that support online business used by a company in a very small and narrow way.

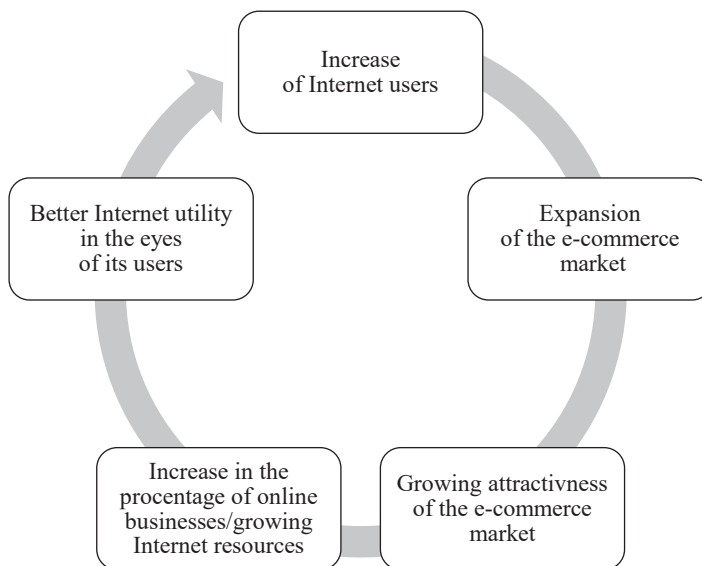


Fig. 1. Market-based interdependence of market growth factors in e-commerce

Source: own elaboration based on (Szapiro & Ciemniak, 1999, p. 71).

In the context of the electronic commerce market it is important to refer to a simple market-based interdependence described by T. Szapiro and R. Ciemniak. They present a significant number of Internet users and online transactions as the components of the market growth in electronic trade, as well as the interactions between the factors given in Figure 1. These factors have a direct impact on the e-commerce market but simultaneously depend on it (Szapiro & Ciemniak, 1999, p. 71).

3. The determinants of the development of electronic commerce in an economic activity

The decision to start electronic trading can be the first step towards a company's faster development, increased sales, and bigger profits. However, being online does not guarantee success. E-commerce is rapidly developing and changing, businesses are constantly trying to get a competitive advantage. In order to meet the demands of the market, they have to build their brand and loyal customers, provide high-quality products, be flexible, and act fast (Szapiro & Ciemiak, 1999). Thus, they should stay current with any changes in the e-commerce market as well as new technologies and forms of marketing, be innovative, provide security, keep track of the regulations and e-customers' preferences¹.

3.1. Omnichannel commerce

Nowadays the average customer expects secured transactions, comfort, and saving. This makes e-shops look for new inventions and ways of communication. In this case actions that are aimed at the integration of traditional and online selling with the mobile channel. Simultaneous and multi-channel selling may be a good solution to the problem of customers migrating from one channel to another as well as a response to the needs for innovative methods of payment and delivery which are interrelated with this process.

Omnichannel commerce is a new trend in the market, but in Poland it is becoming popular rather slowly. It should be understood as multi-channel selling which blurs the lines between offline and online shopping. According to the report by Izba Gospodarki Elektronicznej prepared by Mobile Institute, *Omni-commerce. Kupuję wygodnie* – 73% of Internet users shop for the products from the same category via more than one channel (Izba Gospodarki Elektronicznej, 2018). This shows that promoting one's business via multiple channels is crucial in order to meet customer expectations. Online and offline selling should intermingle and be complementary to one another.

3.2. M-Commerce/Virtual Reality (VR) and Augmented Reality (AR)

Mobile commerce (m-commerce) constitutes a part of electronic commerce and refers to using mobile devices in business processes. Mobile devices (such as smartphones or tablets) provide access to information, entertainment, and online shopping.

According to data obtained from *Omni-commerce. Kupuję wygodnie*, 98% of customers who use mobile devices such as smartphones or tablets perform various

¹ More information about e-customers' preferences can be found in (Pieczarka, 2017, pp. 87-94).

shopping-related activities (e.g. orders, offer comparison, payments). *E-commerce w Polsce 2019. Gemius dla e-Commerce Polska*, on the other hand, indicates that a smartphone itself is used for online shopping by 61% of consumers, especially the young ones – between 15 and 24 (Gemius & Izba Gospodarki Elektronicznej, 2019). Therefore, mobile devices are actively used for shopping and their constant upgrades and improvements give a better experience and engagement in the process of online purchasing to the consumers.

One of the latest new technologies (used mostly on mobile devices) which can revolutionise the online shopping market are virtual reality and augmented reality. Both technologies differ from each other in the degree of immersion. Augmented reality should be understood as “enriching” our real world with some virtual elements (the real world and computer-generated images combined) and virtual reality – as a complete “immersion” into the virtual world. These new inventions (already used by well-known brands in Poland such as BMW, L’Oréal, e-obuwie, Ikea, Coca-Cola, Tymbark, Volvo, Nike, Tommy Hilfiger, and Sephora) have already been changing many businesses. Augmented reality reduces the distance between product and customer, which usually occurs in e-commerce, and in that potential buyers can see the desired product from various angles and in different perspectives. It limits the risk of doubt or dissatisfaction before the final purchase. It is VR and AR which may play a vital role in the future of e-shopping.

3.3. ICT – Information and Communication Technologies

The Central Statistical Office (GUS) defines Information and Communication Technology (ICT) as technologies processing, accumulating, and sending information electronically (Główny Urząd Statystyczny [GUS], 2015). The key ICTs which influence the transformation of business processes in e-commerce are: owning a company website, being active in social media, Electronic Data Interchange (EDI), access to ERP (Enterprise Resource Planning) and CRM (Customer Relationship Management), a broadband Internet connection, Cloud Computing, Big Data etc. These technologies give us a better understanding of customer needs and, therefore, help to customise market offers as well as prepare for future changes in consumer preferences.

As presented in Table 1, the biggest increase in the use of ICT was observed in 2012-2015 which pertains to ERP and CRM. Both technologies are used for the management and optimisation of business processes. ERP systems are IT tools designed for planning and managing company resources while CRM deals with managing the information about the customers². These two systems are primarily built for big enterprises which process a significant amount of data about their

² More information about IT e-business systems can be found in (Misztal, 2018, pp. 152-158, 162-166).

commodities, customers, and finances. This thesis is also supported by GUS – in 2015 88% of big, 58% of medium-sized, and around 25% of small businesses used ERP and CRP.

Access to a broadband Internet connection and social media presence are becoming a standard in all Polish companies, no matter how big they are. Cloud Computing is mostly used by large enterprises (248%) and only by 5.6% of small firms. This also conforms with the changes (an increase) in the general interest in such services in 2012-2015. In big enterprises the increase was of 10.8%, in medium-sized – 4.9%, and in small 0.1%. Among the reasons for the rather scarce use of Cloud Computing technologies in Poland are the common presupposition that such services are expensive, the elaborate rules and regulations regarding the usage of Cloud Computing, and data security concerns. Additionally, it is worth noting that the Polish electronic commerce market is not fully fledged yet, thus many companies focus on developing their IT services independently.

Table 1. The use of selected information and communication technologies in businesses with access to a broadband Internet connection in 2012 and 2015 (%)

Specification	Small (10-49 employees)		Medium (50-249 employees)		Big (250 and more employees)	
	2012	2015	2012	2015	2012	2015
Purchase of Cloud Computing services	5.5	5.6	8.6	13.5	14	24.8
Access to a broadband Internet connection	79.7	91.5	94.6	98.4	99.5	99.4
Own website	61.3	61.4	85.2	84.2	91.9	91.4
Social media presence	92.3	91.5	98.9	98.4	99.8	99.4
Using ERP or CRM software	10.8	24.9	37.8	58	76.6	88

Source: own elaboration based on (GUS, 2013, 2016).

Using the information and communication technologies mentioned above is widely regarded as a competitive advantage in the modern world of business (Orzechowski, 2008, p. 59). This is because an e-company's efficiency depends on the performance of its information system. However, some of these services may be costly which can stunt the development of a company, a small one in particular.

3.4. Logistics systems

Logistics should be regarded as a fundamental part of e-commerce which is often crucial in the context of building a company's market position. Logistics can boost a business's development but also become one of the biggest impediments for sellers. Among the major problems of logistics in e-commerce are: supply management, production, distribution, and transit. These factors have a direct impact on customers' satisfaction for whom the most important aspect of online shopping is convenience.

A long wait for the ordered products is the cause of some customers' reluctance to shop online. This inconvenience has been partially solved by "Same Day Delivery". The Polish e-commerce leader in "Same Day Delivery" is: eobuwie.pl. Depending on the time a customer orders a product (the website presents available time slots), the delivery in Wrocław, Warszawa, Kraków, Katowice, Łódź, and Poznań takes place on the same day.

According to the *E-Commerce w Polsce 2019 report*, 55% of interviewees claim that low delivery costs make them shop online more often, while 31% of them are more inclined to do so if the delivery time is shorter. For 21% of customers "Same Day Delivery" is a case for online purchase (Gemius & Izba Gospodarki Elektronicznej, 2019). This means that, on the one hand, an average e-consumer aims at the reduction of delivery costs, but on the other, he or she is ready to pay more for delivery if it is faster or even on the same day. Therefore the variety of delivery options (and payments) is an important factor for the potential buyer and his or her online shopping decision-making.

The customers expect express and flexible delivery as well as a possible product return if they are not satisfied with their purchase. Lowering the costs and time of delivery cause constant pressure in transportation management (Schöder, Ding, & Campos, 2016). Thus the lack of proper solutions fit for the e-commerce logistics systems within the scope of the supply-chain management may generate high operational costs and negatively influence an e-business's market position.

Table 2. The barriers limiting or making electronic sales via website or a mobile application impossible in 2012 and 2015 (%)

Specification	Small (10-49 employees)		Medium (50-249 employees)		Big (250 and more employees)	
	2012	2015	2012	2015	2012	2015
Logistics issues (e.g. shipment)	28.8	28	31.2	29.2	27.4	27
Data security and ICT-related issues	18.4	19.8	18,8	19.7	15.3	17.2
Legal issues	15.2	15.4	15.7	15.2	15.8	16.7

Source: own elaboration based on (GUS, 2013, 2016).

As presented in Table 2, logistics-related issues mostly occur in small and medium-sized businesses. Nevertheless, in comparison to 2012, according to GUS the percentage of such companies experiencing such type of problems has been decreasing, regardless of the size of an enterprise.

3.5. Legal conditions/security

Equally important factors which influence e-commerce are legal conditions and secured transactions.

In accordance with the data presented in *E-commerce w Polsce 2019*, the percentage of Internet users concerned about payment security is decreasing. In 2016

it was 29% but in 2019 – only 17% (Gemius & Izba Gospodarki Elektronicznej, 2016, 2019). The reason for such a change could be the improvement in the consumer protection and rights introduced by the European Union and implemented into the Polish legal system in 2018 (the Act issued on 10 May 2018). The changed legal conditions apply to all businesses, regardless of their scope of operation, trade sector, or business model. Two of the most significant changes are the legal responsibility of an enterprise for personal data collection and processing as well as the much higher fines for the abuse of the new laws.

In terms of security, cybercrime prevention is another factor which matters in business. The lack of proper security measures against cyber-attacks may lead to many negative effects such as: fraudulent transaction³, losses due to operational stops, civil liability claims, recourse claims, legal costs, administrative fines, and penalty payments. The aforementioned circumstances may result in losing business reputation, trust, credibility, and, eventually, market position (Kędzior & Pieczarka, 2018, pp. 97-100). According to EY and Nethone's report *Bezpieczny handel w internecie* out of 150 researched enterprises as many as 71% do not use any technological solutions safeguarding them against obtaining their money by deception. The scale of the problem is not big in Poland (only 18% business entities affected) but with more noncash transactions being made, it is becoming more frequent, and 64% of the businesses whose 20% of payments are cashless have recorded cases of fraudulent transactions (Nethone & EY Polska, 2018).

As indicated by GUS (Table 2), it is bigger enterprises which are more concerned about legal issues. Small and medium businesses struggle mostly with personal data security and IT-related issues. The presented data shows that between 2012 and 2015 the percentage of enterprises dealing with data security and ICT-related problems increased. With the development of the e-commerce market, these issues escalate too. This refers to all enterprises, regardless of the number of employees. Therefore Polish e-commerce should not ignore the phenomenon of cyberattacks because they pose a serious threat to their very existence in cyberspace.

4. Conclusions

The Internet and new technological improvements boost e-commerce and online companies. The analysis of the factors influencing the income and sales of businesses in the electronic trade market is important and should be constantly performed. The scrutiny helps to predict upcoming developments such as new trends but also threats.

On the basis of the analysis it is possible to state the determinants of the development of electronic commerce and draw the following conclusions:

³ Fraudulent transaction (unauthorised transaction) – a transaction which has not been authorised by a card holder or a bank. Fraudulent transactions (and the attempts to conduct them) are usually performed with the use of stolen, lost (blocked), or counterfeit cards as well as cards registered with false names.

- Between 2012 and 2015 a general interest in ERP and CRM technologies could be observed in all three types of businesses in Poland, regardless of the number of employed people.
- Cloud Computing technologies are not so common in Poland but, nevertheless, their use increased fractionally between 2012 and 2015.
- A broadband Internet connection and social media presence have become a standard in all types of businesses, regardless of their size.
- The number of Internet users concerned about payment security is decreasing – while their confidence in online shopping may significantly stimulate the growth of the e-commerce market.
- Omnichannel commerce may improve sales and distribution in e-businesses;
- Internet users consider low delivery costs and fast delivery as an encouragement to shop online more often. Therefore various delivery options and good logistics are crucial.
- VR and AR technologies are becoming more common. The benefits are twofold: they reduce potential doubt or dissatisfaction of a customer before making the final purchase decision, and they bring a completely new potential e.g. in terms of marketing exercise.
- Between 2012 and 2015 the percentage of the problems related to ICT and data security increased, which means that these issues concern all types of businesses, regardless of the number of employees.

To recap, the development of e-commerce is determined by many factors. It is imperative to conform with the new reality in which the Internet and new technologies play a vital role. E-businesses need to be well-oriented and well-organised in order to adapt to the new circumstances as well as be innovative to meet customer expectations and demands.

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