
The Impact of the Electronic Commerce Market in the Supply Chain during COVID-19 Pandemic in Poland

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Abstract:

Purpose: The article presents issues related to the development of electronic commerce market caused by changes in the supply chain in the face of the COVID-19 pandemic.

Design/Methodology/Approach: The study used world-bank reports from statista portal.

Findings: The aim of the article is to present the impact of electronic commerce market in the supply chain. The functioning types of e-business and basic business models used in e-commerce are also presented. Payment methods used in internet sales in Poland are shown. An analysis of the online payment methods preferred by consumers during the COVID-19 pandemic was also performed.

Practical Implications: In the wake of the COVID-19 pandemic, retailers must develop increasingly efficient, faster, and more convenient delivery methods. For example, in the last year the number of users selecting same-day delivery in online search options has increased significantly.

Originality/value: The publication presents the results of research conducted on the basis statista international portal and central statistical office in Poland

Keywords: E-commerce, logistics chain, supply chain, value chain, ERP, globalisation, JIT.

JEL classification: C13, C22, C53, F31, G11.

Paper Type: Research article.

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1. Introduction

The current pandemic has caused a sharp increase in online sales. The risk of contagion current pandemic has caused a sharp increase in electronic commerce. The risk of infection and numerous limitations mean that many companies have moved their activities to the Internet. Coronavirus (COVID-19) continues to spread, affecting more and more public health, as well as many other industries and sectors. From travel and tourism to finance and construction, the global pandemic has affected almost every aspect of the economy. One of the industries that has seen particularly noticeable changes over the past few months is e-commerce. With most countries issuing stay-at-home warrants to slow the spread of the disease, many are now isolating themselves, turning to technology for work, education, communication, and shopping. In the past, epidemics and natural disasters have also disrupted supplies, but this has only happened to a lesser extent than the COVID-19 pandemic. The epidemics so far have hit primarily the supply chains of individual industries.

The economic impact of the current pandemic will be greater due to the growing number of international ties in the global economy. It is necessary to develop new solutions, in the field of e-commerce. The e-commerce segment is both an important sales channel and a development opportunity for B2C and B2B companies, forcing them to change their overall sales and distribution strategies. With increasing popularity, new supply chain challenges emerge that need to be resolved quickly so that businesses can take advantage of the opportunities e-commerce opens for them. The pressure to adopt and improve an e-commerce strategy creates both difficulties and opportunities for companies that have incorporated e-commerce into their overall omnichannel selling strategy.

2. Electronic Commerce Market Development

With information and communication technology, doing business internationally has totally changed. The progressive digitalization of trade ensures rapid communication between trading partners or between the customer and the organization etc. Organizations today want to have a competitive advantage over their competencies, constantly considering expanding their business to reach different customers in different locations. This is not possible with a normal distribution channel, point of sale, etc. To do this, they use the internet, which can be accessed from anywhere in the world, and modern supply chain management helps them deliver products to customers wherever they want at an affordable price.

The electronic commerce market is currently the most dynamically developing branch of commerce. The term e-business (e-business) has been here again first used in 1995 by IBM (International Business Machines Corporation). According to one of the simplest definitions proposed by S. Pangsy-Kania, e-business is a type of business that is run with the use of ICT solutions, including primarily web

applications, as well as automatic delivery or exchange of information and business data (Pangsy-Kania, 2012).

According to authors such as A. Hartman, J. Sifonis and J. Kadora, electronic business refers to all projects implemented via the Internet, mainly tactical and strategic, which transform business relationships, such as business-to-consumer (business - clients), business-to-business (business - business) or intra-business (business connections). These authors added that e-business is a new source of efficiency, speed, innovation of enterprises and the functioning of new ways to create value in the organization (Hartman, Sifonis, and Kador, 2001). The OECD definition indicates that this trade is a business run through the network in the WTO definition that it covers various means of production or marketing, and in the WCO definition that it supports data traffic between computer systems of different enterprises.

Among the events immediately preceding the emergence of e-commerce were the lifting in 1991 of the commercial restrictions imposed by NSFNET (National Science Foundation NET) regarding the use of the Internet by individual users and then the creation, with the participation of IBM, Merit Network Inc., and MCI Communication Corp., infrastructure, thanks which made it possible to make commercial internet connections. The creation in 1993 one of the first web browsers - Mosaic, thanks to which virtually anyone could navigate around network and use its resources. The finalizing of the 1995 contract for the sale of ANS to America Online, thanks to which all Internet infrastructure remains so far only at the disposal of the public sector, passed to the private sector and it was he who began to play the most important role in the further development of the Internet. The commencing of commercial operations on the Internet in 1995 with companies such as Amazon (the world's largest online store that offers books, music and movies), Dell (producer computer equipment) or eBay (portal with online auctions), which caused mass development of e-commerce and gradual dissemination of its individual forms and models among more companies (Tian and Stewart 2006; Thalassinos and Thalassinos, 2018).

From the mid-1960s until today, internet trends and e-commerce continue to evolve. E-commerce sales around the world are constantly growing. In 2018, it reached \$ 2,842 billion. This is more than twice as much as in 2014. Statista estimates that until 2021, sales will continue to grow significantly and within 3 years it may reach almost twice as much, i.e. as much as USD 4,878 billion.

3. International Electronic Commerce

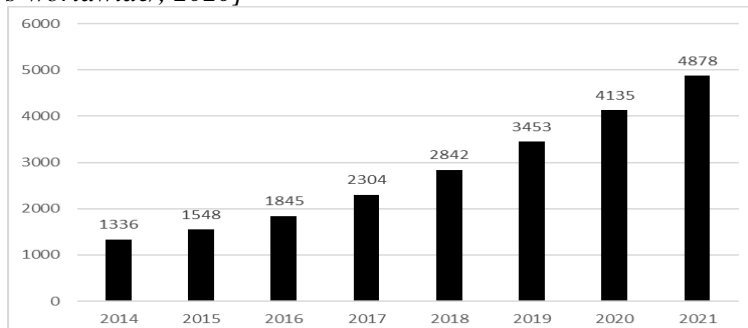
It involves entering into commercial transactions and selling products through various means and devices electronic, such as the Internet, telephone or fax, for example currently the most popular. International e-commerce consists of three basic ones entities: consumers, enterprises and administration. Due to the nature of

the relationship between these entities, several types of e-business have developed. The basic relationships between e-commerce entities include (Combe, 2006):

- C2C (customer-to-customer) - refers to transactions between consumers that are carried out, for example, as part of the operation of auction sites,
- C2B (customer-to-business) - includes transactions between consumers and enterprises, with consumers as their initiators, and the goal is, for example, price comparison,
- C2G (customer-to-government) - these are transactions between citizens and public administration that concern, for example, taxes,
- B2B (business to business) - this is "classic" e-business and includes implementation of business processes between two enterprises,
- B2C (business-to-consumer or business-to-client) - this is "classic" e-commerce and includes transactions between businesses and consumers,
- B2G (business-to-government) - covers transactions between enterprises and public administration, such as public procurement or tenders,
- G2C (government-to-citizen) - concerns the flow of administrative information from offices to citizens,
- G2B (government-to-business) - covers the flow of economic information (customs documents, statistical data) from offices to companies
- G2G (government-to-government) - cooperation between organs public administration, which coordinates internal processes.

Recent years have brought a sharp increase in e-commerce sales as shown in the figure below.

Figure 1. Sales of electronic commerce market worldwide from 2014 to 2021 (in billion U.S. dollars) [source: own based on <https://www.statista.com/statistics/508988/preferred-payment-methods-of-online-shoppers-worldwide/>, 2020]



Source: Own study.

As shown in the chart over the years, a significant increase in the importance of sales in the global approach to the e-commerce industry.

E-commerce is one component of the digital economy. Covers goods and services sold and purchased online, including transactions through platform-based businesses such as ride-inducing apps, reflected in business-to-consumer (B2C) revenue. UNCTAD estimates that the global value of e-commerce reached \$ 29 trillion in 2017.

4. The Importance of the Electronic Commerce Market in Supply Chains

An efficient supply chain is now becoming a key driver for growth, both for retailers and manufacturers. Due to the development of electronic commerce market, growing consumer expectations and technological progress, companies must try very hard to meet modern challenges in the field of supply chain organization. The coronavirus (COVID-19) continues to sweep across, it is taking an ever-increasing toll on public health, as well as numerous other industries and sectors. From travel and tourism to finance and construction – almost every aspect economy has been affected by the global pandemic.

One industry that has seen particularly noticeable changes over the past few months is e-commerce. As most countries have issued stay-at-home orders to slow the spread of the disease, many people are now self-isolating while turning to technology for work, education, communication, and shopping. Retailers and manufacturers need to significantly improve the performance of the supply chain while managing the costs of this process well. E-commerce is growing rapidly - in 2013, e.g. 9% of sales were made through this channel, global retail sales, in 2023 it will be 29 percent. With the development of online e-commerce, new delivery models appear, retailers are forced to actively participate in delivering products to customers.

In the next five years, e-commerce will grow four times faster than stationary, but physical stores will remain an important place of contact between retailers and customers. In the supply chain of the future, physical locations will play an important role, increasing efficiency and seamlessly integrating online and offline channels. Companies need to expand their supply chain capabilities because customers expect that they can get their product "how they want, where they want, when they want" according to well-known JIT- just in time rule. For the supply chain organizer, the cost of maintaining different delivery methods is a major challenge. Each logistics model has its own economy, which is determined by the costs of labor, transportation, real estate, equipment, and warehouse inventory.

5. Supply Chains in the Face of a Pandemic

Uninterrupted continuity of supply chains is one of the main elements of the economy of any well-functioning country. Supply disruptions can affect all participants in economic exchange - from end consumers to companies and corporations, to the proper functioning of states. The impact of the COVID-19

pandemic on the global economy is not yet fully assessed. In the first phase of the pandemic that appeared in Europe in March 2020. We saw a sudden increase in demand for FMCG goods, cleaning agents and pharmaceuticals. After the increased activity, it was time to stabilize, and then to drop to the standard demand for these goods. It has become very important to organize additional storage space, increase the number of shifts and involve additional personnel, as well as efficiently manage the fleet. Until today, many companies from these industries have secured access to buffer warehouses with us in the event of the second or third wave of the pandemic.

Progressive automation and digitization contributed to more efficient warehouse management, automatic supervision over stored and transported goods improved the control of warehouse processes and order management, and digitization enabled remote work. The pandemic also verified the rightness of activities aimed at diversifying sales channels, the development of e-commerce, a trend that had developed much earlier, significantly accelerated. Despite the reopening of stores, the increased interest in e-commerce remained.

According to the UNCTAD's report from April 2020 E-commerce sales hit \$ 25.6 trillion globally in 2018, up 8% from 2017, according to the latest available estimates released today by the UN's trade and development body. The value of global B2B e-commerce in 2018 was \$21 trillion, representing 83% of all e-commerce, comprising both sales on online market platforms and electronic data interchange transactions. B2C e-commerce was valued at \$4.4 trillion, up by 16% from 2017. Cross-border B2C e-commerce sales amounted to \$404 billion in 2018, representing an increase of 7% over 2017. The United States continued to dominate the overall e-commerce market (Table 1). It remained among the top three countries by B2C e-commerce sales, alongside China and the United Kingdom.

Table 1. *E-commerce sales: Top ten economies*

Rank	Economy	Total e-commerce sales in US dol. billion
1	USA	8.640
2	Japan	3.280
3	China	2.304
4	Korea	1.364
5	UK	918

Source: *Own based on <https://unctad.org/press-material/global-e-commerce-hits-256-trillion-latest-unctad-estimates>, UNCTAD, at the start of its UNCTAD eWeek event.*

6. Payment Methods in Electronic Commerce in Poland

Cash payments are a form of payment that is mainly intended for people who want to pay for online purchases but do not have a bank account or payment card. There are several ways to make a cash payment for a good or service purchased online, we can include:

- payment on delivery, which consists in the fact that we pay for the ordered goods or service to the delivery agent upon delivery. Then our payment is transferred, electronically, to the account or, optionally, to the indicated address, by postal order. Although this type of payment was until recently the most popular payment method (especially in Poland), it is usually unprofitable, as it involves high fees, after adding which it may turn out that it would be more profitable to buy goods in a stationary store;
- postal order, i.e. payment made at any post office, using a postal form, then sent to the recipient's address;
- a bank transfer carried out at a bank branch, which adds a commission for the transfer that was made in the bank window. The amount of commission depends on the type of account and the bank from which the transfer is made;
- VIA - Moje Rachunki is a cash payment option at one of the approx. 7000 retail outlets in Poland, such as Carrefour, Kaufland, or PKN Orlen and Bliska gas stations;
- Small Bills is an option implemented in "Żabka" stores, it consists of paying bills whose total amount does not exceed PLN 500. A fee of around PLN 2 is added to the fees;
- UKASH vouchers are an international method of payment using vouchers previously purchased in cash, e.g. at a kiosk or gas station. In this case, the payer first purchases coupons of the selected value, and then redeems them in the store by entering the 19-digit coupon number at the time of purchase.

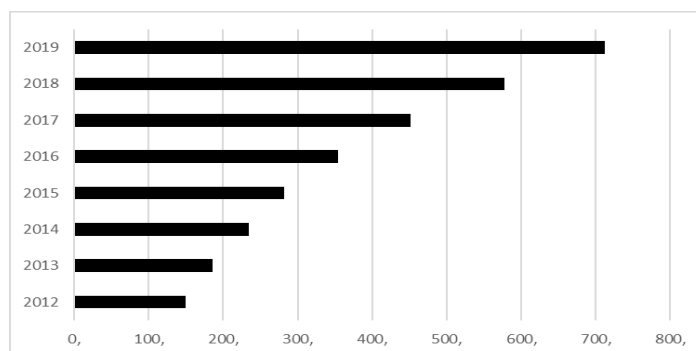
Online bank transfers are not much different from traditional transfers, implemented in the bank window. The main difference is only the customers registered in online banking, carry out all the activities themselves in the case of traditional transfers, they would be made with the help of a bank employee using the Internet network. A bank transfer guarantees customers security use funds because each transaction requires authentication (e.g. via SMS code) and approval by the account holder before making a purchase. Unfortunately, due to the fact that there is a payment method "in advance", i.e. before receiving the ordered goods or services, he still raises the fear that the product will not be delivered or the seller will delay sending it. It is important, therefore, to approach this form of payment wisely and use it in a situation where we can be sure that the person who receives our money is trustworthy.

Some time ago, to make such a transfer, the customer had to log in to his account and knowing the company account number, usually given on the website of the online store, fill in the recipient's details himself, as well as the amount he intends to send. The intermediary systems for transaction processing have come with ease. The customer, using the payment system, is redirected to the automatically completed payment form, he does not have to worry so that he will make a mistake when completing the number accounts and the money goes to the wrong recipient. Using

payment systems requires the seller to have an individual account. There are many websites dealing with this type of activity, the most popular are:

- Przelewy24, which is owned by the Poznań company Dial-Com24, is also the owner of the Tickets24.pl portal. The Przelewy24 system was established in 2004. Since then, its popularity began to grow rapidly, and more and more internet sellers decided to use its services.
- PayU is a system belonging to the company with the same name, which is part of the Allegro Group.
- What distinguishes this system from many others operating on this market is the fact that it is not intended to support e-businesses and online stores, but to handle individual transactions carried out by private individuals on the Internet.
- The biggest advantage of the website is that you can make transactions without having an online bank account.
- PayPal, which is a definite pioneer of this type of payment. Especially in the US market it plays a very important role, having hundreds of millions of customers. Its advantage is that its activity is not limited only to the internet.
- DotPay is a website founded in 2000, belonging to the company DotPay S.A. It is a European company, and the portal is available in nine different languages.

Figure 2. PayPal's annual payment volume from 2012 to 2019 (in billion U.S. dollars)



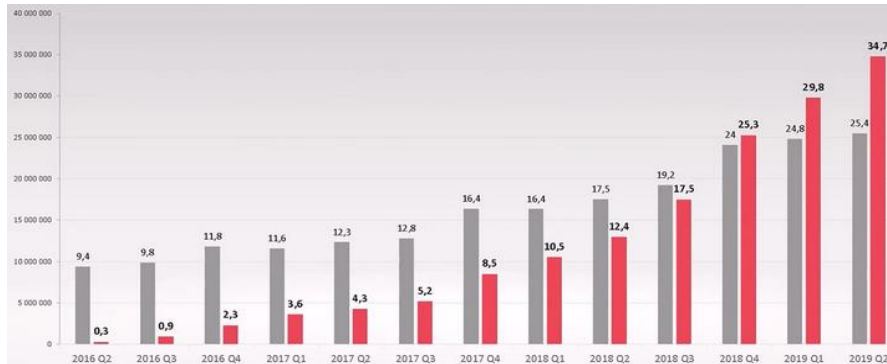
Source: Own based on <https://www.statista.com/statistics/508988/preferred-payment-methods-of-online-shoppers-worldwide/>, 2020].

6.1 BLIK

The Polish PSP payment standard says that in March 2020 BLIK users' activity increased the most in online stores selling electronics and household appliances. "In this category, the increase compared to February is as much as 270 percent. Second place were household chemistry stores, where the increase in the number of transactions month to month is 216 percent. The third most-chosen category turned out to be online bookstores with an increase in the number of transactions by 85

percent. Every user and customer of online stores pays attention to the payment options for purchases. They must not only be safe, but also comfortable, without any additional steps required when placing the order.

Figure 3. Comparison of usage cards versus BLIK in polish on-line shopping payments



Note: red-BLIK, grey- CARDS

Source: <https://blog.home.pl/2020/04/blik-szybkie-platnosci/>

7. Consumer Purchasing Patterns under COVID-19 Pandemic and Electronic Commerce

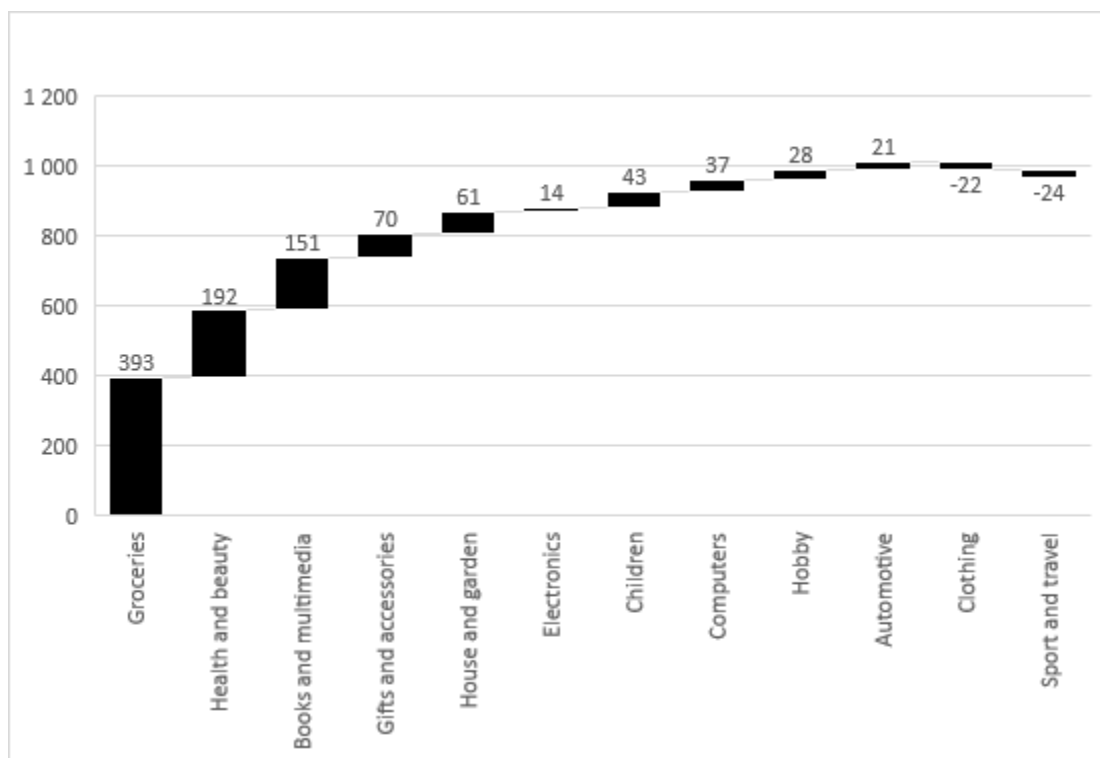
COVID-19 contributes to growth of e-commerce. The global coronavirus pandemic is affecting consumer behavior worldwide. In the week ending April 26, online traffic in the supermarket segment increased by 135 percent compared to the reference period in January and February 2020. In general, e-commerce sales have increased in recent years, a trend that was expected to continue through 2024. It is likely that this sector will see further increases due to COVID-19, as many people choose to stay at home and amend their daily routines to avoid catching the airborne virus. As people spend longer stretches at home, consumers are purchasing more nonperishable food-items, cleaning supplies, and home entertainment products. This is often done through online marketplaces, such as Walmart or Amazon. In contrast, there has been a decrease in spending in clothing and furniture stores, as most of these locations have been temporarily shut down to help contain the spread of coronavirus.

8. Summary and Concluding Comments

This article analyzes the impact of the development of e-commerce on the supply chains in the time of the COVID 19 pandemic. The functioning types of e-business and basic business models used in e-commerce are also presented. The methods of payment used in online sales are characterized. The research methods used were the descriptive method of the phenomenon, the comparative method of literature on the subject and internet sources, and the method of statistical data analysis. Polish and

English-language literature and internet sources were analyzed, as well as statistical data from international reports on the e-commerce industry and supply chains.

Figure 4. Growth in transactions number and sales value of orders in online stores due to the coronavirus (COVID-19) outbreak in Poland from February to April 2020, by category



Source: Own based on <https://www.statista.com/statistics/508988/preferred-payment-methods-of-online-shoppers-worldwide/>.

The e-commerce market will undoubtedly continue to grow, resulting in an increasing number of enterprises that are highly likely to decide to start operations under it. The growing share of e-commerce in total commerce will increase the belief of potential customers that online shopping is easy and secure. And as more and more people acquire confidence to buy online, the value of the average shopping basket will increase. It will be a slow but systematic process. The consumer will be increasingly interested in more expensive products, gaining the courage to buy them, the e-commerce market will undoubtedly continue to grow, causing that an increasing number of companies are likely to start operating under it. The e-commerce sector is constantly developing, and companies are still facing their growing expectations when fulfilling the client's order. Thus, enterprises must meet many criteria related to supply chain management to optimally fulfill the order of the final recipient. The priority of every well-managed company is to introduce

solutions based on the principle of continuous improvement of the company's operations and work organization.

Today, e-commerce is one of the main drivers of supply chains. The importance of internet trading will continue to grow. One of the sources of creative solutions will be, among others "Big data", i.e. a huge set of data, the analysis of which will allow you to optimize delivery processes and introduce changes that are to bring benefits to the company.

The first noticeable effect in Europe of the emerging COVID-19 pandemic was the disruption of supply chains from China. The pandemic stopped the flow of global supply chains. Many industries and countries have suffered from this. Resumption of production capacity is ongoing - it has become necessary to develop new solutions. In the future, global corporations are likely to take more account of the security of supply chains and e-commerce.

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