

The Digital Transformation of the EU Market

The Digital Single Market Strategy in the Context of E-Commerce Development Diversification in Czechia, Poland and Slovakia

Jan W. Wiktor

Prof. dr hab., College of Management and Quality Sciences, Cracow University of Economics, Poland
<https://orcid.org/0000-0001-6353-7620>

Jaroslav Ďaďo

PhD, Prof. Ing., Faculty of Economics, Matej Bel University, Slovak Republic
<https://orcid.org/0000-0001-9396-8499>

Iveta Šimberová

PhD, Doc. PhDr., Faculty of Business and Management, Brno University of Technology, Czech Republic
<https://orcid.org/0000-0002-9236-4439>

Submitted: 13.03.2020 | Accepted: 20.10.2020

Abstract

Purpose: The paper aims to assess differences and similarities between e-commerce development in Czechia, Poland and Slovakia in the context of the EU's Digital Single Market strategy. The theoretical framework of the paper is based on synthetic considerations related to the digital transformation and development of the EU digital economy. The DSM strategy identifies the barriers to e-commerce market development in the European space and sets directions for legal changes, creating favorable conditions for building a strong e-economy including e-commerce and a modern digital society in all EU member states.

Design/methodology/approach: The empirical part of the paper presents differences in e-commerce development in three countries: Czechia, Poland and Slovakia. The research was based on the analysis of the literature and secondary sources. The former allowed for the identification of the consequences

Correspondence address: College of Management and Quality Sciences, Cracow University of Economics, Rakowicka 27, 31-510 Cracow, Poland; Faculty of Economics, Matej Bel University, Tajovského 10, 975 90 Banská Bystrica, Slovak Republic; Faculty of Business and Management, Brno University of Technology, Kolejní 2906/4, 612 00 Brno, Czech Republic; e-mails: jan.wiktor@uek.krakow.pl; jaroslav.dado@umb.sk; simberova@fbm.vutbr.cz.

Suggested Citation: Wiktor, J.W., Ďaďo, J., & Šimberová, I. (2021). The Digital Transformation of the EU Market. The Digital Single Market Strategy in the Context of E-Commerce Development Diversification in Czechia, Poland and Slovakia. *Problemy Zarządzania (Management Issues)*, 19(1), 12–29. <https://doi.org/10.7172/1644-9584.91.1>.

of the DSM strategy for the development of e-commerce in the EU member states, the latter allowed for a comparative assessment of e-commerce development in the three surveyed countries. The adopted research method allowed for the assessment of the size, structure and dynamics of the development of the e-commerce market in the three countries covered by the research.

Findings: The presented analysis describes the status, conditions and development trends in e-commerce in Czechia, Poland and Slovakia. The three analyzed countries are – to a large degree – uniform in terms of cultural, historical and economic aspects. The development of e-commerce in these countries is similar, but it is also characterized by considerable differences. The similarities refer to the level of informatization, the socioeconomic characteristics of users and e-consumers, development projections until 2023, and the social acceptance of online shopping. Simultaneously, the analyzed countries have diversified industry structures of online markets, they differ in the values of ARPU indices and record considerably lower values of online shopping per capita as compared with average EU standards. Limitations in developing transborder trade are due to similar factors as in other EU member states.

Research limitations/implications: The article, by its nature, has its limitations. They result from the concentration of considerations on the formal side of DSM – assessment of the DSM project architecture, its priorities and identification of opportunities and conditions of its implementation in each member country. The problem of diversifying e-commerce development in three countries is general and limited in the space of analysis. The limitations apply to the use of one research method, which is nonetheless important and adequate to the problem. When designing future research, we indicate the need to use methodological triangulation. An important and interesting direction of future research will be detailed studies of e-consumers, e-commerce strategies of enterprises and the extension of research to other countries, to the international environment.

Originality/value: The presented comparative analysis is significant from the perspective of its cognitive value. It combines an approach of management sciences with the macro- and microeconomic perspective. The former represents a platform of corporate functioning and its development in the environment of networks, new business models and new consumer characteristics, behaviors and assessments of companies' marketing offerings. The other perspective is expressed by a new macro- and microeconomic environment, the character of regulation, transborder online competitive mechanisms, continuous processes of digital transformation and e-economy development. The results of the research can lead to further research of corporate management and transborder strategies in the environment of the digital transformation and creation of the digital single market across Europe.

Keywords: digital single market, EU, e-commerce, Czechia, Poland, Slovakia.

JEL: M21, F14, F23

Transformacja cyfrowa rynku Unii Europejskiej. Strategia jednolitego rynku cyfrowego a dywersyfikacja rozwoju e-commerce w Czechach, Polsce i Słowacji

Streszczenie

Cel: ocena podobieństwa i zróżnicowania rozwoju e-commerce w Czechach, Polsce i Słowacji w kontekście strategii Jednolitego Rynku Cyfrowego UE. Ramy teoretyczne artykułu tworzy syntetyczna refleksja dotycząca transformacji cyfrowej i rozwoju gospodarki cyfrowej UE. Strategia JRC, identyfikując bariery rozwoju rynku cyfrowego w przestrzeni europejskiej, formuluje określone kierunki zmian prawnych, tworzących korzystne warunki do budowy silnej gospodarki elektronicznej, w tym e-commerce i nowoczesnego społeczeństwa cyfrowego w każdym kraju członkowskim UE.

Metodologia: część empiryczna artykułu ukazuje dywersyfikację rozwoju e-commerce w trzech krajach: Czechach, Polsce i Słowacji. Badania oparto na analizie literatury i źródłach wtórnych. Ta pierwsza

pozwołała na identyfikację konsekwencji strategii DSM dla rozwoju e-commerce w krajach członkowskich UE, druga – umożliwiła ocenę komparatywną rozwoju e-commerce w trzech badanych krajach. Przyjęta metoda badań pozwoliła na ocenę wielkości, struktury i dynamiki rozwoju rynku handlu elektronicznego w trzech krajach objętych badaniami.

Wyniki: przedstawione wyniki opisują stan, uwarunkowania i kierunki rozwoju handlu elektronicznego w Czechach, Polsce i na Słowacji. Trzy analizowane kraje są w dużym stopniu jednolite pod względem kulturowym, historycznym i ekonomicznym. Rozwój handlu elektronicznego w tych krajach jest podobny, ale charakteryzuje się też dużymi różnicami. Podobieństwa dotyczą poziomu informatyzacji, cech społeczno-ekonomicznych użytkowników i e-konsumentów, prognoz rozwoju do 2023 r. oraz społecznej akceptacji zakupów online. Jednocześnie analizowane kraje mają zróżnicowane struktury branżowe rynków online, różnią się wartościami wskaźników ARPU oraz notują znacznie niższe wartości zakupów online per capita w porównaniu ze średnimi standardami unijnymi. Ograniczenia w rozwoju handlu transgranicznego wynikają z podobnych czynników, jak w innych państwach członkowskich UE.

Ograniczenia/implikacje badawcze: artykuł ze swej natury ma swoje ograniczenia. Wynikają one z koncentracji rozważań na formalnej stronie DSM – ocenie architektury projektu DSM, jego priorytetów oraz identyfikacji szans i warunków jego realizacji w każdym kraju członkowskim UE. Problem dywersyfikacji rozwoju handlu elektronicznego w trzech krajach jest ograniczony przestrzennie. Ograniczenia dotyczą stosowania jednej metody badawczej, choć istotnej i adekwatnej do problemu. Projektując przyszłe badania, wskazujemy na potrzebę zastosowania triangulacji metodologicznej. Ważnym i interesującym kierunkiem przyszłych badań będą szczegółowe badania e-konsumentów, strategię e-commerce przedsiębiorstw oraz rozszerzenie badań na inne kraje, otoczenie międzynarodowe.

Oryginalność/wartość: zaprezentowana w artykule analiza komparatywna ma istotne znaczenie poznawcze. Łączy spojrzenie nauk o zarządzaniu z perspektywą makro- i mikroekonomii. To pierwsze to płaszczyzna strategii funkcjonowania przedsiębiorstwa i jego rozwoju w środowisku sieci, nowych modeli biznesu i nowej charakterystyki konsumenta, jego zachowań rynkowych i wartościowania oferty marketingowej przedsiębiorstw. Druga z kolei jest wyrażona przez nowy kształt makro- i mikrootoczenia, charakter sfery regulacji, mechanizmy konkurencji w sieci, ponad granicami, nieustanne procesy transformacji cyfrowej i rozwój e-gospodarki. Wyniki analizy tworzą przesłanki do podejmowania badań problemów zarządzania i transgranicznych strategii przedsiębiorstw w warunkach transformacji cyfrowej i budowy jednolitego rynku cyfrowego w przestrzeni europejskiej.

Słowa kluczowe: jednolity rynek cyfrowy, UE, e-commerce, Czechy, Polska, Słowacja.

1. Introduction

The paper aims to assess the digital transformation of the European Union Market in the context of e-commerce development in Czechia, Poland and Slovakia. The presented considerations are based on three groups of issues which constitute a set of logical interdependences:

- reasons for, character and effects of the digital transformation – a peculiar *signum temporis* of the contemporary world. Considerations in this area provide a background for the theoretical framework of the issue identified in the title of the paper. They represent a kind of a double helix which, in a synthetic form, expresses two paradigms: technological revolution and network society, or, in other words, digital economy and digital society development,

- assessment of the strategic programme for the convergence of the EU digital market – building the Digital Single Market (DSM). The analysis focuses on its characteristics, structures and significance for the EU as a whole and its particular member states in the context of creating appropriate conditions to face increasing global competition on the digital market. This general platform of considerations is referred to an analysis of specific cases at company and consumer levels within the e-economy,
- identification of the specific issues related to the EU DSM in the context of diversified e-commerce development levels in three countries: Czechia, Poland and Slovakia. E-commerce is an area which, in a way, binds the e-economy – it comprises various issues related to IT and its development and the supply of digital services on the one hand, and, on the other hand, demand for digital products and services, new attitudes and behaviors among e-consumers, and issues related to market participants' network coordination. The choice of the analyzed countries is the effect of a number of similarities with regard to social, cultural and economic characteristics as well as similar processes of transforming their centrally planned economies into a free market economy. In the 2019 DESI ranking, which reflects the development of digital economies and societies, all the three countries are below the EU's average (52.5 points): Czechia takes number 17 spot (50.0), Slovakia ranks 20th (46.3), and Poland's number is 25 (41.6) (European Council, 2019c)¹. This issue is undertaken by an international team, which is the effect of the long-lasting cooperation of the authors.

2. The Digital Transformation – Its Conditions and Challenges

A major role in creating the image of and transforming the contemporary world – the world of business and social life – is played by technological changes in the area of collecting, processing and disseminating information. These changes are considered from the perspective of their causes as well as consequences in IT, technical and technological fields, as well as from the point of view of social, application and user related issues. They occur in a complex environment and their mid- and long-term implications are not explicitly identified (Harari, 2018). A broad description of the mechanism of these changes is neither possible nor necessary. On the other hand, it is necessary, for the purpose of this paper, to present some considerations with regard to the causes and challenges of the revolution in the area of information techniques and engineering, and information and communication technologies.

The digital transformation expresses a coherent combination of radical changes (“radical destruction” – Zacher, 2013) in technical and technological

methods and value creation, accompanied by equally significant social changes (Baker, 2014; Reddy & Reinartz, 2017; Skinner, 2018).

The first area of the transformation relates to production and technical aspects and involves the replacement of mechanical and analogue technologies with digital systems. The “*fourth industrial revolution*” (Schwab, 2016) and “*the fourth digital revolution*” – “*The Fourth Revolution of Humanity*” (Skinner, 2018) mark a shift from an industry-based economy to a new type of an economy – e-economy, digital economy, and knowledge-based economy. The second area of the transformation comprises breakthrough social changes – on the one hand, they result from changes in the first area, and on the other hand, they constitute their background and a platform for anticipation and acceptance. The process of these changes marks a transformation of the industrial and post-industrial society into the information society (Topfler, 1980; Webster, 2014; Westerman, Bonnet, & McAfee, 2014). The integration of the two areas (which can be metaphorically described as a *double helix* – the intertwining around a common axis) is unprecedented in the history of developing and transforming manufacturing processes (the subsequent industrial and post-industrial revolutions and the process of servitization) and the dissemination of other, earlier than computer-based media on a global scale (Rothbard, 2005; Castells, 2009; Caudron & Van Peteghem, 2014; Anderson et al., 2018).

The digital transformation has its own rules with regard to technologies, all economic sectors, companies and humans, or, in a broad sense, the entire social system (“*Digital Human*” – Skinner, 2018). The foundations and character of these processes are rightly referred to by M. Castells as two paradigms of transforming the contemporary world: the paradigm of information technology and the paradigm of the network society (Castells, 2009, pp. 74–79). We accept these paradigms in the context of the problem identified in the title of this paper. Both paradigms are interlinked – similarly to the relationship between technological and social changes. Their major components are the following assumptions:

- information is a “binder” (or, as Castells calls it, “raw material” of a paradigm) which binds all participants and all areas of economic and social life,
- the impact of new technologies and the new medium – the internet is ubiquitous,
- social and economic systems are characterized by “network logic”. This logic expresses the existing and increasing complexity of business and social relations as well as interactions in all processes and organizations (Castells, 2009, p. 80).

The combination of the two paradigms expresses the significance of information for contemporary humans, social and economic systems in all their dimensions (micro- and macroeconomic aspects)², the role of information and knowledge as such, access to information, and the

possibilities and consequences of presence in the global web (www). The internet is a master and accelerator of socioeconomic development. The network of information and relationships is ubiquitous – it acts as a *signum temporis* of the contemporary world and determines the identity of societies – information societies and an economy dominated by information and communication technologies. The technological transformation and the convergence of IT systems leads to increasing interdependences among various components, tools and procedures on a global scale. The logic of networks based on digital nodes and connections which increase innovativeness and employ 5G technologies, data based economies, IoT, cloud computing, big data, mobile social media, and AI represents the logic which dominates the contemporary world. As Kelly rightly stated, “*understanding how networks work will be the key to understanding how the economy works*” (Kelly, 1998, p. 2).

The digital transformation visibly changes the image, character and mechanisms of the functioning of an economy, markets, industries, companies, the public sector and the third sector (NGOs). The process of breakthrough qualitative changes is universal, global and irreversible, but the pace of digital transformations – the development of the digital economy and digital society described by DESI and IDESI – varies considerably in particular countries, economies, markets, industries, social groups, etc. Technological sectors versus other sectors, generation Y in social media, and the digital aspects of social exclusion – all these factors affect the pace of the above changes.

The scale and causes of diversified ways of implementing digital technologies are determined by various endogenous and exogenous factors which can be referred to particular entities and analytical dimensions.

The digital transformation and time-space compression transforms the world into McLuhan’s global village, in which companies and consumers achieve their objectives (McLuhan, 1962). Domestic market competition shifts to the level of the global digital market, and “round the corner” shops move their operations to virtual space. Such competition poses major threats to market participants – sellers and buyers, and, in a broader scale, governments and integration groups.

A technological revolution poses a number of challenges for companies (Mazurek, 2019, pp. 24–25 and 49–51; Kotler et al., 2018) – the necessity of developing new business models (Osterwalder & Pigneur, 2010; Adamik, 2019, pp. 13–31; Pietrewicz, 2019, pp. 32–52) and creating new values, 4P and 4C digitization, the opening up of companies and their presence in the unrestricted web, active and two-way communication with markets, information activities on digital communication platforms in social media, etc. (Young, 2019). Market offerings comprise not only digital information on products (online advertising) but the entire offering package including its digital user aspects. Under the conditions of market virtualization, all

companies, to varying degrees, operate as e-firms, and buyers as consumers who actively mark their presence on the web, expressing their expectations and assessments of sales offerings (Wiktor, 2016).

When we treat the market as a place and form of seller-buyer relationships, we stress the significance of digital technologies in transforming it into e-markets and e-commerce. This trend is irreversible – e-commerce is a key area of the technological transformation of the world, all countries and all sectors.

The digital transformation revolutionizes market structures and mechanisms. E-commerce becomes a link between the achievements of digital technologies, the internet and its tools and infrastructure, new corporate management models, and e-consumers' market behavior patterns (Suchánek, 2012). The development of e-commerce at global, international and transborder levels requires a specific environment – the removal of possible social, legal and technical barriers which could adversely affect its possible benefits and potential.

3. The EU Digital Single Market Strategy – Its Implications for E-Commerce Development

The above conditions of the digital transformation can be referred to the objectives of the programme launched by the European Commission and the Parliament entitled “The Digital Single Market Strategy” (European Commission, 2015) The common objective is to use available resources and achieve multidimensional effects of the technological transformation and revolution. The programme aims to accelerate economic growth in all member states, increase the efficiency of economies, markets and enterprises, create jobs, especially for young people with digital qualification, and, consequently, to increase the EU's global economic competitiveness in the context of the digital economy and society (IDESI indices). Each objective combines various aspects related to macro- and microeconomics, state and companies (European Commission, 2015, p. 3, footnote 1; see also Śledziwska et al., 2017, pp. 31–44). The presented analysis is selective and corresponds to the objectives of this paper, and it focuses on the implications of the DSM for e-commerce development in its transborder dimension.

The DSM strategy was originally founded on the identification of barriers to free movement of digital services and e-commerce development in transborder relations, or, in a broad sense, in the entire territory of the single market. In the past, the EU digital market was greatly affected by national regulation and its diversity. The existing barriers resulted from differences in regulating telecommunication markets, frequency management and channel assignment, data management, copyrights including digital content and personal data protection as well as consumer rights protection in online

services, barriers to transborder online services (as a result of differences in VAT systems and procedures, statutory warranties for legal defects and other guarantees related to digital product content, the complexity and changeability of national regulations, etc.), and e-commerce related activities.

Formally, the DSM is a strategic legislative programme which aims to create a borderless digital space and converge legislation in the area of the EU's digital economy. The assumptions of the DSM strategy correspond to the concept of the EU single market. These two concepts have much in common: harmonization activities, barriers to integration, the creation of a customs union and implementation of the 4 freedoms – the foundation of the single market. The prerequisite for implementing these freedoms has been the removal of a number of barriers to integration in the area of political, legal, administrative, fiscal, technical and other issues (*“bringing down barriers to unlock online opportunities”*, European Commission, 2015). The characteristics of the single market can be referred to the creation of the EU Digital Single Market. The DSM is described in the Strategy as the space which *“ensures the free movement of persons, services and capital and [in which] individuals and businesses can seamlessly access and exercise online activities under conditions of fair competition”* (European Commission, 2015). The DSM can be considered in two dimensions. The first one refers to actual processes and the establishment of business relations – the sales and purchase of specific goods and products related to digital technologies (equipment, software, networks, applications, infrastructure, etc.), and the possibility of the purchase of goods and services in the virtual environment. The other dimension refers to conceptual, formal and legal areas which define a single and legally binding digital space.

The DSM is built on three pillars:

- 1) better access for consumers and businesses to the market of online goods across Europe,
- 2) the right conditions for developing digital networks and services,
- 3) conditions for the quick and sustained development of the EU based on the digital economy.

Each of the DSM pillars has its own characteristics – in a conceptual dimension as well as with regard to action plans, tools and potential effects. Because of the limitations of the paper, attention is given here mainly to a group of undertakings related to transborder e-commerce. These issues constitute the core of strategies set out in the first pillar, being the components of the remaining pillars. Pillar 1 sets directions for developing transborder digital trade. It aims to eliminate the discrimination of businesses and consumers (resulting from geo-blocking (European Council, 2018b), unjustified denial of access to web pages in other countries, or restrictions on the purchase of goods abroad and to facilitate companies' transborder trade activities: online sales and purchases across the European market and consumers' access to goods and services offered in foreign markets.

Pillar 2 refers to creating equal conditions for the “flourishing of digital networks and innovative services”. Obviously, the development of the digital market requires continuous improvements in infrastructure, networks and services – the basis for all other development undertakings and activities. The significance of these issues results from diversified regulation systems in telecommunication markets, the isolation and fragmentation of national markets (including different levels of developing broadband networks, the principles of selling radio spectrum rights at national levels, 5G networks, etc.). Pillar 2 sets out rules for converging legal systems for e-commerce platforms, internet shops, social media, protecting the digital market against the increasingly strong position of some European e-commerce platforms, the principles of managing user and consumer data, the ways in which they can be used to influence consumers, information security issues, and building confidence in digital services, the online economy, etc. Finally, Pillar 3 comprises issues which go beyond the area of e-commerce – it sets directions for economic growth based on the digital economy and the creation of “the European market of the future”.

The DSM strategy, presented here as an outline of its structural and functional objectives, is the European Union’s response to the challenges of the digital transformation of the contemporary world. It identifies the barriers to the development of the digital market in the European space and sets directions for legal changes, creating the right conditions for building a sound e-economy and a modern digital society in all EU member states.

4. E-Commerce Development Diversification in Czechia, Poland and Slovakia – Similarities and Differences

A comparative analysis of e-markets in Czechia, Poland and Slovakia is based on the major criteria employed in the assessment of e-commerce. They are as follows: 1) the value of a market, its potential and development trends, 2) the structure of industry-based sales, 3) the characteristics of the e-consumer segment from the perspective of major market segmentation criteria.

The comparative analysis is focused on the identification of similarities and differences in e-commerce development in the analyzed countries and country characteristics, while assessments refer to EU DSM strategies, including the development of transborder online trade. The comparability of data is based on a uniform methodological approach and statistical data from Statista (Statista Global Consumer Survey), presented in analytical reports (Methodology, 2019). This issue is significant from a scientific perspective – statistical data cited by various institutions presents different definitions of e-commerce, different periods, structures of information (Eurostat, European Report, 2018), etc. The value of the e-commerce market in the analyzed countries in 2017–2023 is presented in Table 1.

| Country/ EU | 2017 | 2018 | 2019 | 2020 | 2023 | Dynamics 2023/2019 | CAGR (2017–2023) |
|-------------|--------|--------|--------|--------|--------|-----------------------|---------------------|
| Czechia | 2,115 | 2,219 | 2,368 | 2,548 | 2,984 | 126.0 | 5.9 |
| Poland | 6,612 | 7,429 | 8,581 | 9,963 | 13,351 | 155.6 | 12.4 |
| Slovakia | 713 | 758 | 822 | 906 | 1,122 | 136.5 | 7.9 |
| EU | 258.77 | 278.89 | 306.56 | 339.61 | 424.33 | 163.9 | 8.5 |

Tab. 1. The value of the e-commerce market in Czechia, Poland and Slovakia in in 2017–2013 (EUR millions). Source: Statista, (last update: 2019–09, The years 2019–2023 – this is the forecast). Source: eCommerce Czechia. (2019). <https://www.statista.com/outlook/243/132/ecommerce/czechia#market-revenue> [3.10.2019]; eCommerce Poland. (2019). <https://www.statista.com/outlook/243/146/ecommerce/poland> [3.10.2019]; eCommerce Slovakia. (2019). <https://www.statista.com/outlook/243/151/ecommerce/slovakia> [3.10.2019].

Understandably, the value of e-markets in the three countries is different due to their populations and other socioeconomic factors. The nominal value of markets is a starting point for international comparative analyses and for creating country rankings. E-commerce markets in Czechia, Poland and Slovakia represent a small fraction of EU total sales volumes. In 2019, e-commerce volumes in Czechia accounted for 0.77% of the EU market, in Poland – 2.80%, and in Slovakia – 0.27%. The expected figures for the year 2023 are as follows: 0.70%, 3.15% and 0.28%, respectively.

A significant role is played by an assessment of market dynamics and industry structure. Market dynamics is presented for two periods – 2017–2018 (a historical assessment) and 2019–2023 (an assessment based on Statista GCS forecasts). In the first period, the following values are recorded for the particular countries: 104.5% in Czechia, 112.3% in Poland, and 106.3% in Slovakia. The results of the analysis for the second period (2019–2023) point to a significant but diversified growth of e-markets: 126.0% (Czechia), 136.5% (Slovakia), and up to 155.6% (Poland). The average growth rate for the three countries up to the year 2023 is 139.4%, slightly exceeding EU projections (163.9%). The average index for the three countries also reflects considerable differences between them, similarly to CAGR (Compound Annual Growth Rate) for the 2017–2023 period.

The industry structure of e-commerce is presented in Table 2. A comparative analysis should give attention to two aspects which are significant from a methodological perspective: changes of structures in space and changes in the course of time. The presented data points to great e-market industry differences as well as diversified e-commerce structures in the analyzed countries. Czechia and Poland are dominated by the Fashion sector (the average structure of sales in 2017–2023 at the level of 33.5% and 46.9%, respectively, similarly to the EU as a whole (Fashion, 2019 = 28.9%)). The largest market in Slovakia is Electronic & Media (the average value in 2017–2023 = 36.7%). The lowest volumes of online shopping are recorded in

the three countries on the Food & Personal Care market (Czechia – 9.5%, Poland – 7.5%, Slovakia – 2.5%). Such a situation is attributed to the stability of shopping patterns and behaviors and customer preferences (grocery shopping), the scale and character of migration (the so-called shopping tourism), production and demand structures in domestic markets, and the activities of e-commerce companies in the import of Fashion, Electronic & Media, and Toys Hobby & DIY products (eCommerce Czechia, 2019; eCommerce Poland, 2019; eCommerce Slovakia, 2019).

Another important conclusion can be drawn from the analysis of the visible stability of market industry structures in 2017–2023. The presented data indicates, to put it figuratively, the petrification of structures in the course of time. This process occurs in specific conditions and has implications both for consumers and firms. The second aspect relates to the visible stability and predictability of the particular e-market sectors in Czechia, Poland and Slovakia. This conclusion is significant from the perspective of the strategic analysis of companies, including decisions related to a possible entry into overseas markets and the forms of companies' presence in international markets in the e-commerce sector. In this context, attention should also be given to the causes of the DSM strategy and the development of transborder trade. The stabilization of sectoral boundaries – in the context of a strategic analysis – is a strong incentive to make relevant decisions.

| Country, years | Fashion | Electronic & Media | Food & Personal Care | Furniture & Appliances | Toys Hobby & DIY | Total |
|----------------|---------|--------------------|----------------------|------------------------|------------------|-------|
| Czechia | | | | | | |
| 2017 | 31.9 | 33.7 | 9.6 | 11.7 | 13.2 | 100.0 |
| 2019 | 33.2 | 32.1 | 9.5 | 12.2 | 12.2 | 100.0 |
| 2023 | 35.3 | 29.4 | 9.4 | 13.1 | 12.8 | 100.0 |
| Poland | | | | | | |
| 2017 | 45.9 | 18.1 | 7.4 | 10.9 | 17.6 | 100.0 |
| 2019 | 47.0 | 17.9 | 7.5 | 12.1 | 15.6 | 100.0 |
| 2023 | 47.9 | 17.6 | 7.5 | 13.8 | 13.2 | 100.0 |
| Slovakia | | | | | | |
| 2017 | 17.3 | 37.6 | 2.4 | 12.8 | 29.9 | 100.0 |
| 2019 | 18.0 | 37.7 | 2.6 | 13.5 | 28.1 | 100.0 |
| 2023 | 17.8 | 34.7 | 2.5 | 13.9 | 22.9 | 100.0 |

Tab 2. Industry structure of the e-commerce market in Czechia, Poland and Slovakia in 2017–2023 (in percentages). Source: As in Table 1, authors' calculations.

A significant role in comparative analysis is played by an assessment of relative ratios, which facilitates a methodologically well-grounded analysis of a given problem. Table 3 presents two basic ratios used in assessing

the e-economy and the development of the digital society (DESI, 2019). Penetration Rate (PR) points to a high level of the use of the internet in Czechia, Poland and Slovakia. In 2019, the average (common) PR index for this group of countries – apart from some internal differences – is 72.4%, exceeding the average value for all EU member states (70.1%) by 2.3 points. Projections for the year 2023 indicate a further (and diversified) increase in PR values up to 78.2% (EU average value – 76.1%). It testifies to a large scale and universal character of the digital transformation, easy access to the internet and the development of the information society in the analyzed countries, and it indicates the existence of a favorable environment for developing e-commerce companies based on the anticipated growth of the market potential (increased demand).

PR indices are significantly correlated with user activities in online shopping. In-depth analyses indicate that the majority of users, or nearly all of them in the analyzed countries, are e-consumers (2018): in Czechia – 70%, Poland – 61%, and Slovakia – 71%. These ratios are comparable with EU average values – 69% (“Elektronika i léky online”, 2019; “Raport Interaktywnie.com: E-commerce”, 2019; “Digital Markets, eCommerce. Slovakia”, 2019; Král, 2019).

The second index, ARPU, reflects the per unit (per capita) value of sales on the IT market. The cognitive value of this measure plays a key role in comparative analyses (*ceteris paribus*). In 2019, ARPU in the analyzed countries is diversified: Czechia – 293.19 euros per inhabitant, Poland – 325.68, and Slovakia – 209.14. The differences correspond to 1–1.56 relation, which can be considered as significant. In relation to the value of ARPU for the EU (515.82 euros per inhabitant – 2019), the average ratio for the analyzed countries (276.00 euros) is significantly lower, representing 53.5% of the European value. The reasons for this situation are presented above – they also apply to the described phenomena.

A significant component of the analysis is the description of internet users and online buyers (Table 4). E-consumers’ profile is based on the major socioeconomic consumer criteria which are widely employed in market segmentation and internet analyses. The presented data leads to an important conclusion. Web users and e-consumers in Czechia, Poland and Slovakia are similar in terms of gender, age and disposable income (or their own assessment of income). In the analysis, females account for 51.9% of users, and the respective differences between the analyzed countries are not significant. The users-by-age analysis indicates a high degree of similarity in the social structure of users in Czechia, Poland and Slovakia. This distribution is close to normal distribution. A similar conclusion is drawn from the users-by-income analysis. It is a visibly equal distribution from the perspective of three levels of users’ income assessment (low, medium and high income). This distribution corresponds to the structure of users at EU average levels.

| Basic ratios; country | 2017 | 2018 | 2019 | 2020 | 2023 | Difference in points 2023/2019 |
|--------------------------------------|--------|--------|--------|--------|--------|---|
| 1. Penetration Rate (in percentages) | | | | | | |
| Czechia | 72.1 | 73.8 | 75.6 | 77.4 | 82.1 | +6,5 |
| Poland | 64.2 | 66.9 | 69.5 | 72.1 | 78.4 | +8,9 |
| Slovakia | 71.2 | 71.5 | 72.0 | 72.6 | 74.1 | +2,1 |
| EU | 66.1 | 68.1 | 70.1 | 71.9 | 76.1 | +10,0 |
| 2. ARPU (in euros) | | | | | | Dynamics (in percentages) 2023/2019 |
| Czechia | 275.63 | 281.82 | 293.19 | 307.27 | 338.34 | 15.4% |
| Poland | 271.49 | 292.78 | 325.68 | 365.35 | 452.18 | 38.8% |
| Slovakia | 183.60 | 194.26 | 209.14 | 228.49 | 277.53 | 32.7% |
| UE | 463.59 | 483.27 | 515.82 | 555.83 | 655.39 | 41.4% |

Tab. 3. PR (Penetration Rate) and ARPU in Czechia, Poland and Slovakia as compared with the EU. Source: As in Table 1, authors' calculations.

| Criteria | Czechia | Poland | Slovakia |
|------------------------|---------|--------|----------|
| 1. Users by gender (%) | | | |
| Female | 52.1 | 51.5 | 52.1 |
| Male | 47.9 | 48.5 | 47.9 |
| 2. Users by age (%) | | | |
| 18–24 years | 13.0 | 14.3 | 13.0 |
| 25–34 | 23.7 | 28.5 | 23.7 |
| 35–44 | 23.3 | 27.5 | 23.3 |
| 45–54 | 22.9 | 16.3 | 22.9 |
| 55–64 | 17.0 | 13.4 | 17.0 |
| 3. Users by income (%) | | | |
| low income | 30.5 | 29.9 | 30.5 |
| medium income | 34.4 | 35.4 | 34.4 |
| high income | 35.1 | 34.7 | 35.1 |

Tab. 4. User characteristics – Czechia, Poland, Slovakia (2017). Source: As in Table 1, Statista Global Consumer Survey, last update: 2018–07.

In light of an in-depth query (also based on an extensive business literature review), we stress some other characteristics of the analyzed national markets. They relate to the transborder character of purchases, the place of online shopping, and payment methods. Polish consumers are characterized by the fact that 94% of total e-commerce purchases are made on the domestic market (Statista.Pl., 2019). Lower rates are recorded for Czech and Slovak consumers. Approximately 3/4 of Czechs and Slovaks make purchases in domestic e-shops, 13% – in shops based in other EU countries, and 13% – in the USA (“Přes internet nakupuje pravidelně třetina Čechů”, 2019). The presented situation results from another significant

factor – the position and popularity of foreign shopping portals including the Chinese AliExpress (part of Alibaba). The asymmetric business breakdown structure (dominated by great portals Amazon and Allegro) is characteristic of the Polish market. The analyses of the Czech market stress a great significance and market position of Czech online shops competing with global platforms (“Přes internet nakupuje pravidelně třetina Čechů”, 2019; eCommerce Czechia, 2019; Klich, 2019b). Czechs prefer small e-shops, while Poland and Slovakia choose auction platforms. The Slovak market is characterized by a great significance of social media. Nearly 50% of Slovaks (46%) make purchases using social portals (“European Ecommerce Report 2018 Edition”, 2018; eCommerce.Slovakia, 2019; Klich, 2019a; “Raport Interaktywnie.com: E-commerce”, 2019; McKinsey, 2019).

Importantly, the analysis stresses a high level of social approval given to e-commerce in each analyzed country. A number of e-commerce analyses and surveys clearly indicate that Czechs, Poles and Slovaks are “fond of” e-commerce – they have increasing confidence in it, understand the possibilities of making buying decisions and a wider and deeper assortment of goods, they demonstrate a greater sense of security, and appreciate the legal protection of purchases, improvements in the quality of transactions and the proper behaviors of e-sellers. “*Fashion for a digital lifestyle*” (Isaacson, 2011, p. 472), and online shopping is a clear characteristic of market behavior of Czechs, Poles and Slovaks.

5. Discussion and Conclusions

The presented analysis describes the status, conditions and development trends in e-commerce in Czechia, Poland and Slovakia. The three analyzed countries are – to a large degree – uniform in terms of cultural, historical and economic aspects. They are characterized by specific historical heritage and experience. They are EU member states, and represent similar levels of economic advancement, including achievements in building the digital economy and information society (similar DESI index values). The development of e-commerce in these countries is similar, but it is also characterized by considerable differences. The similarities refer to the level of informatization including PR indices, the socioeconomic characteristics of users and e-consumers, development projections until 2023, and the social acceptance of online shopping. Simultaneously, the analyzed countries have diversified industry structures of online markets, they differ in the values of ARPU indices and record considerably lower values of online shopping per capita as compared with average EU standards (53.5%). Limitations in developing transborder trade are due to similar factors as in other EU member states. The particular components of the DSM strategy, in each of the three pillars (presented in Section 2), target all countries, companies

and consumers (European Council, 2017; European Council, 2018a), providing a clearly defined platform for the digital transformation of markets (European Council, 2019a) and the development of the e-economy and information society (European Council, 2019d; European Council, 2019b; European Commission, 2019).

The article, by its nature, has its limitations. They result from the concentration of considerations on the formal side of DSM – assessment of the DSM project architecture, its priorities and identification of opportunities and conditions of its implementation in each member country.

The problem of diversifying e-commerce development in three countries is general and limited in the space of analysis. The analysis of e-commerce development in the Czechia, Poland and Slovakia is based, however, on specific principles of methodology and scientific research (*ceteris paribus*) and also indicates the directions and areas of scientific research on the title problem. These issues can be an interesting and important area of interdisciplinary research. In management sciences, the DSM construction process creates a new field of enterprise research in the single space of the EU digital market. The research may concern examples of such issues as: large-scale project management – this is the nature of the DSM project, strategic management in the new macro environment created by the DSM program, international expansion strategy, development of transborder trade by enterprises from various EU countries, innovation strategy and digital transformation, development of transborder trade by enterprises from various EU countries, innovation strategy and digital transformation, hybridization strategies for the harmonization of off-line and online activities of European enterprises, development strategies for small and medium-sized enterprises, including market creation and international expansion of start-ups. The EU Digital Single Market strategy is a clear incentive for new, original research projects on enterprise management in the two-dimensional space of the European market and the new macro-environment that DSM creates. The creation of international research teams will be beneficial for implementing such scientific projects. The result of such cooperation is the article being presented.

Acknowledgements

This research received no funds.

Endnotes

- ¹ The DESI index comprises 5 components, calculated as weighted average: 1. Connectivity (25%) 2. Human capital (25%), 3. The use of the Internet (15%), 4. Integration of digital technologies (29%) and 5. Digital public services (15%). (DESI, 2019).
- ² In Statista methodology, “*Key Market Indicators give an overview of the demographic, economic and technological development of the selected region on the basis of general*

KPIs. The calculation of Statista's Market Outlook is based on a complex market-driver logic including over 400 region-specific data sets". "The eCommerce data is based on Statista primary research (Statista Global Consumer Survey), bottom-up modeling, market data from independent databases and third-party sources, analysis of various key market and macroeconomic indicators, historical developments, current trends, reported performance indicators from the key market players, and Statista interviews with market experts. The following categories are not included in the eCommerce market: digitally distributed services, digital media downloads or streaming services, online booking of plane and concert tickets, etc. B2B eCommerce and purchase or resale of goods are not included either" (Metodology, 2019).

References

- Adamik, A. (2019). Creating a competitive advantage in the age of industry 4.0. *Problemy Zarządzania – Management Issues*, 17, 2(82), 13–31.
- Andersson, P., Movin, S., Mähring, M., Teigland, R., & Wennberg, K. (Eds.) (2018). *Managing digital transformation*. Stockholm School of Economics Institute for Research (SIR).
- Baker, M. (2014). *Digital transformation*. CreateSpace Independent Publishing Platform.
- Castells, M. (2009). *The rise of the network society*. Blackwell.
- Caudron, J., & Van Peteghem, D. (2014). *Digital transformation: A model to master digital disruption*. Cork. Retrieved on 30 September 2019 from <https://www.duvalunionconsulting.com/wp-content/uploads/2016/08/Digital-Transformation-Book-Digital-Leadership.pdf>.
- Digital Markets, eCommerce.Slovakia. (2019). Retrieved on 3 October 2019 from <https://www.statista.com/outlook/243/151/e-commerce/slovakia>.
- eCommerce Czechia. (2019). Retrieved on 3 October 2019 from <https://www.statista.com/outlook/243/132/e-commerce/czechia#market-revenue>.
- eCommerce Poland. (2019). Retrieved on 3 October 2019 from <https://www.statista.com/outlook/243/146/e-commerce/poland>.
- eCommerce Slovakia. (2019). Retrieved on 3 October 2019 from <https://www.statista.com/outlook/243/151/e-commerce/slovakia>.
- Elektronika i léky online. Češi jsou v Evropě šampióny v nákupu na internetu. (2019). Retrieved on 1 October 2019 from <https://echo24.cz/a/ScVML/elektronika-i-leky-online-cesi-jsou-v-evrope-sampiony-v-nakupch-na-internetu>.
- European Commission. (2015). Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions. A Digital Single Market Strategy for Europe {SWD(2015) 100 final}. Retrieved on 20 September 2019 from <https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:52015DC0192&from=EN>.
- European Commission. (2019). *New EU rules on e-commerce*. Retrieved on 3 October 2019 from <https://ec.europa.eu/digital-single-market/en/new-eu-rules-e-commerce>.
- European Council. (2015). *Digital single market*. Retrieved on 25 September 2019 from <https://ec.europa.eu/digital-single-market/en/>.
- European Council. (2017). *Consumer protection in the digital age: Council adopts regulation to strengthen EU-wide cooperation*. Retrieved on 24 September 2019 from <https://www.consilium.europa.eu/en/press/press-releases/2017/11/30/consumer-protection-in-the-digital-age/>.
- European Council. (2018a). *Digital Europe programme – Council agrees its position*. Retrieved on 23 September 2019 from <https://www.consilium.europa.eu/en/press/press-releases/2018/12/04/digital-europe-programme-council-agrees-its-position/>.

- European Council. (2018b). *Geo-blocking: Council adopts regulation to remove barriers to e-commerce*. Retrieved from on 24 September 2019 from <https://www.consilium.europa.eu/en/press/press-releases/2018/02/27/geo-blocking-council-adopts-regulation-to-remove-barriers-to-e-commerce/>.
- European Council. (2019a). *EU introduces transparency obligations for online platforms*. Retrieved on 20 October 2019 from <https://www.consilium.europa.eu/en/press/press-releases/2019/06/14/eu-introduces-transparency-obligations-for-online-platforms/>.
- European Council. (2019b). *Increased transparency in doing business through online platforms*. Retrieved on 3 October 2019 from <https://www.consilium.europa.eu/en/press/press-releases/2019/02/20/increased-transparency-in-doing-business-through-online-platforms/>.
- European Council. (2019c). *International Digital Economy and Society Index*. Retrieved on 1 October 2019 from <https://ec.europa.eu/digital-single-market/en/news/international-digital-economy-and-society-index>.
- European Council. (2019d). *Post-2020 digital policy – Council adopts conclusions*. Retrieved on 30 September 2019 from <https://www.consilium.europa.eu/en/press/press-releases/2019/06/07/post-2020-digital-policy-council-adopts-conclusions/>.
- European Commerce Report 2018 Edition. (2018). Retrieved from on 10 October 2019 from <https://www.retailinsiders.nl/docs/77f3cdc4-38b2-4dd2-8938-cb4293cc8c19.pdf>.
- Harari, Y. N. (2018). *21 lessons for the 21st century*. London: Jonathan Cape.
- Isaacson, W. (2011). *Steve Jobs*. Insignis Media.
- Kelly, K. (1998). *New rules for the new economy. 10 radical strategies for a connected world*. Viking Penguin.
- Klich P. (2019b). *Rynek e-commerce w Czechach*. Retrieved from on 5 October 2019 from <https://blog.arvato.pl/rynek-e-commerce-w-czechach/>.
- Klich, P. (2019a). *Charakterystyka rynku e-commerce na Słowacji*. Retrieved on 24 September 2019 from <https://blog.arvato.pl/2019/06/19/charakterystyka-rynku-e-commerce-na-slowacji/>.
- Kotler, Ph., Kartajaya, H., & Setiawan, I. (2018). *Marketing 4.0. Moving from traditional to digital*. John Wiley & Sons.
- Kráľ, M. (2019). *Ako vyzerá slovenský e-commerce trh – rýchly prehľad*. Retrieved on 3 October 2019 from <https://www.ecommercebridge.sk/ako-vyzera-slovensky-e-commerce-trh-rychly-prehľad/>.
- Mazurek, G. (2019). *Transformacja cyfrowa. Perspektywa marketingu*. Warszawa: PWN.
- McKinsey. (2019). *The rise of digital challengers*. Retrieved on 18 September 2019 from <https://www.mckinsey.com/pl/~media/McKinsey/Locations/Europe>.
- McLuhan, M. (1962). *Gutenberg galaxy*. University of Toronto.
- Methodology. (2019). Retrieved on 2 October 2019 from <https://www.statista.com/outlook/243/146/ecommerce/poland#market-marketDriver>.
- Osterwalder, A., & Pigneur, Y. (2010). *Business model generation : A handbook for visionaries, game changers, and challengers*. John Wiley and Sons.
- Pietrewicz, L. (2019). Technology, business models and competitive advantage in the age of Industry 4.0. *Problemy Zarządzania – Management Issues*, 17, 2(82), 32–52.
- Pres internet nakupuje pravidelně třetina Čechů. (2019). Retrieved on 6 October 2019 from <https://www.e15.cz/magazin/pres-internet-nakupuje-pravidelne-tretina-cechu-975450>.
- Raport Interaktywnie.com: E-commerce 2019. (2019). Retrieved on 6 October 2019 from <https://interaktywnie.com/biznes/artykuly/raporty-teraktywnie-com/raport-teraktywnie-com-e-commerce-2019-258454>.
- Reddy, S., & Reinartz, W. (2017). Digital transformation and value creation: Sea change ahead. *Value in the Digital Era*, 9(1), 11–17.
- Rothbard, M. N. (2005). *Man, economy and state*. Ludwig von Mises Institute.
- Schwab, K. (2016). *The fourth industrial revolutions*. Geneva: World Economics Forum. Polish edition: *Czwarta rewolucja przemysłowa* (2018). Wydawnictwo Studio Emka.

- Skinner, Ch. (2018). *Digital human. The fourth revolution of humanity includes everyone*. Wiley.
- Śledziwska, K., Włoch, R., Słok-Wódkowska, M., Mazur, J., Paliński, M., & Syliwoniuk, M. (2017). *Przewodnik po Jednolitym Rynku Cyfrowym dla MŚP [Guide to the Digital Single Market for SMEs]*. DELab.UW.
- Statista.Pl. (2019). Retrieved on 25 September 2019 from <https://www.statista.com/outlook/243/146/ecommerce/poland#market-crossBorder>.
- Suchánek, P. (2012). *E-commerce: elektronické podnikání a koncepce elektronického obchodování [E-commerce: Digital entrepreneurship and the concept of digital commercial activity]*. Praha: Ekopress.
- Topfler, A. (1980). *The third wave*. Bantam Books.
- Webster, F. (2014). *Theories of the information society*. Routledge.
- Westerman, G., Bonnet, D., & McAfee, A. (2014). *Turning technology into business transformation*. Harvard Business Press.
- Wiktor, J.W. (2016). Marketing communication in hypermedia computer-mediated environments vs the paradigm of a network society. *International Journal of Business and Globalisation*, 127(3), 297–298.
- Young, M. (2019). *Ogilvy über Werbung im digitalen Zeitalter*. München: Vahlens Verlag.
- Zacher, L. (Ed.). (2013). *Wirtualizacja. Problemy, wyzwania, skutki*. Warszawa: Poltext.