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**E-COMMERCE AS A FACTOR OF
INNOVATIVE DEVELOPMENT OF
ENTERPRISES**

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Introduction. Nowadays information and communication technologies delved into almost all spheres of human life, and this has also affected the economic sphere. Internet has opened up new opportunities for various financial transactions and commodity circulation, moreover, network technologies are gradually replacing and becoming dominant forms of relationships in society.

Hypothesis of scientific research. Fast development of the entire spectrum of communication services will help to realize the potential of Ukraine in the field of e-commerce and increase the competitiveness of Ukrainian business.

Aim of this research is the search of the most effective tools and forms of usability of e-commerce as a factor of enterprise innovation development.

Methods of investigation: theoretical generalization – to clarify the conceptual apparatus of e-commerce; statistical and comparative analysis – to evaluate the state of activity of enterprises in the online and offline markets; expert assessments – to process the opinions of experts and to

build a dynamic personalized matrix of positioning ranking places of Ukrainian regions by purchasing online activity of population.

Results of research. The classification of e-commerce models by four features has been improved; a dynamic personalized ranking matrix of ranking places of Ukrainian regions by purchasing online activity of the population is proposed and constructed.

Conclusions: the formed matrix of assessment of the level of e-commerce development of individual entities allows us to choose one or another form of online business, depending on the goals that are set for them and the ways to achieve these goals; optimize the range of products sold through the Network, increase sales in the regions, which will allow the entrepreneur to choose the most relevant e-commerce destinations for themselves or for their existing projects.

Keywords: e-commerce; network economics; Internet commerce; online and offline markets; dynamic personalized matrix.

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ЕЛЕКТРОННА КОМЕРЦІЯ ЯК ФАКТОР ІННОВАЦІЙНОГО РОЗВИТКУ ПІДПРИЄМСТВ

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Вступ. На сьогоднішній момент інформаційно-комунікаційні технології проникли майже в усі сфери життя людини, торкнулося це і економічної сфери. Інтернет відкрив нові можливості для здійснення різних фінансових операцій, руху товарообігу, більш того, мережеві технології поступово витісняють, стають домінуючими формами взаємовідносин в суспільстві.

Гіпотеза дослідження. Прискорений розвиток усього спектра комунікаційних послуг дасть змогу реалізувати потенціал України у сфері електронної торгівлі та підвищити конкурентоспроможність українського бізнесу.

Метою даної статті і є пошук найбільш ефективних інструментів та форм використання електронної комерції як фактору інноваційного розвитку підприємства.

Методи дослідження: теоретичного узагальнення – для уточнення понятійного апарату електронної комерції; статистичного та порівняльного аналізу – для оцінки стану діяльності підприємств на онлайн-ових і оффлайн-ових ринках; експертних оцінок – для обробки думок експертів та побудови динамічної персоніфікованої

матриці позиціонування рангових місць регіонів України за купівельною он-лайн активністю населення.

Результати. Удосконалено класифікацію моделей електронної комерції за чотирма ознаками; запропоновано та побудовано динамічну персоніфіковану матрицю позиціонування рангових місць регіонів України за купівельною он-лайн активністю населення.

Висновки. Сформована матриця оцінки рівня розвитку електронної комерції окремих суб'єктів дозволяє вибрати ту чи іншу форму он-лайн бізнесу в залежності від цілей, які перед ними стоять, і шляхів досягнення цих цілей; оптимізувати асортимент продаваних через Мережу товарів, збільшити продажі в регіонах, що дозволить підприємцю вибрати найбільш релевантні для себе або для своїх існуючих проєктів напрямки електронної комерції.

Ключові слова: електронна комерція; мережева економіка; торгівля в інтернеті; онлайн і оффлайн ринки; динамічна персоніфікована матриця.

Formulation of the problem. Modern stage of development of the world community is characterized by great socio-economic transformations, first of all the accelerated development of informatization of all spheres of public life. Modern technologies of global communication allow economic relations to exist in electronic form. The ability to interact with counter agents, regardless of distance, provides the advantage of electronic forms of interaction in general and business in particular. Undoubtedly, the developed computer and communication infrastructure becomes one of the key factors for the successful socio-economic development of a modern state and business activity of its citizens. Currently, e-commerce is gaining its significance. Its development is so rapid that most of the world's largest companies, along with traditional offline businesses, are beginning to use e-commerce. The formation of completely new economic, social and cultural relationships in people's lives comes against the backdrop of the emergence of a comprehensive electronic environment for economic activity, where a company or individual located anywhere in the economic system can easily communicate with any other company or an individual with less cost at the purpose of their common business for trading or sharing ideas. Analysis of the development of e-commerce is very relevant for Ukraine, because it allows the identification of ways to improve the efficiency of business and economy.

Analysis of recent research and unresolved part of the problem. The issues of formation and development of e-commerce are reflected in the works of domestic and foreign researchers such as: O. Shaleva [1], A. Grekhov [2], L. Ligonenko [3], P.P. Tanasyuk, K. Makoveychuk [4], etc. The economic aspects of the functioning of trading enterprises in the Internet are represented in the works of A. Ivanov [5], S. Karpenko [9] and some other scientists. However, taken into account that Ukrainian and foreign e-commerce is relatively young, the system of enterprise activity management with the help of modern information technologies, incl. e-commerce, are still under-researched.

The aim of the study is analyze the state of e-commerce in the regions of Ukraine based on a dynamic personalized matrix.

Results of research. Today, information and communication technologies have reached almost all spheres of human life, and this has also affected the economic sphere. The Internet has opened up new opportunities for various financial transactions and commodity circulation, moreover, network technologies are gradually replacing and becoming dominant forms of relationships in society. Various purchases / sales, remote services, various marketing activities and many other types of commercial activities produced in the Internet are all commonly referred to as "network economy", "e-commerce". In fact, e-commerce is the basis on which the network economy is built. E-commerce is a sphere of economy that includes all financial and trading

transactions carried out through computer networks and business processes related to such transactions [3]. Many researchers also refer to the term purely data sharing through various communications, and most importantly, the World Wide Web. It is worth noting that various television videos and other means of communication have long been used as a means of conducting operations in all civilized countries, however, the WWW has opened up new business opportunities – all possible economic operations became more realistically performed with minimal real-time costs both locally and internationally.

Here are the main features of e-commerce:

- application of various information systems and technologies for the implementation of transactions;
- the opportunity to make a profit traditionally, and more often with the help of various online analogues of real money and means of payment, using modern information technologies;
- the environment for the sale of assets which are used similar to informational networks of electronic transaction;
- the ability of both tangible and electronic assets (somehow translated into digitized form) to be quickly sold by the market price;
- constancy of transactions of the same type performed by the user and the existence of ability to measure these transactions by provider and possibility for by third-party auditors to certify them.
- securing the ownership of trade or the acquisition of assets, both traditional and modern, digital, electronic.

Today there exist several popular types of e-commerce. The most common are:

Trading information. These include a variety of constantly updated knowledge bases, databases, information services that are sharpened for specific needs such as radio broadcasting, reference systems, etc.

Electronic trading platforms. They refer to websites that present various lists of goods and services – a virtual analogue of conventional stores, with the ability to purchase selected products for cashless payment (or subsequent cash payment at the place of receipt) and delivery to the buyer through different channels, depending on the type of product.

Electronic banks. The main advantage of such organizations is the large range of services at low cost, which is due to the absence of various utilities, economic and other costs. Any customer with access to the Internet may also be potential customers of these banks.

Micropayments are gaining popularity. A situation where a buyer acquires the right to lease a portion of the software, programs that serve any purpose, for a small amount.

The main types of e-commerce components are [1]:

1. *Electronic data interchange (EDI)* – is an automated transfer between the parties to the agreement of various documents, files, etc., which facilitates the simplification and automation of information flows.

2. *Electronic funds transfer (EFS)* – is a system which conducts cashless payments, transferring funds. Electronic movement of capital is classified by the content of transactions (debit, credit), by their scope (eg, business transactions) or by types of operators (banks, providers). Transaction operators can also be virtual organizations (for example, services for exchanging virtual money).

3. *Electronic trade (e-trade)* – implementation of all kinds of transactions (purchase, sale) on the World Wide Web from the moment of demonstration / selection of the product, making the purchase, payment / receipt of the order, execution of delivery, to receipt of the goods.

4. *Electronic marketing (e-marketing)* – marketing activities aimed at increasing sales of a product through promotions, managing the information contained on the sites.

5. *Electronic banking (e-banking)* – traditional opportunities for working with the bank, implemented in the Internet.

6. *Electronic money (e-cash)* is an electronic analogue of real banknotes that can be used to make quick cash payments.

Depending on the parties involved, the following types of e-commerce are usually distinguished:

Business to consumer (B2C) – transactions take place between businesses and consumers. In B2C e-commerce, businesses sell products or services to end-users (consumers).

Business to business (B2B) – refers to operations carried out between two enterprises. Any company whose clients are other companies operate on the B2B model.

Consumer to business (C2B) – consumer e-commerce occurs when a consumer sells or contributes to the business. Many crowdsourcing companies can be attributed to this model.

Consumer to consumer (C2C) – C2C e-commerce happens when something is bought and sold between two consumers.

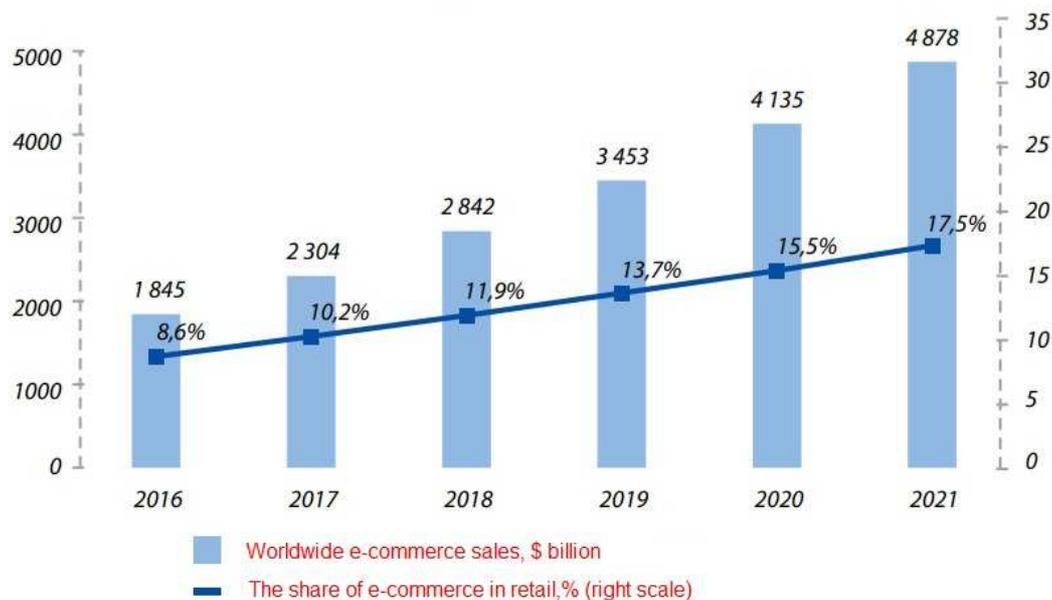
Government to business (G2B) – G2C transactions occur when a company pays for government goods, services, or pays taxes or fees through online telecommunication systems.

Business to government (B2G) – when the government uses online information and telecommunication systems, using the Internet to purchase goods or services from businesses, the transaction may fall under B2G e-commerce.

Consumer to government (C2G) – consumers who make administrative payments through online telecommunication systems using Internet may fall into this category.

The most spread e-commerce is in four major market segments, namely Business to Business (B2B), Business to Consumer (B2C), Consumer to Consumer (C2C) and Consumer to Business (C2B).

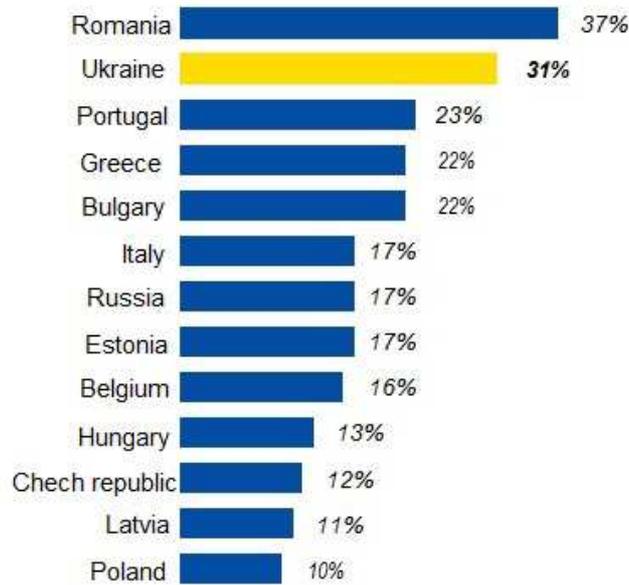
The dynamics of e-commerce usage is as follows. Thus, the volume of retail sales in the e-commerce market in the world for 2017 amounted to USD 2.3 trillion, which is 10.2% of the indicator of total retail sales [10]. At the same time, there is a steady tendency for the growth of share of e-commerce. It is expected that by 2021 it will reach 17.5% (Figure 1).



Source: [8–10].

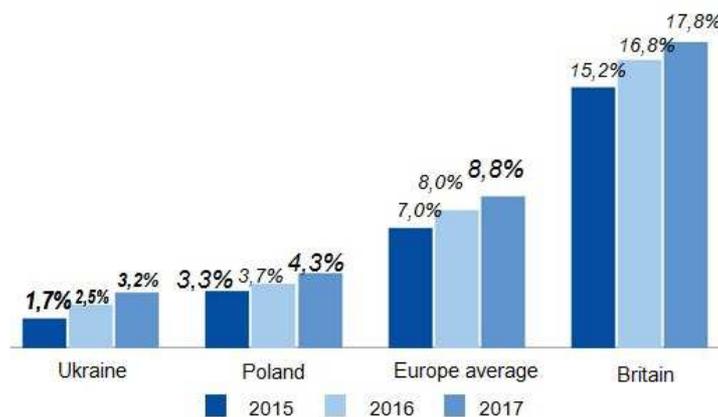
Figure 1. The amount of e-commerce sales in the world and the share of e-commerce in retail

In Ukraine this index is much lower than average in the world and lower than it's neighbors. At the same time, the growth rate of e-commerce is one of the highest in Europe, which shows a significant growth potential (Figures 2, 3). The approximate size of the domestic e-commerce market in 2017 was UAH 50 billion. As there is no data available on the sales volume of individual players, it is possible to assess the state of competition by the amount of traffic [10]. According to the data of the specialized site, the dominant positions are occupied by the portals prom.ua and Rozetka. However, in general, we can say that today there is competition between players in the market, as prom.ua is a marketplace that operates a large number of small businesses, and OLX a bulletin board for advertisements by individuals. In this case, the data from open sources reflect a slightly different distribution of income among the main players: EVO 28.4% (which can be explained by the presence in the group of other sites, except prom.ua: bigl.ua, shafa.ua, crafta.ua, etc.), 12% rozetka.com.ua (Figure 4).



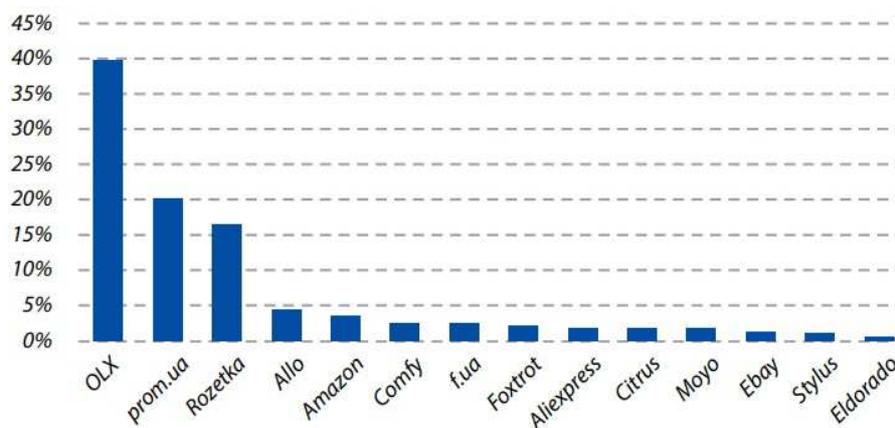
Source: [8–10].

Figure 2. E-commerce market growth rate in 2017



Source: [8–10].

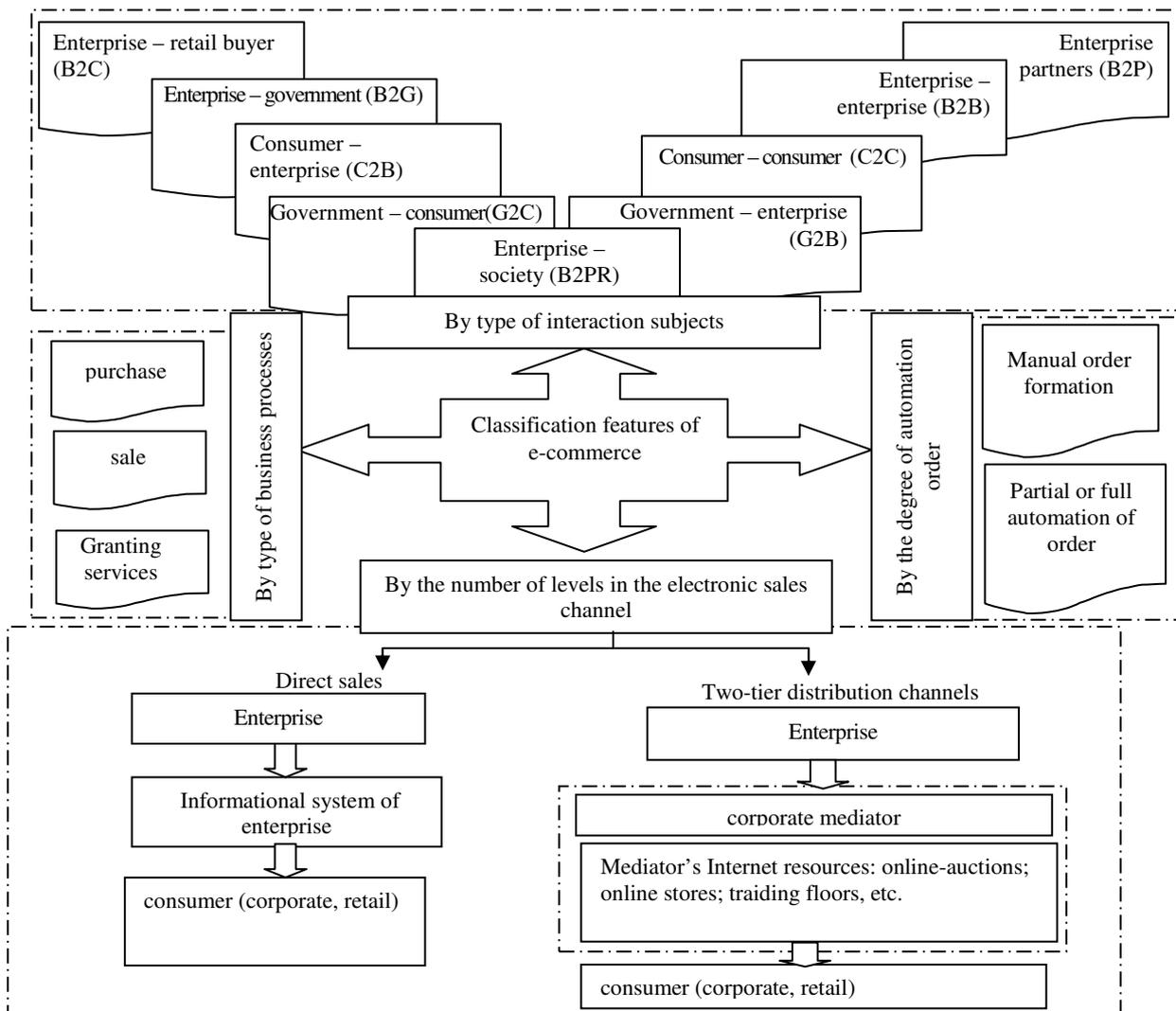
Figure 3. The share of e-commerce in retail sales



Source: [8–10].

Figure 4. Approximate shares of companies in the Ukrainian e-commerce market

The research of all existing electronic business models allowed us to offer an improved classification of e-commerce models with certain classification features: 9 types of models are distinguished by type of interaction subjects (enterprise-retail consumer (B2C), enterprise-government (B2G), consumer-enterprise (C2B)), government – consumer (G2C), enterprise – partners (B2P), enterprise – enterprise (B2B), consumer – consumer (C2C), government – enterprise (G2B), enterprise – society (B2PR); by type of business processes 3 types of models are distinguished: sales, purchase, provision of services; 2 types of models are distinguished by the degree of automation of the order: partial or full automation of the order and manual ordering; 2 types of models are distinguished by the number of levels in the electronic sales channel: direct sales (through own web-representations), two-level distribution channels (carried out through the Internet of intermediaries) (Figure 5).



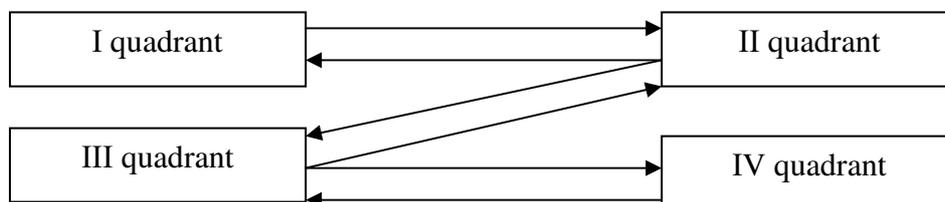
Source: Author's development.

Figure 5. The proposed classification of e-commerce

In Ukraine, there is an active development of e-commerce, which is accompanied by a significant turnover of capital, and the most promising are projects in the corporate sector. The success of the projects is the application of a single methodological and technological basis for managing financial, commodity, information flows and ensuring a complete cycle of marketing and trading operations. Nowadays in the sphere of e-commerce the following types of e-business intermediaries are used: universal trading houses, specialized sites, e-commerce centers, which help to improve the management of information and financial flows and allow to optimize the management of financial, commodity, labor and information resources.

The peculiarity of Ukrainian e-commerce is the concentration, mainly in some regions, which significantly reduces the potential audience. Let us evaluate the dynamics of e-commerce development at the regional level. In the economic practice of many countries, methods of determining the status of different entities (banks, businesses, industries, regions, etc.) have become widespread using ratings or rankings. Rating is the location of objects being investigated in a certain order, depending on the value of the rating. It is used to compare or sort objects over a period of time or to determine changes in a set of objects over a period. As a dimensionless measure, the rating has two features. First, when determining the state of an object, it can be calculated using both quantitative and attribute indexes in different combinations; Second, in most of the proposed methods rating valuations, the order of the objects (ordering within the sample) is decisive for the final decision, not for the numerical value of the rating.

For the analysis of the level of development of e-commerce it is proposed to use a methodology based on the calculation of ranks (places, positions) of certain Ukrainian regions by online purchasing activity. Based on the data obtained, a dynamic personalized matrix and a positioning matrix are constructed. This technique is used to calculate changes in the positions of the regions (Figure 6).



Source: Author's development.

Figure 6. Dynamic ranking matrix of ranking places of Ukrainian regions by online-purchasing activity of the population

The essence of the method of determining the rank of regions over a period of time is to compare the positions which they held at the initial stage, ranking up to the last date (for example, as of 2014 and 2018). One or more indicators

that characterize the activity of the region (in our case, the purchasing activity of the population in Internet) are selected for comparison [5; 8; 9]. The determined region ranks are used to construct a dynamic personalized ranking matrix, which provides for the division of the analyzed regions into four quadrants, depending on the position they occupied at the beginning and ending of the research period. On the basis of the division of regions, a dynamic matrix of positioning of their ranking places according to the index is built, which is taken as the basis for analysis [5; 8; 9].

The positioning matrix clearly shows the changes that have taken place over the selected period in the ranking of the regions. It allows you to identify regions where consumer capacity and living standards and degree of e-commerce development is high enough and has a stable rating (being in the same quadrant during the analyzed period) and those that have deteriorated or improved their position due to the changing socio-economic situation in the region. The first quadrant includes regions that occupied places 1 through 6 in the relevant years, the second – regions that occupied places 7 through 12, the third – places 13 through 19, and the fourth – places 20 through 25 (Table 1, author's calculations according to [5; 8; 9], in brackets the place for 2018 is given).

Table 1

**Dynamic personalized matrix of Ukrainian regions
for online purchasing activity in 2014 and 2018**

I quadrant		II quadrant	
Kyiv 1 (2) Odesa region 3 (3) Kharkiv region 5 (4) Dnipropetrovsk region 6 (6)	Zakarpatska region 4(12)	Kyiv region 9 (5)	Chernivtsi region 7 (9) Lviv region 7 (8) Volyn region 10 (12) Kherson region 12 (8)
		Poltava region 11 (15)	
III quadrant		IV quadrant	
	Zaporozhye region 15 (10)		
Mykolaiv region 13 (16) Kirovohrad region 14 (13) Donetsk region 17 (14) Rivne region 18 (18)	Khmelnysky region 16 (20) Ternopil region 19 (24)	Cherkasy region 20 (17) Lugansk region 25 (19)	Zhytomyr region 21 (20) Ivano-Frankivsk region 22 (21) Chernihiv region 23 (22) Vinnytsia region 24 (23) Sumy region 26 (25)

The dynamic personalized matrix of regions of Ukraine by purchasing online activity allows to conclude that most regions retained their positions. This applies to: Kyiv, Odessa, Kharkiv and Dnipropetrovsk regions – I quadrant;

Chernivtsi, Lviv, Volyn, Kherson – II quadrants; Mykolaiv, Kirovohrad, Donetsk, Rivne – III quadrants; Zhytomyr, Ivano-Frankivsk, Chernihiv, Vinnytsia, Sumy – IV quadrants. The rating of Zaporizhzhya (from 15 to 10) and Kyiv (from 9 to 5) regions increased the most. Cherkasy and Lugansk regions also moved from the fourth quadrant to the third. At the same time, a number of regions worsened their positions, most notably the Zakarpatska region (from 4 to 12), as well as Poltava (from 11 to 15), Khmelnytsky (from 16 to 20) and Ternopil (from 19 to 24) regions. Changes in the positions of the regions in terms of purchasing online activity of the population from 2014 to 2018 clearly reflect the essence of macroeconomic and regional processes and socio-economic trends that have been taking place in Ukraine over the last five years. This allows to develop and implement certain institutional, organizational and investment measures to improve the situation.

Conclusions and suggestions for further research. E-commerce in the regions has great potential, and further development of the e-commerce market will be directed towards their evolution. Combining the power of online and offline business offices will give an impetus to the development of e-commerce in the regions and at the same time will allow customers to make online purchases more easily in such online stores without thinking about the provision of service, warranty service or return of goods.

Thus, a number of conclusions can be made. First, the e-commerce market has a significant volume compared to other ways of monetizing Internet projects and is developing at a very high rate, so beginner entrepreneurs have the opportunity to take their position in the market, not taking away customers from existing players, but taking appeared segments. Second, it is likely that by opening an e-commerce project, the entrepreneur will be able to get the necessary investment. Third, the wide range of products sold through the Network and the growth of sales in the regions allow the entrepreneur to choose the most relevant for themselves or for their existing projects in the direction of trade.

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