Methodological Aspects for Electronic Commerce Evaluation: In-case of Small Business

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Abstract- **This paper investigates the methodological aspects of evaluating electronic commerce (e-commerce) effectiveness within the context of small businesses. As digital platforms increasingly influence commercial activities, small enterprises face both opportunities and challenges in leveraging e-commerce for growth and competitiveness. The study proposes a structured evaluation framework that integrates quantitative and qualitative indicators, including website performance, digital customer engagement, transaction efficiency, and cost-benefit analysis. The methodology emphasizes a multi-dimensional approach that combines internal performance metrics with external market benchmarks, enabling small enterprises to make informed strategic decisions regarding their digital transformation. Empirical insights and case-based applications reinforce the relevance of the proposed framework. The results contribute to the academic discourse on digital economy evaluation and offer practical guidance for small business managers and policymakers seeking to optimize e-commerce strategies.**

Keywords: Community, C2C, B2B, B2C, G2C, G2G, effectiveness, B2A.

1. INTRODUCTION

Electronic commerce (e-commerce) has revolutionized how businesses operate, interact with customers, and deliver value. For small businesses, e-commerce offers avenues for market expansion, operational efficiency, and competitive positioning. However, assessing the actual impact of e-commerce initiatives remains a complex task, particularly in the case of small enterprises with limited resources and analytical capabilities. The objective of this study is to develop a methodological approach tailored for evaluating e-commerce performance and effectiveness specifically in small business settings.

The government acts as a guarantor, ensuring through the development of an appropriate legal framework the legality of transactions in the electronic commerce system.

The second group of elements of the e-commerce system that characterize the variety of organizational forms that can be used include: electronic store; electronic department store; electronic kiosk; electronic auction; electronic storefront; electronic store of settlements; electronic market of third countries; virtual community (<community); consulting firm; brokerage information office or a separate broker; research service providers.[1]

2. LITERATURE REVIEW

An electronic store is a kind of shop window providing a user-friendly interface, a web server offering goods or services for sale. The main criterion for the effectiveness or successful functioning of such a store is the real volume of satisfied demand for goods or services.

Issues of e-commerce performance indicators, e-business and e-commerce management were studied by Nazarova I. B., Dianova T. V [4], Manyika J. M., Roberts R. P., Sprague K.L. [5], Vershinina S.V. [6], Zueva O.N., Donskova L.A.[7], Schneider G. [8], Pankina T.V. G[9], illies L.E. [10], Tassabehji R. [11], Zappala S., Gray C.[12], Chaffey D.[13], Stolbov M. [14], Brynjolfsson E. [16], Kuznetsov A. [15;17] Luzin D.A. [18].

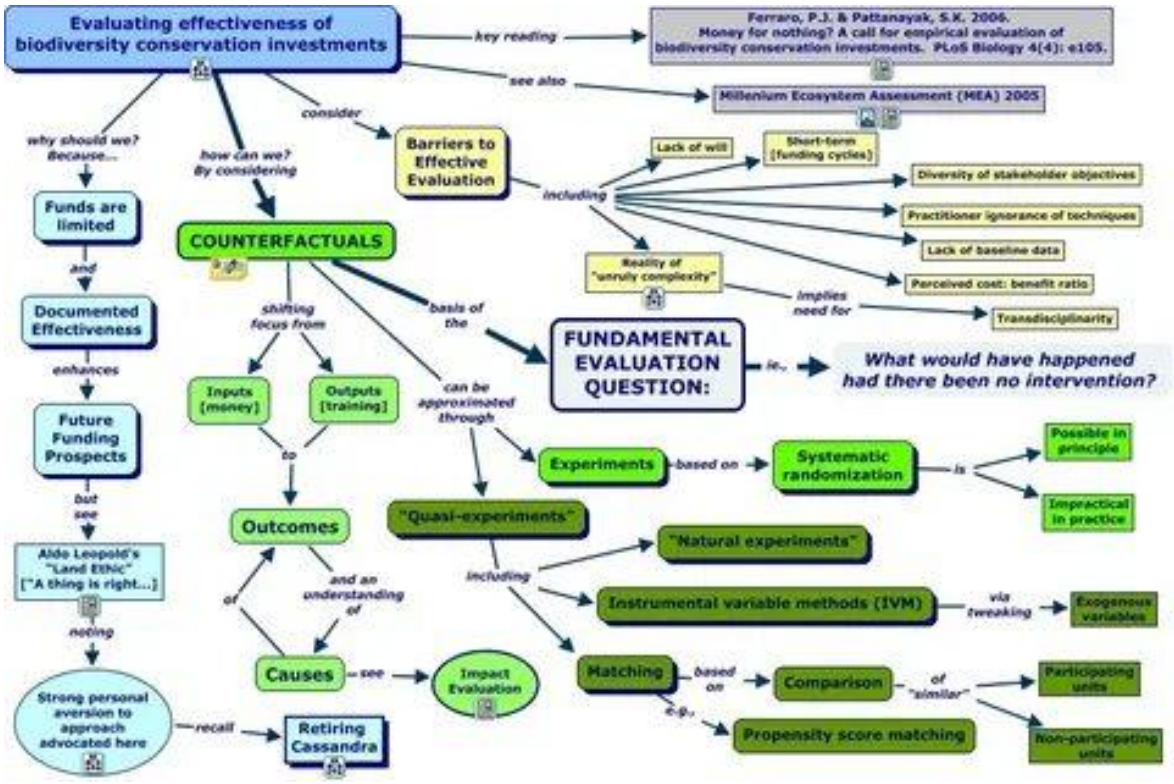
The evaluation of e-commerce has traditionally focused on large corporations, utilizing advanced analytics and integrated digital infrastructures. Studies by Laudon & Traver [19], and Turban et al. [20] highlight frameworks involving traffic analysis, conversion rates, customer lifetime value, and customer satisfaction indices. However, small businesses often lack access to such tools, and their e-commerce strategies tend to be more adaptive, and resource constrained. Recent research suggests the need for simplified yet robust methodologies that reflect the real-world conditions of small enterprises [21,22].

3. ANALYSIS AND RESULTS

Electronic department store - is an analogue of a conventional department store, in which various companies supply their goods. The main criterion for evaluating its effectiveness is a product brand (image).

An electronic kiosk (or interactive kiosk) is a hardware-software complex connected to the Internet and providing users with interactive access to information and other goods and services. A typical kiosk consists of a computer with a hard drive, a keyboard, a CD-ROM, a monitor with video and audio cards. Information can be entered by the user in various ways: from the keyboard, from the microphone, through a video camera, through magnetic card reader devices. A combination of these agents is also possible. The electronic kiosk allows you to fully work on the Internet: use search engines, directories and databases, simply call up the desired URLs, send and receive e-mail, and fill out on-screen forms.

According to research conducted by Frost Sullivan, the turnover of electronic kiosks in 1996 amounted to $ 369.7 million, according to the forecast it will reach $ 2.94 billion by 2003.



An electronic auction is an analogue of a classic auction but based on the use of modern Internet technologies. Any electronic auction refers mainly to the e-commerce model - “consumer-consumer” (Customer-To-Customer, or, in short, C2C). At the same time, the auction can also be represented by the business-to-business model. All kinds of energy electronic auctions and commodity exchanges can serve as an example of this model. They are more characteristic of the United States and Western Europe. Around the auction usually forms a community of people united by the same interests (for example, for certain books, for specific types of goods). The average transaction price at a Western auction is $ 35-80. In the Russian-speaking part of the Internet, there is an electronic auction Molotok.ru ("Molotok. Ru"), where you can sell or buy anything. Meanwhile, the management of the auction cannot give legal guarantees that the transaction will necessarily take place. This is due to two main reasons. Firstly, the lack of legislation on electronic signatures in Russia. Secondly, the low popularity of bank cards, which does not allow the use of a card number to identify a bidder (a bank card number is a mandatory attribute for participation in Western electronic auctions).

The specificity of the process inherent in an electronic auction implies the need to provide a multimedia interface, an Internet access channel. In this case, it is very important to show the goods face. An auction is a contest in which the seller wants to get the maximum price for his product, and the buyer hopes to buy the product at the lowest price.

They are divided into two large classes depending on the growth or decrease in rates. Bets can increase from minimum to maximum (winning) or, conversely, decrease from the originally set maximum to winning minimum.

Most suitable for auction trading are computers, new high-tech products for the market, discounted products, slow-moving products, recent leading products, and collection goods.

One of the important reasons for the emergence of electronic auctions is the ability to determine real market prices for goods.

Electronic varieties of auctions are distinguished from traditional auctions by several factors: a large number of buyers, many goods, direct interactive communication between sellers and buyers, various auction models, round-the-clock operation, lack of territorial boundaries, a detailed description and image of the goods, customer service.

An electronic storefront is specialized software designed for the formation and maintenance of server pages containing offers of goods and services.

Electronic billing shop - specialized software designed to integrate an electronic storefront with a specific payment system.

The electronic market of third countries - it is based on companies that provide software for the design of electronic stores, subsequent support, hosting (that is, placing a user's web page on some server connected to the Internet; usually this process is performed by intermediaries who provide a place on the site and establish a connection with the payment gateway).[2]

Virtual community (community) - a community of specialized electronic stores (Geosities, Amazon, Ozone). The main criterion for effectiveness is the association of buyers in groups of similar interests. The consequence of this is a reduction in advertising costs. The basis of such communities is ready-made societies: fan clubs, associations, etc.

A consulting firm is a company specializing in providing a range of consulting services in the design and management of electronic stores, conducting the necessary market research on the market, or recruiting offices dealing with staff recruitment.

Brokerage information office or a separate broker - their purpose is to provide the potential buyer with the amount of necessary information about the market.

Research Service Providers - Specialized

Organizations that carry out various types of research on the Internet and in e-commerce systems.

In the e-commerce system there are four main models of business organization:

1) business-to-business or company-company (Business-To-Business or B2B);
2) a business consumer or a consumer company (B2C);
3) business administration (Business-To-Administration or B2A);
4) Consumer-To-Administration C2A.

Recently, experts have recommended the consumer-consumer model (Consumer-To-Consumer or C2C).

The interconnectedness of the basic models of organizing an e-commerce system can be illustrated using Fig. 1.

The Business-To-Business (B2B) model is a sector focused on organizing practical work between companies in the process of manufacturing goods or services. This sector of electronic commerce, in addition to the sale by corporate customers of raw materials, semi-finished products, components for the production of goods or the provision of services, is also involved in the development and operation of special systems for the electronic collection and transmission of information that ensure the necessary integration of commerce partners.

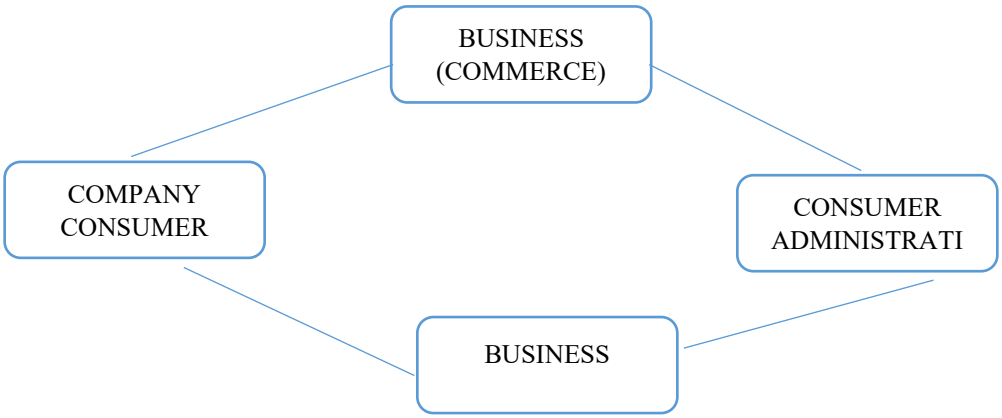


Fig. 1. The interconnectedness of the basic models of organizing an e-commerce system

In models such as business-to-business, a scheme of fully automated interaction of business processes of two firms (companies) that use the Network to order suppliers, receive bills and pay is implemented. With the help of gateways, an automatic connection of business processes with the Internet system (external environment) is provided.

Models of the type of business-to-business have the following distinctive features:

1. The presence of a gateway that provides automatic access to the Internet from a business system.
2. Direct integration of data input / output into the business process and from the business process of the firm (company).
3. The use of a single standard for transmitted messages -
4. EDI (Electronic Data Inter Exchange).
5. The equal nature of those participating in the electronic system commerce firms (there is no hierarchy like distributor-dealer, manufacturer-supplier).

The Business-To-Consumer (B2C) model characterizes a sector focused on companies working with individual consumers of goods or services. The difference between this model of commerce and traditional trade in catalogs with delivery is that the client can make purchases or receive services without leaving his home or office, using only a computer and electronic credit card. The implementation of this model opens up new opportunities for potential buyers. One of these features is customization. This is such an opportunity provided to the buyer, the essence of which is to independently design A of the future item of purchase. In particular, on the territory of the NIKEiD online store [http://vAvw.nike.com], customers are able to design the shoe option that suits them: choose the sole from a certain material, the color of the finish, and place any inscription up to 8 characters long. Moreover, the option created by the buyer can be immediately seen on the computer screen. [3]

Managers can communicate with the first company using an interface (for example, a browser). Managers can receive (for example, by e-mail or through a browser) the necessary information from the first company and then enter data into their management system and carry out their business process. Managers of the second company act as consumers of the first company. The features of the second model of e-commerce organization - business consumer - are as follows:

1. The seller (firm 1) does not trade using an automated trading system integrated with the Internet interface, but "manually" through his managers.
2. There is no full integration between the business process of the trading company and the external interface of the online store.

Through the Internet, you can successfully sell any goods or provide certain types of services. It has been established that the business-to-business market does not depend on the name and range of goods and services sold through the Internet. Meanwhile, for the consumer business market, there are such types of goods and services that do not bring sufficient economic benefits.

The third type of e-commerce model - business administration - includes all types of transactions between firms and government organizations. For example, in the United States, information regarding government planned purchases is published on the Internet. All companies can send their offers electronically. In addition to procurement announcements, administrative authorities may also offer the possibility of electronic exchange in operations such as, for example, a refund of value added tax. This model of organizing an e-commerce system is at the initial stage of development.

The fourth model for organizing the functioning of the e-commerce system - consumer-administration - is currently under development. Its implementation will expand electronic interaction in areas such as, for example, social security.

An additional model - Consumer-To-Consumer (C2C) - is a sector in which consumers communicate with each other, united by visiting one web site. It is believed that any electronic store can be attributed to this area of electronic commerce. A certain web site forms a certain community of people united by the same interests. An example of a stable community is electronic auctions. They become an excellent advertising platform on which the quantitative and qualitative composition of the audience is known in advance. Moreover, all visitors are usually divided into clear subgroups of "interests": someone more often attend car auctions, someone book. According to experts in the field of e-commerce, the effectiveness of advertising on sites that have united around themselves a certain and constant community of potential buyers is relatively higher.

The participation of the State (Government) in the process of electronification of commercial activity led to the emergence of new types of models: Business-To-Government (B2G), Government-To-Citizens (G2C) and Government-To-Government (G2G). Thanks to the implementation of the B2G model, costs are reduced, and taxpayers save on the maintenance and financing of the state apparatus. Thus, the Decree of December 17, 1999,

adopted by the US Federal Government, states: "Heads of departments should promote the use of e-commerce, where possible, for faster, cheaper provision of federal services with necessary goods and materials, which will lead to lower costs taxpayers. " The US government spends more than $ 225 billion annually on the purchase of necessary goods. Improving the openness and transparency of governing bodies, ensuring free access for citizens to all necessary state information in the United States is associated with the introduction of an e-commerce model of type C2C.

Several types of electronic commerce are distinguished in the economic literature, the main criterion of which is the target group of consumers [1]. An important factor in the organization of any trading activity, in particular electronic commerce, is the assessment of the effectiveness of decisions made and of the whole process. All electronic transactions take the form of long-known types of commerce, such as trade, insurance, and leasing. Accordingly, the methods of their assessment are studied in detail and applied in practice. It is necessary to determine the scope of the assessment, the objective function, identify the necessary indicators and formulate criteria that will indicate the degree of effectiveness. In electronic commerce, you can use the same system of business analysis, i.e. to collect and organize data, and on their basis to calculate performance indicators. If the methodology for evaluating the effectiveness of electronic commerce does not have clear differences from conventional types of commerce, then in the formation of cost items there are several features.

The methodology under consideration refers to the largest trading floors, where the second interaction scheme is used - from producer to consumer. The analysis of economic efficiency is based on the calculation of the main cost items and cost reduction using e-commerce systems. For analytical purposes, several main cost items should be distinguished:

1) depreciation.
2) rent for communication channels.
3) contributions for the domain name.
4) payment to the Internet service provider for the provision of space on its own server.
5) staff salaries.
6) additional costs in case third-party companies are involved in the development of the server, its design, and its functions.
7) the costs of ongoing advertising campaigns, etc. [2]

It can be concluded that using electronic communications, the cost of printed products is reduced, as well as the cost of renting shops and labor of managers in the sales area, the need for using classical distribution channels and consumer interaction disappears. Using electronic technology, savings and minimization of costs occur. The practice of electronic commerce has shown that in most cases, the high efficiency of electronic commerce is ensured by minimizing distribution costs. Nevertheless, the problem of assessing effectiveness is quite wide and may include technical, economic, organizational and other aspects. Setting goals, analyzing indicators and developing measures to increase consumer confidence are important criteria for conducting any commercial process, including electronics.

Currently, in economic literature there is a generalized division of the effects of the introduction of electronic commerce into economic, organizational and marketing; gradation of effects for buyers and sellers; There are a number of indicators of the effectiveness of electronic commerce and electronic commerce. There are studies on the factors in the development of electronic commerce and the economic consequences of its expansion, the "slip effect" with a logical reduction in transaction costs. However, a harmonious system of indicators that allows evaluating the effectiveness of electronic commerce as a specific type of economic activity at the level of an economic entity, country or economic union of countries is currently missing. Scientists Luzin D.A. and others generalized the economic effects of electronic commerce, but the main drawback of the proposed indicators is the lack of a method for calculating and testing real indicators. In addition, the proposed table of e-commerce performance indicators is chaotic, the risk and effect of e-commerce is not clearly distributed. Several indicators were missed, such as increment of profit from sales due to cost reduction, job loss (reduction), increase in the share of high-tech electronic products in the export structure of member countries, growth in global sales of illicit funds (drugs, smuggling, etc.)

Table 1: The economic effects of e-commerce

Economic effect	**Index**		
	From the position of the buyer	From a seller's perspective	From the position of the state
Micro-level (economic entity - consumer)			

Cost savings	1. Lower prices for goods 2. Lower consumption costs: -consumption of time; -moral costs (communication with boring traders); - transportation costs;	1. Decrease in capital investments 2. Cost reduction due to reduction of distribution costs: a) transaction costs: -transport costs (simplification of logistics schemes; reduction of transportation costs); - staff costs (staff release; labor productivity growth); -reducing rental costs; -content and maintenance of production assets; b) trade security costs -technological process: - costs for document management and payment services; - partial costs of customs clearance	
Turnover growth	1. The growth in consumption due to the expansion of choice ("global choice"); 2. The increase in purchasing power due to lower prices	1) Market expansion; 2) Increased sales intensity in existing and new markets; 3) Increase in profit due to increase in sales 4) Increase in profit from sales by reducing costs	
Increased risk loss	1. Not deliveries or late deliveries of goods; 2. Loss of funds due to online fraud; 3. Inconsistencies in the quality of the goods to the formed expectations;	1. Refusal from the purchased goods (services); 2. Poor delivery of tangible goods; 3. Non-receipt of payment from the client; 4. Deferral of payment due to technical malfunctions in banking operations	
	4. Financial losses due to cyber attacks on online stores and financial services providers; 5. Disclosure or abuse of personal and commercial information (spam advertising, etc., increased and operational awareness of competitors) 6. Latent e-commerce cartelization (rising prices, reducing price dispersion, increasing competition, squeezing space and time for competitors)		
Mezo level (country level)			
The growth of tax revenues to budgets of various levels			
GDP growth per capita			
Increase in labor productivity in the sphere of trade due to increase in the share of electronic commerce			

Increasing the purchasing power of the population by reducing the cost of acquiring goods			
Increased risk loss			Losses (reduction) of the workplace
			Tax losses from shadow and unaccounted operations
			Losses from fraudulent and unfair transactions (one-day firms, etc.)
			Sale of illegal funds (drugs, smuggling, etc.)
Macro level (level of international interactions)			
			The growth of international trade
			Improving the competitiveness of goods in the international market by reducing prices in electronic commerce
			Growth in the balance of foreign trade of countries participating in trade relations
			Expansion of the geography of foreign trade (growth in the number of counterparty countries)
			Growth in the share of high-tech electronic products in the export structure of member countries
			The growth of tax revenues in the budgets of countries participating in trade relations
			Growth in global sales of illicit drugs (drugs, smuggling, etc.)

Based on the proposed scheme of economic effects, the authors propose to form the following list of relative indicators of the effectiveness of electronic commerce at various levels of economic interactions:

1) Micro level:
   - The ratio of the number of actual purchases to the number of visitors to the online store
   - Changing the share of electronic commerce in all trading operations business entity (in kind and in value terms)
   - Changing the profitability of trading operations in electronic commerce compared with traditional forms of trade
   - Relative increase in labor productivity of employees of trading enterprises in electronic commerce compared to traditional trade
   - An increase in the share of distribution costs in the cost structure of the enterprise
   - Index of electronic prices (electronic prices / traditional prices)
2) Mesoscale:
   - Changing the structure (species and geographical) of the electronic consumer basket
   - An increment of the share of GDP of electronic commerce per capita
   - Annual per capita electronic purchase check

- The ratio of the average electronic purchase check for a period to the per capita income for the same period
- Index of electronic prices (electronic prices / traditional prices)
- Change in the dispersion of electronic prices (as an indicator of the level of cartelization of electronic commerce in the country)
- The ratio of tax revenue from e-commerce-to-e-commerce GDP.
- The average annual value of electronic purchases (as the product of the average check for the population of the country participating in electronic commerce)
- The ratio of e-commerce GDP to the average annual cost of electronic purchases
- The ratio of the number of complaints to the number of electronic commercial transactions

3) Macro level:
   - Change in electronic foreign trade.
   - Changing the balance of electronic foreign trade turnover of member countries.
   - GVP e-commerce per capita in countries participating in trade relations.
   - The ratio of the share of high-tech electronic goods to the share of all goods sold through electronic commerce.
   - The ratio of the average electronic purchase check for a period to the average per capita income for the same period (Percentage of electronic purchases in the average per capita income of the population).

4. CONCLUSIONS

Thus, the system of indicators developed by the authors allows us to evaluate the effectiveness of electronic commerce, to predict and evaluate the effects of various measures to improve the mechanism of electronic commerce at various levels of the economy, and, therefore, to identify and implement the most effective economic instruments for the development of this sphere.

Policymakers should support small businesses by offering digital literacy programs, subsidized access to analytical tools, and standardized e-commerce KPIs tailored for SMEs. For business owners, the proposed methodology can serve as a decision-making aid for evaluating investments in platforms such as Shopify, WooCommerce, or regional marketplaces.

Evaluating e-commerce effectiveness in small business settings requires a context-specific, scalable approach. The framework proposed in this paper integrates critical digital performance dimensions while accommodating the resource limitations of small enterprises. Future research may extend this model to cross-border e-commerce or integrate AI-driven predictive tools for better forecasting.

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