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IMPROVEMENTS IN ECONOMY DIGITIZATION QUALITY BASED ON INNOVATIVE TECHNOLOGIES IN E-COMMERCE

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Abstract

Recent developments in digitized economy have resulted in radical transformation both in production and technologies and in the employment structure and people's lives. The structure of consumption is also undergoing transformation with hi-tech products and information services taking an ever growing share and rapid growth of e-commerce. Research findings prove economy digitization to depend primarily on the level of its organizational structure, the scope and scale of functionality, its adaptation to the environment. Characteristic of modern digitized economy on the whole is its information and intelligence intensiveness with varying degrees across industries. The key factor guiding the philosophy of digitized economy is the process of converging traditional and e-commerce. For already existing and well-known brands e-commerce becomes an extra channel of business activity both for B2B (business-to-business) and B2C (business-to-customer). Developments in web-technologies result in establishing a global electronic financial market. The surveys conducted with the e-market target group allow forecasting that growth of e-commerce will generate a number of radically novel trends in establishing an up-to-date information infrastructure; its integration into global markets will stimulate minimization of overhead costs in the whole economy saving for allocating a significant share of economic resources for sustained economic growth.

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1. Introduction

Transition to digitized economy has made a huge impact on the conditions in which businesses operate and in their development they begin to set priorities on highly-efficient information technologies aimed at improving production management including analyzing the market, its needs and trends, providing for highly-competitive products, establishing radically different relations with suppliers, etc.

Digitization-based transformation at the level of organization structure stimulates transition from a typical IT service, whose main purpose is to provide for certain functionality, to the idea of open systems, which are predominantly customer-oriented while accounting for such factors which underlie the emergence and growth of new markets for goods and services with innovative and promising business models.

Under the definition by the World Bank digital economy is seen as a system of economic, social and cultural relations based on information and communication technologies. In this aspects digitization brings about significant changes in management institutions and business processes related to production, distribution, exchange and consumption of goods and services; it also contributes to gaining ever-increasing benefits of new technologies including the innovative tools for e-commerce.

Digital economy is a complex system and, affected by innovative technologies, it undergoes continuous dynamic impacts and evolves necessitating for new sustainable processes and conditions in the new environment.

To solve these problems businesses are to adapt their production structures to conditions resulting from economy digitization with advanced production processes quality management based on application of innovative technologies for e-commerce.

In this aspect the crucial role is to be played by e-commerce and its key component, e-trade, which will require development of models for customer behavior personalization on the Internet related to the company's communication and product range policies. Achievement of these purposes can be made possible exclusively by making intelligence and IT underlie the e-market and by providing for solutions in interaction with customers within the business processes being implemented.

Trends in e-commerce developments are to be analyzed jointly with the analysis of basic features of promotional campaigns and/or promotional strategies of online sellers. These basic features of web-stores promotional strategies are characterized by broad market coverage, insignificant differentiation of goods and/or services, low costs of searching for promotional information. Spending on advertizing and promotion constitutes an item of fixed costs which company will need to stay competitive.

The online trade is characterized by constantly increasing rivalry which, to a significant degree, is determined by market becoming saturated with consumer goods and services and which requires to develop new forms of retailing.

In highly-competitive environment an ever-decisive role is to be played by the company being able to establish itself in the market – an online seller has not only to gain a certain share in a particular market, they will have to struggle to secure their position by attracting new and retaining the seller's current customers. Put differently, competition is moving to a new stage in its development where web-stores compete not for visitors, but for buyers.

Evaluating the current tools applied in e-commerce we are to note its wide infrastructure which comprises communications, banks, web-stores, legal institutions, insurance providers etc. Digitization of economy bringing new online methods and technologies of customer interaction puts emphasis in producer-consumer chain on consumer wants (Shilov, 2019).

2. Problem Statement

Problems of digitization-based transformation of economy are largely determined by effective and efficient implementation of solutions for which the following are to be evaluated:

- 1) features of innovative processes implementation;
- 2) principal factors affecting competitiveness in e-commerce;
- 3) sustainability of e-commerce.

The problems and solutions to them are described below.

2.1. Features of innovative processes implementation

Digital economy being continuously affected by innovative processes of varying scale and quality of its functionality development is extensively influenced by information products and services. E-commerce and its core component – online trade – actively consume new information technologies and the effectiveness and efficiency of their implementing determine the industry's efficiency in general (Salminen et al., 2017).

A major role is being played by innovations in the field of human resources where they generate preconditions for increasing the significance of endogenous factors aimed at developing technologies in e-commerce.

2.2. Identifying principal factors affecting competitiveness in E-commerce

Within the area of online trade Russia is extensively developing B2C technologies for seller-buyer interaction. The quality of B2C interaction is determined directly on how efficiently, considering competitiveness factor, a company will be able to develop strategically correct and original concept for its virtual business.

Also, ever more immediate and urgent is the problem of entering the market and gaining advantage as compared to the competition in the market (Neligan, 2018). Competition in online retailing is becoming increasingly tough. And an ever more crucial role is being played by the task of forecasting e-trade growth indicators.

2.3. Evaluation of sustainability in e-commerce

A key factor of economic analysis in e-commerce is evaluation of Internet-projects economic sustainability. Such analysis is required for both new-born companies and for those long-established businesses which already effectively operate in the e-market. Here, an increasing significance is given to responsibility for managerial decision-making within the framework of e-market participants' interaction, with a special emphasis placed on providing high-quality decision-making.

The economic sustainability evaluation allows developing well-based approaches to strategic decision-making by companies with account of competitiveness factors along with area-specific pricing, sales volumes and production costs.

3. Research Questions

The study discusses the following issues.

What are technological innovations in digital economy?

What are the key factors of competition in e-commerce?

What is sustainability considering e-commerce?

4. Purpose of the Study

The purpose of the study is to investigate the mechanisms for improving the economy transformation quality by developing innovative technologies in e-commerce and its core component of online trade.

5. Research Methods

5.1. Investigating technological innovations in e-commerce

The world economy is being transformed by new information technologies and the character and the quality of socio-economic systems in developed countries is being changed, changes resulting from extensive acquisition of technological innovation (Ananyin et al., 2018). Transformation processes are being characterized as more active and more systemic becoming the main economic resource and the principle productive force.

Digital economy is characterized by ever more crucial role as growth catalyst of continuous innovation while improving and renovating productive potential. Technological innovations become drivers for growth and qualitative transformation of the country's GDP allowing for increased productivity and rendering decisive influence on the country's economic growth (Yastrebov & Yastrebov, 2018).

Digital economy is also characterized by high-level intelligence and informational capacity – these being signature of both individual industries and economy on the whole. Digital transformation notably implies most modern resource-saving technologies and innovations and underlying hi-tech which rely on the global network.

In the Internet-economy two interrelated processes can be identified, one of which is making informatization less costly, the other is making information transfer and sharing cheaper. Information technologies affect all aspects of economic activity and the complex of optimization, control and execution functions (Nissen et al., 2018).

Digital economy stimulates fast development of technological innovations aimed at providing sustainable development of human resources. It allows establishing various forms of accumulating intangibles as well as innovative information technologies including e-commerce which has recently transformed into an integral part of the world economy.

Applying innovative technologies in e-commerce radically transforms the functions of logistics, the latter becoming one of principal factors in gaining competitive advantage by a product. Competitive advantage of the whole business is determined to a considerable degree by its ability to quickly react to changing consumer demands and post-sale consumer servicing. This implies – for e-commerce – development of an absolutely different and innovative management and criteria for performance evaluation, which, in its turn, will eventually result in a qualitatively new company brand.

The philosophy of digital economy is largely determined by convergence of traditional and e-commerce. When applied to already established businesses e-trade allows creating an extra channel of distribution for both B2B and B2C (Arenkov et al., 2019). Development of web-technologies lays foundations for the global electronic financial market.

One of continuously developing areas of e-business today is B2C which is deemed a highly promising opportunity for new-born companies since online trade is characterized by lowest threshold values of market entry. For such companies success in commercial activity largely depends on well-based strategic development plan, of development of online shopping option, in particular.

In the current conditions the primary task is development of innovative, progressive, strategy-based activities in Internet-trade which include:

- merger of online shops into holdings which will allow minimizing overhead costs and will improve the level of business organization;
- wider product ranges, improved content related to product features, specifications etc. and efficient pricing policies (Bressanelli et al., 2018);
- continuous improvement of customer servicing including development and improvement of delivery service.

Here, a crucial role is to be played by all-inclusive study of the specific features of e-market and its target groups, ability to determine opportunities for growth in online trade as well as ability to quickly react to changes in the market through extensive and effective application of marketing tools.

5.2. Investigating major competitiveness factors in online trade

Currently the majority of businesses are planning for their entry into e-markets based on presupposition that traditional models of goods and/or services distribution are far less efficient than Internet-trade (Plaksin et al., 2017). Not all of the e-markets, however, can be characterized by positive dynamics as compared to physical markets as recent applied studies indicate. Securing sustainable competitive advantage in such markets will require companies to continuously analyze a number of aspects (financial, legal, organizational, and communicational) related to developing a complex integration of measures, actions and activities.

When selling online, sellers and stores can establish lower prices for their products and/or services by minimizing businesses' costs of searching, analyzing and processing of the necessary data. Principal factors which contribute to e-market efficiency are perfect competition, saturation of target groups in relation to promotion and information, savings on rental costs, simplified settlement and payment procedures. When considered in terms of economic theory, the factors which determine the e-market

efficiency can be identified as the following: level of costs, price dispersion, and high price-elasticity of demand. It can be argued that the latter for the market discussed is higher in comparison with traditional models of distribution and hence the costs will be lower. The studies conducted and the analysis of current markets, however, indicate that the rates of price variations appear in fact to be much higher in e-markets.

The economic theory suggests that price dispersion in such markets is to be much lower than in traditional markets, while none of the studies conducted indicates the presence of such condition. The principal components underlying high degrees of online price variability are the following:

1. Heterogeneous goods and/or services. Different features and qualities, saturation with information, wider functionality, packaging, etc. which can vary significantly with sellers of the same categories of goods and/or services.

2. Disproportionate promotional and informational saturation. Core target groups can be either well or less informed on the seller pricing policies in relation to certain goods and/or services, the factor dependent on the quality of providing the promotional and informational service. The buyers who are most informed enjoy buying at lowest prices and vice versa. It is this factor which allows e-sellers with the maximum promotional and informational saturation and lowest prices to secure considerable market shares.

3. Brand loyalty. Brand is defined as a core element which allows target audiences identifying certain goods and/or services among similar goods and/or services in the market (Cherenkov & Vereteno, 2019). It is worth mentioning that both sellers and target audiences in e-markets are differentiated in terms of various features, time and/or distance, for instance, and here it is the brand loyalty that is to play a decisive role (Molchanov & Golovnev, 2016).

4. Price discrimination strategy. In e-commerce price discrimination can be said to play a more significant role than in traditional models of distribution which is determined by the following factors: feedback to sellers from the target audience, this allowing both parties to timely collect and analyze information about each other; cost minimization, this allowing sellers to adjust prices quickly reacting to both internal and external to the market factors; heterogeneous buyers, this allowing sellers segmentation of buyers into the core and peripheral target groups.

To maintain the equilibrium in a given e-market market participants can establish positive conditions. Suppose target audience reacted positively to adjustments in prices by a given e-seller (Davyy et al., 2018). This fact was immediately communicated to primary and secondary competition in the market and they reacted with retaliatory measures (lowering prices for certain products and/or services). Such measures will deprive the first-to-lower-prices e-seller an opportunity to benefit considerably from price variation.

Competition between e-market participants is primarily distributed within market groups with two constituent groups to be identified (Gulieva & Chunikhina, 2019). First group of e-market participants position themselves as primary competition with higher market shares and start with competing with each other. Second group of e-market participants regard themselves secondary competition – they set priorities to prices established by the first group and compete within the group of secondary competition. Such groups tend to establish implicit price collusions and their actions have very insignificant influence on the pricing policies of the first group.

The recent overall trend in the market of advertizing and promotion services can be characterized as the advent of Internet-advertising. Another noticeable trend in this market is constantly and rapidly increasing numbers of Internet-users. Development of new online platforms, increased numbers of social networking result in emergence of innovative and/or improved advertizing methods and media which, in competition with each other, widen the market of advertizing and raise it to a new level (Rudakova & Molchanova, 2020).

At present development of advertizing and information technologies in e-markets requires from companies to apply innovations for timely analysis. Efficiency indicators developed for digital environment (number of demonstrations, targeting, clicking rates, tracking, CR, CTR, CTI, CTB< frequency, median time elapsing between demonstration and clicking, etc.) are evidently important, however, attention should be also paid to such tools for analysis as Leads, CPC, CPA and ROAS. Accuracy in organizational decision-making by online stores management is directly dependent on operative and/or wave analysis of their advertizing campaigns.

5.3. Investigating economic sustainability of e-trade

Objectively, financial capacity is determined by both modern structure standards in certain sector of economy, and by hi-tech industry structure.

Currently, what the sellers can offer and what the customers demand in multi-product and multi-service markets depend largely on every stage of product or service life-cycle, and their economic analysis allows identifying that some of them depend strongly and immediately on improving the methods of selling and distribution based on application of modern technological developments. It has an enormous impact, for instance, on investment and production stages.

The content of the above stages and their ability to affect the forecast competitiveness rates, the variability of their implementation requires specific methodologies and approaches for investigating and examining the results of which will allow for more accurate managerial decision-making based on innovative information technologies, e.g. distant business projects via the Internet (Tambovtsev, 2017).

Financial assessment and expertise related to e-commerce components are characterized as highly problematic given current economic conditions, but solutions seem to root in objective assessment of invulnerability, i.e. feasibility and sustainability of projects implemented in virtual markets. This fact has many implications for both financially independent and for promising new participants in information technologies market.

Financial expertise and assessment of business activities in information markets allows both evaluating the competitive advantage of a participant, analyzing and specifying major factors of influence, determining those most prospective and feasible and prioritizing in terms of sources of funding (Taranukha, 2017). The data obtained are to be used for identifying the objective items and for determining the content of strategic marketing planning which will determine managerial decision-making.

Methods and techniques of financial expertise and assessment simplify finding best solutions for quickly changing information technologies market (Vasin & Kursky, 2019). They account for the existing methods of pricing to determine the required levels of markup, discount and price adjustment differentiation in terms of continuous changes in modern markets for certain product or service ranges given the company's

capacities, partner relations and results of marketing studies conducted to identify the market's needs, competition and consumer purchasing power.

Pricing policy allows manipulations with the sales volumes and costs components in terms of both increasing and decreasing these. Such marketing activities and measures are focused primarily on securing sustainable profitability in market conditions, which sometimes requires lowering profits for further increasing the entity's levels of profitability in information market.

By applying the techniques of economic analysis the company can determine the fixed levels of sales volumes for particular range of products, resources used for it and market-based pricing variability for providing marginal break-even business activity (Gryazev et al., 2019). Quickly changing and highly competitive environment of Internet-trade regards as more reliable not calculations of break-even point, but determining the area of financial sustainability the parameters of which can secure positive efficiency rates. This area is characterized by varying levels of profitability allowing to achieve possible volumes of sales for specific product ranges under which certain costs values result in even adjustments of revenues and expenses on selling.

Market-based approach implies constant monitoring of the rates with which the volumes of revenues and costs and expenses are changing within the area identified. The company is to develop a strategy for selling in certain volumes and for certain product range, for reducing or increasing the sales volumes of a given range, even for ceasing selling certain product(s) altogether in case the marginal costs in this area exceed the marginal revenues given even changes in expenses for selling the product(s) online.

Modern investment strategies in information markets allows flexibility in reacting to changing market environment, company's limited capacities and multi-vector consumer demands (Shirokova et al., 2017). This results in the necessity for operative adjustments in strategic planning for sales to achieve the point of equilibrium.

Most often such changes are possible in long-term planning of a business firm's activities in e-market. In the short-term adjustments for correction of deviations from the point of equilibrium need to be made quickly based on the results of express assessment which also provides for possible negative outcomes to be corrected further (Chattergy & Novak, 2017).

Existing developments in information technologies allow forecasting growing volumes of online trade. Evidently, for achieving the forecast efficiency a company is to apply innovative approaches in e-commerce.

6. Findings

The studies conducted demonstrate that for the national economic development to be intensified significantly a high-quality digital transformation of economy is required, which, in its turn, will require development of innovative technologies in e-commerce and is characterized by a combination of such features as:

- Flexibility in responding to emerging changes in both world and national economies which reflects the potential of the economic system for sustainable development and high level of

efficiency under external influences by applying certain compensatory measures and for maintaining the required selection of types of information;

- Generation, stimulated growth and dissemination across industries of new types of information and information technologies, positive factors for information infrastructure growths able to render positive influence on the quality of economic system operation and aimed at both extensive implementation of innovations and at generating highly efficient managerial components to secure sustainable growth of profits.

Digital transformation of the economy also implies transformation of consumption patterns and composition which is characterized to a large extent by increasing numbers of various services in the field of informatization and decreasing share of traditional products and services and this, in its turn, results in transformations of the people's ways of living and employment structure. In addition, digitized economy induces more effective adaptation to new qualities of demand with growing share of hi-tech products, information services and online trade. In other words, it means emergence of a new production and economic area based on innovative Internet technologies.

A characteristic feature of modern economy is the increasing degrees of informatization across industries in national economy. E-commerce provides transformations in functioning and role of logistics – it becomes a leading factor to determine the product competitiveness. In such situation the competences of companies in the area of supplies are also being transformed – from being a secondary function they grow into a primary one.

Reasonable spending for analysis and obtaining information on processes for products and/or services, limited numbers of sellers in online markets, interactive operations, targeting and the like – all these components of e-market can create conditions for price collusions in online shopping. This can partially account for the negative trends in online prices dynamics.

The above data lead to a conclusion that factors of competition in e-commerce acquire various forms and are characterized by high-degree variability. Also, quite obvious is the trend towards increasing spending on development of promotion and advertizing strategy and establishing positive relations to and public image of web-stores, and requirements of increased advertizing campaign efficiency are assigned top priority.

Studies of the e-market target audiences allow the following forecast: developments in e-commerce will generate a new and radically different information infrastructure which, integrated into global markets, will induce significant optimization of overhead expenses in the economy and allocation of the resources thus saved to achieve high rates of economic growth.

7. Conclusion

Digital transformation of the economy changes the environment in which business enterprises operate and their innovative development to ever larger degrees depends on their ability to apply efficient information technologies related to improving production management including analysis of market demands, provision of competitive advantages for the products, establishment of novel relations with suppliers, etc.

Improved quality of digital transformation at the level of organization induces transition from a typical informatization service, the main purpose of which is to maintain certain functionality, towards open systems which are customer-oriented, in the first place, and include factors relevant for establishing new markets of products and services on the basis of innovative and promising business models.

Digitization of economy generates radical changes in management institutions and business processes related to production, distribution, exchange and consumption of goods and services. It also promotes extensive benefits caused by new technologies development including innovative tools in e-commerce.

Finding solutions to the above tasks is extremely important and for this purpose businesses will have to adapt their production structures to new conditions of digital economy. Another requirement is that they have to apply the most advanced methods in production processes control and management based on innovative technologies in e-commerce.

Modern information market poses certain demands to objectivity in and responsibility for managerial decision-making which are dependent on complex intra-system market relations in conditions of toughening competition and on the necessity of mutual partnership given risk factors affecting competitive advantage of real projects implemented in the virtual environment.

In modern information market, the criterion for evaluation of decisions taken is profitability of business enterprises. Factor analysis of this efficiency indicator allows identifying key elements which regulate the desired outcomes. Most often they include sales volumes for different items, pricing policy, project costs.

Digital transformation is based on modern information technologies, innovations and the global computer network.

Here, e-commerce, and its core element e-trade, is to play a crucial role, which will require setting a top-priority of improving the online-buyer behavioral model. These purposes can be achieved only if the e-market can be made more intelligence-intensive and interaction with customers within the business processes realized can be established.

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