Market adaptation mechanism development of business models in digital economy conditions

Yulia Medvedeva[1*], *Maria* Kolgan[1], *Tatyana* Simonyan[1], and *Svetlana* Tsvetcova[1]

[1]Don State Technical University, pl. Gagarina, 1, Rostov-on-Don, 344010, Russia

Abstract. The article considers approaches to the concept of business model of business activity, considers its modern content in the context of taking into account the peculiarities and using the advantages of the digital economy. An analytical review of business models currently used by domestic and foreign companies with the allocation of e-commerce and innovation models is made. It is proven that the improvement of existing business models or the creation of new ones should be carried out through the re-engineering of their business processes. The classification of business processes according to various classification features which can be used in the process of reengineering, is given. Reengineering as a method of radical redesign of the company's business model, taking into account the main trends in the development of modern economy and the signals of key stakeholders is characterized in detail. Based on the results of the research, a conceptual model of hybrid reengineering for market adaptation of business models of Russian enterprises to the conditions of market economy is developed. Promising directions of its improvement were identified for all the main structural elements forming its integrity and synergetic character.

1 Introduction

In conditions of high dynamics of external environmental factors, which is manifested in the complication of the geopolitical situation in the country, the development of inflationary processes leading to the deterioration of the financial situation of enterprises and the decline in real incomes of the majority of the population, the need to implement the import substitution policy as a result of sanctions imposed by a number of foreign countries, the growing number of bankruptcies of business entities, the need to develop and implement adaptation mechanisms used by Russian companies is sharply increasing. At the same time, such mechanisms should be formed taking into account the trends of the modern digital economy, leading to the restructuring of business processes of the majority of Russian companies.

According to their conceptual content, the mechanisms of market adaptation in the current situation should include at least the development of the following interrelated issues: the formation of e-business models and their main components, as well as the creation of a new, improved system of relations with the main categories of consumers, key

* Corresponding author: jjmedvet@yandex.ru

partners along the entire consumer value chain in its updated, innovative version. In other words, it is necessary to first develop a conceptual model of digital transformation of business processes of the company itself, and then "bring" it to the external environment through the use of appropriate adaptation mechanisms.

Studies in these areas are not yet comprehensive, reflecting fragmentarily their individual elements, which is largely due to the novelty of the problem under study and the non-standard nature of its formulation for the domestic economy.

In this regard, this article attempts to systematize business models of Russian business, build a conceptual model of their implementation for the company and justify the mechanism of adaptation to the components of the external environment in the form of the main stakeholders involved in the creation and implementation of the value chain characteristic of a particular business entity.

2 Materials and Methods

In order to conduct a comprehensive, systematic study of the problem considered in this article, let us first of all define the essence of the concept of "business model". The study has shown that there is no single interpretation of this term at present, domestic authors provide a variety of its definitions [1, 2, 3] (Figure 1).

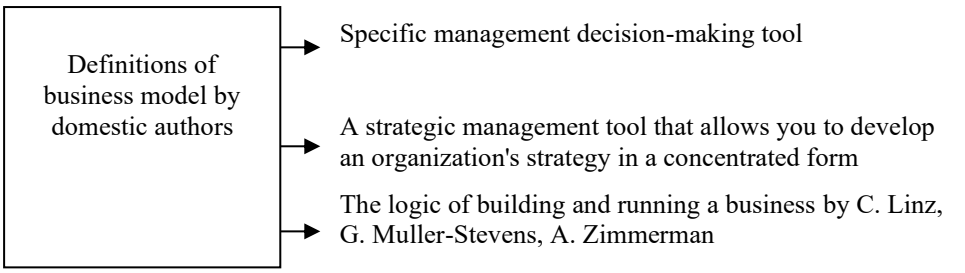


Fig. 1. Approaches to business model definition

Common in all definitions of the business model is that it characterizes the way of creating additional value used by the organization, a set of methods by which the company receives income from its business. The diversity of approaches to understanding the essence of the business model is the result of the realization of a number of evolutionary stages to its definition: financial and economic, operational, strategic, integrating, structural and systemic.

The financial and economic approach is based on identifying sustainable cash flows for enterprises. The operational approach focuses on the internal business processes and resources of the organization, and the strategic approach focuses on identifying its competitive advantages. When using the structural approach, first of all, the key subsystems of a certain business are considered, and the systemic approach - the relationship of the business entity with the environment. The integrating approach combines all the previous options and is based on the system of complex characteristics of the business model.

The current stage of conceptual understanding of the business model is related to the use of digital resources that bring additional profit to companies and increase their competitiveness. It is about the widespread implementation of Industry 4.0 technologies, the main ones being Big Data, blockchain technologies, robotics and sensorics, industrial internet, wireless communication technologies, neurotechnology and artificial intelligence, virtual and augmented reality technologies [4].

The complexity of the problem under consideration is that to date there is no classification of Russian business models of doing business both in general and within individual industries, spheres and sectors of the national economy. The traditional version, where business models are presented by G. Chasbro [5], A. Osterwalder and Piña [6], Ojasalo K., & Ojasalo J. [7], Pfeiffer A. [8]. These authors, widely known in the scientific community, used various classification attributes: scope of application; mode of transferring use value; interacting parties and the purpose of their activities; cause of emergence and market behavior.

The most elaborated and currently used are e-commerce business models and business models of innovation. For example, the following classification of e-commerce business models is proposed.

1. B2B (business-to business).
2. B2C (business clients).
3. C2C (consumer customer).
4. C2B (consumer business).
5. Model B2G (used by the government for trade and information exchange with various organizations).
6. Model G2B (government business used to organize government procurement).
7. Model G2C (is used to approach citizens as a whole to reduce the time costs associated with responding to citizens' request for various public services).

Recognizing in general the innovativeness of the proposed approach, we note that e-commerce, considered as a set of commercial transactions made on the Internet, is not an exhaustive business characteristic of any organization.

Modern scientific literature has not yet developed a universally accepted definition of such a concept as "business process", and approaches to its interpretation differ depending on the type of activity or a generalized definition of this category is given without reference to a particular area of business activity. In the works of Mohapatra Sanjay and co-authors there is a detailed analysis of the main definitions of the category "business process", which allows us to consider it in different aspects, but still we can trace a relative unity in its interpretation as a set of interrelated processes within different types of activities of the company, using different resources in order to obtain the final result at the output, represented in the form of products or services to meet the final consumption [8, 9]. It is characteristic that in a modern enterprise there are about twenty key business processes, and their total number can reach several hundred, creating a real basis for different business models. The study of various publications on the issues considered in this article allowed us to identify the following types of processes depending on the classification attributes used (Table 1).

Table 1. Types of business processes depending on different classification attributes

Classification features	Business process types
1	2
1. Functional role in the enterprise	1.1 Main business processes 1.2 Supporting business processes 1.3 Business processes of management
2. Customer focus	2.1 Customer-oriented business processes 2.2 Customer support-oriented business processes 2.3 Customer management-oriented business processes
3. Place in the value chain	3.1 Inbound logistics business processes 3.2 Production processes 3.3 Outbound logistics business processes 3.4 Marketing and sales business processes

	3.5 Business processes to support customer value 3.6 HR management business processes 3.7 Business processes of the organization's infrastructure 3.8 Business processes of technological development
4. Repeatability	4.1 Recurring business processes 4.2 Recurring business processes 4.3 Businesses-processes of one-time execution
5. By role	5.1 Structural 5.2 Functional

In addition to the classification criteria presented in Table 1, the following criteria are also used to distinguish business processes: by the direction of movement of business processes (horizontal, vertical); by the level of detail (cross-functional business processes, detailed business processes, elementary business processes); by the nature of interaction on the success of the organization (key business processes, critical business processes, local business processes); within the main elements of the balanced scorecard (financial, customer, production, development); by the nature of the organization's success (key business processes, critical business processes, local business processes).

Business models of innovation are widely represented in economic research and include, as a rule, the following components [10, 11, 12]:

1. Launching completely new products or providing new services, as well as creating new industries.
2. Differentiate the organization's new business model from other companies' options in a number of ways.
3. Conceptual business thinking, which is positively reflected in the growth of the company's economic performance and its competitive advantages.
4. Multiple opt-ins and conversions based on building creative value propositions.

It is quite obvious that business models of innovation are the basis of the company's market success, are the basic logic for changing their business processes, are the drivers of corporate change at present, and occupy a leading position in the development strategy of modern enterprises.

The analytical research conducted to achieve the purpose of this article has revealed low publication activity on the problem of mechanisms of market adaptation of business models of Russian enterprises in the digital economy. Among the available publications we can single out the article of the author's team consisting of Kuznetsova N.A., Pukach T.A., and Pukach A.M. [13]. In this article, the authors compared different approaches to the possibilities of adapting business models to the changing environment and proposed an author's approach to the consideration of industry specifics in the context of choosing a business model by a modern company. The main factor that contributes to the successful adaptation of business models of enterprises is their industry linkage and adjustment to innovations. In this regard, the authors appeal to the startup method and a set of templates that require only certain adjustments to specific conditions. The use of such an approach presupposes a navigator, whose main purpose is the individual reconstruction of such patterns.

In our opinion, the basis for market adaptation of business models of Russian enterprises in the digital economy should be, in our opinion, reengineering of their business processes. This statement is due to the very intrinsic nature of reengineering. Reengineering is one of the ways of making changes in organizations in order to increase and improve the efficiency of their activities along with reforming, reorganizing, restructuring and improving [14].

Initially, in Russian practice, reengineering was considered exclusively as a tool to stabilize business before the onset of crisis phenomena. In foreign practice, reengineering is considered as a fundamental redesign of the company's business model, taking into account the key trends in the development of digital technologies and signals from various stakeholders on the need to update the format of communications. However, in recent years there has been a rather noticeable convergence of Russian and foreign authors' points of view regarding the emergence and use of digital reengineering in Russia. The most notable in this regard is the research of authors Kazakova O.D., Azarenko N.Yu. and Lysenko A.N., where the authors consider digital reengineering as a special actualization of the company's business model taking into account the achievements of Industry 4.0 [15]. The authors have developed a method of digital reengineering of business processes, which includes the following components:

- development of a virtual map of business processes;
- calculation of quantitative values of business process quality metrics;
- development of forecast of business process execution anomalies;
- conducting business process reconstruction in automatic mode using adequate machine learning models.

In the process of formation of the digital economy in Russia, various models of business reengineering were formed.

1. Investing in strategic digital re-engineering projects aimed at shaping autonomous digital landscapes with a defined set of business partners.

2. Innovators are innovatively active business structures in Russia from the IT or fintech sector that create a fundamentally new product without a corresponding attachment to a specific parent company.

3. Efficient solution hunters are traditional companies seeking to narrow the competitive gap with leaders in both domestic and foreign markets, for which they use headhunting to attract third-party intellectual capital.

4. The blockbuster model of digital reengineering is a traditional physical business that makes extensive use of the benchmarking method to identify critical, vulnerable points of the company's business and directs all efforts to bridge the identified gap through reengineering methods.

Thus, we can conclude that in modern conditions the growth of competitiveness of Russian enterprises is impossible without digital transformation of their business, which involves significant changes in both their internal and external environment and encompasses interaction with all stakeholders, i.e. stakeholders [16, 17].

Under these conditions, the business models of those enterprises that have not yet started the digitalization process are subject to radical modernization for various reasons: due to the lack of necessary financial resources; conservative thinking of managers; and staff resistance to radical changes in their business activities. Those companies that already use digital models in their activities also need to improve them due to the toughening competition in the digital environment of business entities and the emergence of new technological achievements of Industry 4.0. In both cases, in our opinion, the comprehensive adaptation of enterprises to the parameters of the digital economy should start with the fundamental modernization or improvement of their business processes. This can be achieved through the re-engineering of business processes, carried out sequentially on the basis of a conceptual model of relevant content, the practical implementation of which will allow the formation of digital business models of companies. This process has already been partially initiated by the leaders of the domestic digital market in the form of development and use of such digital business models as: Maas platforms, technology hubs, distributed factories, on-demand production, experimental crowdsourcing, factory

upgrades, open business, customization, and data monetization. New models can be formed depending on the results of the reengineering of the company's business processes.

3 Results

Based on the research conducted, it was revealed that the most effective and corresponding to the modern aspects of market environment development, the mechanism of market adaptation of business models of Russian enterprises to the conditions of the digital economy can be the re-engineering of their business processes. In order to carry out systematic, purposeful work in this direction, a conceptual model is proposed, the stages of which are presented in Fig. 2. At the same time, the reengineering used can be considered hybrid, as it includes both traditional components and a digital component.

At the same time, despite the fact that in recent years there has been a sharp increase in the number of scientific studies that focus on various aspects of digitalization (technical, economic, social), the issue related to the impact of the digital economy on the transformation of business models of enterprises is still under-researched.

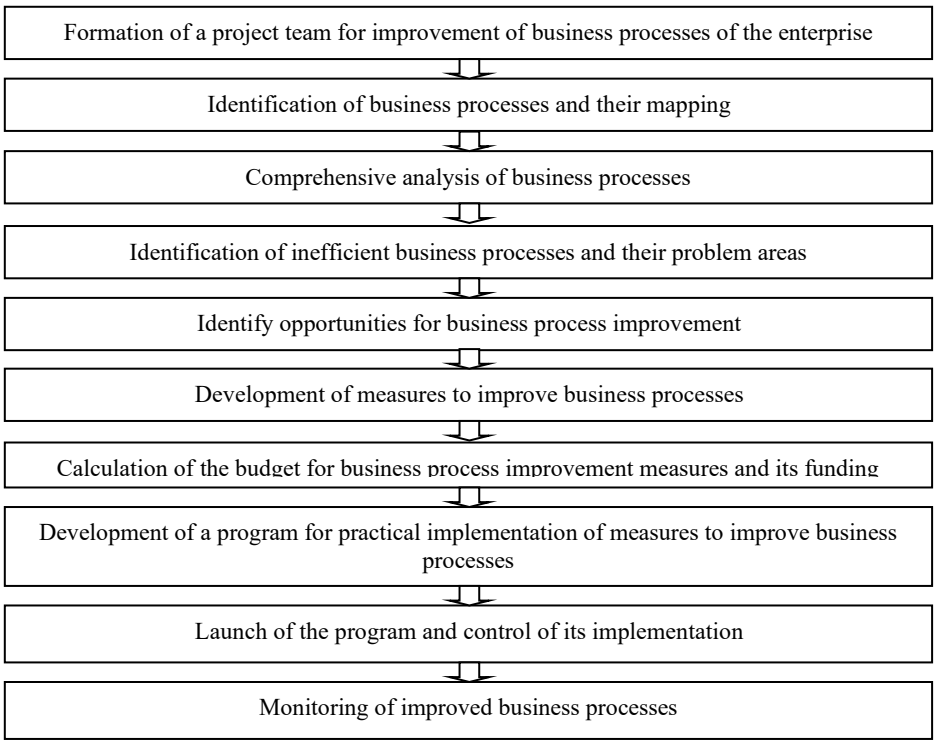


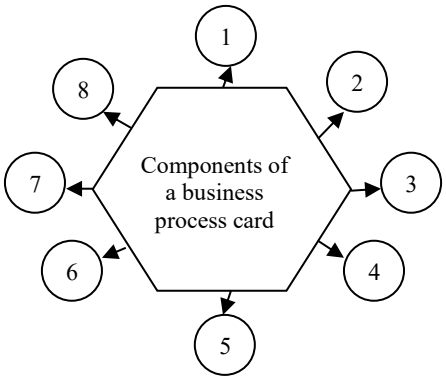
Fig. 2. Conceptual model of hybrid reengineering for market adaptation of business models of Russian enterprises to the conditions of digital economy

Let us characterize each of the stages of the proposed conceptual model.

The project team for using re-engineering to carry out market adaptation of Russian enterprises' business models to the conditions of the digital economy should be cross-functional. This is due to the fact that further analysis of the enterprise's business processes should be comprehensive and take into account the opinions of all specialists: technologists, marketing specialists, digital managers, economists, psychologists, lawyers, business

analysts, and top managers. It is also possible to involve third-party specialists, for example, on the issues of foreign economic activity of enterprises, taking into account its specifics in the conditions of sanctions restrictions and the implementation of import substitution programs.

Many enterprises do not carry out systematic work on the allocation of business processes and their identification. Therefore, first of all, it is necessary to do this work, to make a card for each business process, the main components of which are (Figure 3).



1 - process owner; 2 - process outputs and consumers; 3 - process inputs and suppliers; 4 - process objectives and indicators; 5 - process execution technology; 6 - process resources; 7 - process risks; 8 - process graphical chart

Fig. 3. Components of a business process card

Business process analysis is a set of methods and procedures used to obtain relevant information about their current state, identify strengths, weaknesses and bottlenecks. Such analysis helps to determine how effectively a process is working and what needs to be improved to increase its efficiency.

There are qualitative and quantitative analysis of a business process.

In the qualitative analysis process, its research is conducted:

- judgmental;
- graphing;
- in relation to regulatory requirements.

In the process of conducting quantitative analysis, various business process performance measures are calculated; analyzing product performance; analyzing customer satisfaction of the business process; and benchmarking the business process. For such analysis are used: SWOT-analysis, ABC-analysis, XYZ-analysis, the construction of the BCG matrix and the McKinsey matrix is carried out.

Problem areas of the businesses' business processes that may have led to their low efficiency or unprofitability may include:

- improper distribution of tasks among employees;
- low labor productivity;
- customer complaints;
- low level of marketing activities;
- low level of innovation activity;

- weak material and technical base.

Development of measures to improve business processes can be carried out by the project team with the involvement of the necessary specialists of the enterprise, or an outsourcing scheme can be used.

Budget is calculated for all activities and the source of financing is justified. In addition to own funds (net profit, amortization), bank loans, leasing, franchising, venture funds and various types of government support can be used. If a lack of financial resources is identified, the proposed activities can be ranked by applying ABC-analysis.

The program for practical implementation of the proposed measures should specify those responsible for their implementation, sources of funding and deadlines. In the process of performing the entire cycle of work to improve business processes, software packages shall be used, the selection of which shall be based on the following criteria:

- methodology breadth;
- technological capabilities;
- functionality;
- communicativeness;
- value.

The most common at present are such business modeling software products as: Business Studio, ARIS, AllFusion Process Modeier (BPWIN), Business Engineer, Microsoft Visio.

4 Discussion

The conducted research has shown that most of the issues included in the problem field of developing the mechanism of market adaptation of business models of Russian enterprises in the digital economy are of a debatable nature. This is due to the fact that each of its researchers forms its theoretical and methodological base depending on the results of certain empirical studies and the study of existing scientific developments. At the same time, there are studies that are extremely fragmentary and should be further developed:

- compiling a list and characterizing the content of already existing business models of Russian enterprises in certain industries, sectors and areas of the national economy;
- development of normative requirements for the procedure of reengineering of various types of business processes;
- development of the "digital re-engineering" standard;
- expanding the capabilities of software products used in the process of business process modeling;
- improving the system of financing business process reengineering in crisis industries of the Russian economy, including selective state support funds;
- development of a methodology for assessing the economic efficiency of business process reengineering, taking into account the peculiarities of the digital economy.

The solution of these issues will improve the efficiency of formation of new and functioning of traditional business models of Russian enterprises in the context of taking into account the peculiarities of the digital economy.

5 Conclusions

The key factor in increasing the level of competitiveness of Russian companies in the domestic and foreign markets are the business models they use as a way to create additional value along the entire value chain.

At present, the national economy of Russia lacks systematic studies of business models of enterprises, the process of their analysis and improvement in conditions of high

dynamics of external and internal environmental factors, as well as new trends in economic development, in particular, digital transformation of all aspects of the activities of market participants.

To solve this problem, in our opinion, it is advisable to use hybrid reengineering, which is carried out within the framework of the proposed conceptual model by implementing a number of interrelated stages, the ultimate goal of which is to improve the operation efficiency of Russian enterprises.

Acknowledgements

The study was carried out at the expense of a grant Russian Science Foundation No. 23-28-00780, https://rscf.ru/project/23-28-00780/

References

1. Tereshkina N.E. // Issues of innovation economy. – 2022. – **Vol 12**. – Pp. 179-194. - doi: 10.18334/vinec 12.1.114100.
2. Shang, Zongmin. (2014). TELKOMNIKA Indonesian Journal of Electrical Engineering. **12.** 10.11591/telkomnika.v12i1.4148
3. Zott, C., Amit, R., Massa, L. (2011). Journal of management, **37(4),** 1019-1042 DOI: 10.1177/0149206311406265
4. Chesbrough, H. (2007). Strategy and Leadership, **35(6),** 12–17
5. Osterwalder, A., Pigneur, Y., (2010). Business Model Generation: A Handbook for Visionaries, Game Changers, and Challengers. John Wiley & Sons.
6. Ojasalo, K., Ojasalo, J. (2015). Adapting business model thinking to service logic: an empirical study on developing a service design tool.
7. Pfeiffer, A, (2016). Generating Business Models for Digitalized Ecosystems - Service-oriented Business Modeling (SoBM) - A Structured Modeling Approach, Conference Paper, April 2016, Smartgreens 2016, IoTBD 2016.
8. Mohapatra, Sanjay. (2013). Business Process Reengineering: A Consolidated Approach to Different Models. 10.1007/978-1-4614-6067-1_1.
9. Mohapatra, Sanjay & Choudhury, Anupam & Ganesh, Kushal. (2017). *Framework for supporting 'business process reengineering'-based business models.* International Journal of Business Innovation and Research. 13. 451. 10.1504/IJBIR.2017.10005575.
10. Korneeva A.V., Korneev G.U. Business Processes: From Value to Profit. – 2021. – No. **7 (part 2).** – Pp. 168-175. - doi: 10.17513/vinec 1795.
11. Colovic, A. (2022). Long Range Planning, **55(1).** https://doi.org/10.1016/j.lrp.2021.102083
12. Jin, Y., Ji, S., Liu, L., Wang, W. (2022). European Journal of Innovation Management, **25(5).** https://doi.org/10.1108/EJIM-02-2021-0079
13. Kuznetsova, Nina & Pukach, Galina & Pukach, Anna. (2019). Journal of International Economic Affairs. **9.** 1363. 10.18334/eo.9.2.40800.
14. Titkov, I.A. (2021Economics and society: contemporary models of development. **11**. 87-102. 10.18334/ecsoc.11.1.111735.
15. Kazakov, O. D., Azarenko, N. Y., Lysenko, A. N. (2023). Economics. Informatics, **50(4),** 781-791. https://doi.org/10.52575/2712-746X-2023-50-4-781-791

16. Simonyan, T., Tsvetcova, S., Kolgan, M., Medvedeva, Y. (2023). E3S Web of Conferences, **460**. https://doi.org/10.1051/e3sconf/202346002008
17. Kolgan, M., Medvedeva, Y., Ismagilov, E., Kostennikov, A. (2022). E3S Web of Conferences, **363**. https://doi.org/10.1051/e3sconf/202236303021.