

## ASSESSMENT OF THE RISKS AND EXPECTED ECONOMIC IMPACT OF SMALL BUSINESS GROWTH BASED ON AN ADAPTED BALANCED SCORECARD (BSC)

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**Summary.** This study examines the impact of digital transformation on small business efficiency in Russia and proposes an assessment methodology based on an adapted Balanced Scorecard (BSC). The analysis considers major digital trends, including e-commerce, artificial intelligence, digital platforms, cloud technologies, and automation, as well as key constraints such as regional digital inequality, dependence on imported technologies, cybersecurity risks, and shortages of qualified personnel. The proposed methodology integrates five dimensions of business performance: economic, operational, marketing, innovation, and social efficiency, while also accounting for the costs of implementing digital technologies. A practical calculation for a small retail enterprise demonstrates the applicability of the model and indicates that economic and marketing performance make the greatest contribution to overall efficiency, whereas high digitalization costs may reduce the final result. The findings show that cost optimization, process automation, digital marketing, and innovative technologies can improve small business efficiency and competitiveness in the digital economy.

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### Introduction

Digital transformation has become an important factor in the development and competitiveness of small businesses in Russia. Its growing influence is associated with globalization, changing consumer preferences, cost optimization, and the need to improve operational efficiency. Digital tools enable small enterprises to overcome limitations related to business scale and geographical location, expand market access, and interact with customers through electronic platforms and digital payment systems.

Changing consumer behavior further accelerates this transformation. In 2023, 42% of consumers made more than half of their purchases through digital channels, increasing the need for small businesses to adapt traditional business models. Digital technologies also contribute to cost reduction: business process automation can reduce accounting costs by approximately 50% and transportation costs by 10%. Moreover, predictive analytics and artificial intelligence applied to supply-chain management can increase labor productivity by 18–22%.

Against this background, the study aims to assess the efficiency of small businesses in Russia under digital economy conditions, identify major challenges, and develop an adapted approach for evaluating and improving their performance.

## Materials and methods

The study applies theoretical analysis, synthesis, observation, and comparison to assess the efficiency of small businesses under digital economy conditions. The research is based on relevant scientific literature, statistical data, and Internet sources. Particular attention is given to digital transformation trends, their impact on small business performance, and the adaptation of the Balanced Scorecard (BSC) approach to the digital business environment.

## Theoretical approaches

Recent research emphasizes the growing influence of digital transformation on small and medium-sized enterprises. Domestic studies examine the current state of the digital economy (Abashkin et al., 2024), digitalization opportunities and project-management tools for SMEs (Arutyunyan et al., 2023; Bagdykov et al., 2023), and the opportunities, mechanisms, and barriers associated with small business digital transformation (Myzrova et al., 2024; Stepanov, 2022).

International research conceptualizes the digital economy from several complementary perspectives. Tapscott (1996) interprets it through the development of the network economy, while Schwab (2016) associates contemporary digital transformation with the Fourth Industrial Revolution. Frey and Osborne (2013) emphasize its implications for employment, whereas Goi et al. (2023) examine the influence of digital technologies on companies' strategic management. Together, these approaches provide the theoretical basis for assessing how digital transformation affects small business efficiency.

## Results

The retrospective analysis identifies three main stages in the development of Russia's digital economy. The formation stage (1990s–early 2000s) was characterized by the emergence of Internet infrastructure, e-commerce, and the first digital services; by 2005, Internet penetration in the business environment had reached 35%. The active development stage (2000s–early 2010s) involved the rapid expansion of mobile communications, social networks, and digital business tools, with the share of companies using CRM systems increasing from 12% to 48%. The current stage (2010s–present) is characterized by deeper integration of e-commerce, digital platforms, big data, blockchain, and ecosystem-based business models, together with government programs supporting digital transformation.

Recent trends indicate a rapid expansion of Russia's digital economy, particularly in e-commerce, digital platforms, artificial intelligence (AI), and digital infrastructure. In 2023, the e-commerce market reached 7.9 trillion rubles, representing a 48% increase, with approximately 5.03 billion orders (Data Insight, 2024). Digital platforms are also expanding across transport, finance, education, and healthcare, while B2B platforms contribute to greater competitiveness and lower transaction costs (Pashkin, 2024; RAEC, 2024).

AI adoption is another major trend, particularly in process automation, customer service, and predictive analytics. The Russian AI market was expected to exceed 300 billion rubles in 2024, approximately 1.5 times the 2023 level, while exports by domestic AI vendors were also projected to increase substantially (Smart Ranking, 2024a, 2024b). The adoption of advanced AI technologies in industry is expected to increase by a further 12% (Smart Ranking, n.d.). At the same time, broadband infrastructure has expanded, with the share of the population having broadband Internet access increasing from 70% in 2020 to 85% in 2024 (Ministry of Digital Development, Communications and Mass Media of the Russian Federation, n.d.). The growing use of the Internet of Things, cloud computing, big data, and cybersecurity technologies further supports digital infrastructure and enables smaller firms to access technologies such as chatbots and predictive analytics.

Despite these developments, Russia's digital transformation faces several constraints, including regional inequality, dependence on imported technologies, cybersecurity risks, and shortages of qualified personnel. In 2023, the level of digitalization in Moscow and St. Petersburg was reported to be 60% higher than the regional average, while approximately 72% of business software was reported to be of foreign origin. Moreover, demand for IT specialists among small businesses is estimated to be only 54% satisfied (Ministry of Digital Development, Communications and Mass Media of the Russian Federation, n.d.). These limitations may restrict technological adoption and increase risks associated with digital dependence and security.

Nevertheless, digitalization provides substantial opportunities for small businesses by improving customer interaction, reducing operating costs, expanding access to alternative financing, and supporting data-driven decision-making. The institutional environment also contributes to this process through subsidies, financing mechanisms, and educational initiatives. The article reports that digitalization subsidies may cover up to 50% of SME costs, crowdlending platforms have increased access to financing by 35%, and the "Digital Professions" program has trained approximately 120,000 specialists.

These developments highlight the need for an assessment methodology that reflects the specific characteristics of small businesses operating in the digital economy. Traditional financial indicators alone may not adequately capture the effects of digital transformation. Therefore, an adapted Balanced Scorecard (BSC) approach is proposed to integrate financial and non-financial dimensions, including economic performance, customer-related outcomes, business-process efficiency, innovation, and development potential. Such an approach provides the basis for a more comprehensive assessment of small business efficiency and for identifying opportunities to improve competitiveness and sustainable development.

The formula for assessing the effectiveness of a small business entity in the digital economy may have the following form:

$$E = \frac{(Ce * We + Co * Wo + Cm * Wm + Ci * Wi + Cs * Ws)}{Tc},$$

where: E is the general effectiveness of small business in the digital economy; Ce is the coefficient of economic efficiency; We is the weight of economic efficiency in the overall assessment; Co is the coefficient of operational efficiency; Wo is the weight of operational efficiency in the overall assessment; Cm is the coefficient of marketing efficiency; Wm is the weight of marketing efficiency in the overall assessment; Ci is the coefficient of innovation efficiency; Wi is the weight of innovation efficiency in the overall assessment; Cs is the coefficient of social efficiency; Ws is the weight of social efficiency in the overall assessment; Tc is the total costs of implementing and using digital technologies.

Let's consider the concepts of the coefficients used in the formula.

1. The coefficient of economic efficiency Ce reflects the financial performance of the business due to the implementation of digital technologies. It includes the following elements: revenue growth, cost saving, pay-ability and profitability.

Calculation example:

$$Ce = \frac{(PR_2 - PR_1)}{C},$$

where PR1 and PR2 are profits before and after digitalization; C are digitalization costs.

2. The coefficient of operational efficiency Co characterizes the optimization of internal processes due to digitalization. It includes the speed of operations, reduction of errors, automation of routine tasks.

Calculation example:

$$Co = \frac{(T_2 - T_1)}{T_1},$$

where T1 and T2 denote the time before and after optimization.

3. The coefficient of marketing efficiency Cm shows the impact of digital tools on promotion and sales. It includes conversion, audience reach, ROI advertisement, and social media engagement.

Calculation example:

$$Cm = \frac{Im}{Em},$$

where Im is income from marketing; Em is expenditures for marketing.

4. The coefficient of innovation efficiency Ci evaluates the ability of a business to implement and use new technologies. It includes the number of implemented innovations, patents, the share of digital products in revenue.

Calculation example:

$$Ci = \frac{Ni}{Np},$$

where Ni is the number of innovations; Np is the total number of projects.

5. The coefficient of social efficiency Cs determines the contribution of business to society through digital technologies. It includes the level of digital literacy of employees, the environmental friendliness of processes, customer satisfaction.

An example of the calculation method:

$$Cs = \frac{Npr}{Nr},$$

where Npr is the number of positive reviews; Nr is the total number of reviews.

The costs ( $T_c$ ) for implementing digital technologies in a small business may include hardware (server systems, computers, sensors), software (licenses, subscriptions, CRM systems), personnel education (courses, trainings), implementation and configuration (IT specialist services), technical support (maintenance, updates), cybersecurity (data protection, antiviruses).

The following is an example of calculating the efficiency of a small business in one of the regions of Russia. The clothes shop implemented online sales and a CRM system.

Total costs ( $T_c$ ) amounted to 500 000 rubles.

Weights:  $W_e=0.3$ ;  $W_o=0.2$ ;  $C_m=0.25$ ;  $C_i=0.15$ ;  $C_s=0.1$ .

Calculation of coefficients:

$C_e = (1\,200\,000 - 800\,000) / 500\,000 = 0.8$ .

$C_o = (10 \text{ days} - 5 \text{ days}) / 10 = 0.5$ .

$C_m = (400\,000 \text{ rubles of income} / 200\,000 \text{ rubles of expenditures}) = 2.0$ .

$C_i = (2 \text{ new digital services} / 5 \text{ projects}) = 0.4$ .

$C_s = (85\% \text{ positive reviews} / 100\%) = 0.85$ .

The final efficiency will be:

$$E = \frac{(0.8 * 0.3 + 0.5 * 0.2 + 2.0 * 0.25 + 0.4 * 0.15 + 0.85 * 0.1)}{500\,000} = 0.00000197.$$

Conclusion: Marketing ( $C_m$ ) and economics ( $C_e$ ) contributed the most to efficiency, but high costs reduce the overall indicator. Cost optimization can increase  $E$ .

Based on the results of the project implementation, a number of measures can be proposed to improve the overall effectiveness of a small business entity in the digital economy.

1. Cost optimization ( $\downarrow T_c$ ):

- using cloud solutions instead of purchasing server systems (for example, renting CRM in SaaS format);
- gradual introduction of digital tools (not all at once);
- use of free and cheap software analogues (for example, Tilda instead of an expensive CMS).

Reducing costs by 30-40% will increase efficiency ( $E$ ) even at current coefficients.

2. Increase in the coefficient of economic efficiency ( $\uparrow C_e$ ):

- implementation of the “dynamic pricing” method (demand analysis and automatic price adjustment);
- using AI analytics to forecast purchases (reducing surplus);
- development of a “subscription and repeat sales” program (loyalty programs).

It is assumed that the increase in profit will increase  $C_e$  and provide an increase in the contribution to efficiency.

3. Improving operational efficiency ( $\uparrow C_o$ ):

- warehouse automation (1C + mobile terminals for accounting);
- implementation of chatbots for processing orders and returns;
- integration of online and offline sales (unified database of balances).

As a result, acceleration of processes should reduce labor costs and increase the value of the coefficient of operational efficiency ( $C_o$ ).

4. Enhancing the marketing efficiency ( $\uparrow C_m$ ):

- targeted advertising in social networks (VK, Telegram);
- implementation of gamification (promotional offers, quests, referral programs);
- use of UGC content (reviews, styles from buyers).

The expected effect is that an increase in conversion and marketing ROI will raise the value of the coefficient of marketing efficiency ( $C_m$ ).

5. Development of innovations ( $\uparrow C_i$ ):

- implementation of a VR (virtual) fitting room on the website;
- using NFT (digital tokens) to verify brand authenticity;
- launch of AI stylist (selection of looks based on preferences).

These unique technologies are expected to increase  $C_i$  and attract new audiences.

6. Improving social efficiency ( $\uparrow C_s$ ):

- implementation of a program for environmentally friendly packaging and clothing recycling;
- training employees in digital skills through free courses;
- support for local designers (collaborations).

It is expected that the company's reputation will improve and customer loyalty will increase. The expected effect will increase the value of the coefficient of social efficiency (Cs).

Final efficiency forecast. If we reduce costs (Tc) to 300 000 rubles and increase coefficients by 20-30%, then:

$$E_{\text{project}} = \frac{(0.96 * 0.3 + 0.6 * 0.2 + 2.4 * 0.25 + 0.48 * 0.15 + 1.0 * 0.1)}{300\,000} = 0.000003$$

As can be seen, as a result of the project implementation, the efficiency increase will be 1.5 times.

The greatest effect will be achieved by measures for reducing costs (cloud technologies, gradual implementation), enhance marketing and automation (targeting, chatbots), and introduce innovations (VR fitting room, AI analytics), which will make the business more profitable, technologically advanced, and competitive in the digital economy.

## Conclusion

The present research confirms that digital transformation has a significant impact on the effectiveness of small businesses in Russia. The development of e-commerce, the introduction of artificial intelligence and cloud technologies create new opportunities for growth. However, the key problems, such as uneven digitalization in regions, dependence on foreign technologies, a shortage of qualified specialists and cybersecurity risks, still remain.

The proposed methodology for assessing efficiency, based on the adapted BSC model, allows for a comprehensive consideration of both financial and non-financial performance indicators of small enterprises. A practical calculation using a retail store as an example showed that marketing activity and economic efficiency make the greatest contribution to efficiency, but high digitalization costs can reduce the overall indicator.

To improve efficiency, the following is recommended:

- Cost optimization through cloud solutions and gradual implementation of technologies.
- Automation of operational processes (CRM, chatbots, data analytics).
- Development of digital marketing (targeted advertising, gamification).
- Implementation of innovative solutions (AI, VR, blockchain).
- Improving social responsibility and digital literacy of employees.

Prospects for further research are related to the development of more accurate metrics for assessing the digital maturity of small businesses and the analysis of the long-term effects of digitalization in various industries.

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## ОЦЕНКА РИСКОВ И ОЖИДАЕМОГО ЭКОНОМИЧЕСКОГО ЭФФЕКТА ОТ РАЗВИТИЯ МАЛОГО БИЗНЕСА НА ОСНОВЕ АДАПТИРОВАННОЙ СИСТЕМЫ СБАЛАНСИРОВАННЫХ ПОКАЗАТЕЛЕЙ (ССП)

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**Резюме.** В исследовании рассматривается влияние цифровой трансформации на эффективность малого бизнеса в России и предлагается методика оценки, основанная на адаптированной системе сбалансированных показателей (Balanced Scorecard – BSC). В ходе анализа рассматриваются основные цифровые тенденции, включая электронную коммерцию, искусственный интеллект, цифровые платформы, облачные технологии и автоматизацию, а также ключевые ограничения, такие как региональное цифровое неравенство, зависимость от импортных технологий, риски кибербезопасности и дефицит квалифицированных кадров. Предлагаемая методика объединяет пять направлений оценки эффективности деятельности бизнеса: экономическую, операционную, маркетинговую, инновационную и социальную эффективность, одновременно учитывая затраты на внедрение цифровых технологий. Практический расчёт на примере малого предприятия розничной торговли демонстрирует применимость модели и показывает, что наибольший вклад в общую эффективность вносят экономические и маркетинговые показатели, тогда как высокие затраты на цифровизацию могут снижать конечный результат. Результаты исследования показывают, что оптимизация затрат, автоматизация процессов, цифровой маркетинг и инновационные технологии могут способствовать повышению эффективности и конкурентоспособности малого бизнеса в условиях цифровой экономики.

**Ключевые слова:** цифровая экономика, малый бизнес, эффективность, оценка, тенденции, развитие, проблемы, инфраструктура

## UYĞUNLAŞDIRILMIŞ BALANSLAŞDIRILMIŞ GÖSTƏRİCİLƏR SİSTEMİ (BGS) ƏSASINDA KİÇİK BİZNESİN İNKİŞAFINDAN YARANAN RİSKLƏRİN VƏ GÖZLƏNİLƏN İQTİSADI SƏMƏRƏNİN QIYMƏTLƏNDİRİLMƏSİ

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**Xülasə.** Tədqiqatda rəqəmsal transformasiyanın Rusiyada kiçik biznesin səmərəliliyinə təsiri araşdırılır və uyğunlaşdırılmış Balanslaşdırılmış Göstəricilər Sisteminə (Balanced Scorecard – BSC) əsaslanan qiymətləndirmə metodologiyası təklif olunur. Təhlildə elektron ticarət, süni intellekt, rəqəmsal platformalar, bulud texnologiyaları və avtomatlaşdırma da daxil olmaqla əsas rəqəmsal tendensiya, eləcə də regional rəqəmsal bərabərsizlik, idxal texnologiyalarından asılılıq, kibertəhlükəsizlik riskləri və ixtisaslı kadr çatışmazlığı kimi başlıca məhdudiyyətlər nəzərdən keçirilir. Təklif olunan metodologiya rəqəmsal texnologiyaların tətbiqi xərclərini də nəzərə almaqla biznes fəaliyyətinin səmərəliliyinin beş istiqamətini – iqtisadi, əməliyyat, marketinq, innovasiya və sosial səmərəliliyi birləşdirir. Kiçik pərakəndə ticarət müəssisəsi üzrə aparılmış praktiki hesablama modelin tətbiq oluna biləcəyini nümayiş etdirir və ümumi səmərəliliyə ən böyük töhfənin iqtisadi və marketinq göstəriciləri tərəfindən verildiyini, rəqəmsallaşmaya çəkilən yüksək xərclərin isə yekun nəticəni azalda biləcəyini göstərir. Tədqiqatın nəticələri xərclərin optimallaşdırılmasının, proseslərin avtomatlaşdırılmasının, rəqəmsal marketinqin və innovativ texnologiyaların rəqəmsal iqtisadiyyat şəraitində kiçik biznesin səmərəliliyini və rəqabət qabiliyyətini artırma biləcəyini göstərir.

**Açar sözlər:** rəqəmsal iqtisadiyyat, kiçik biznes, səmərəlilik, qiymətləndirmə, meyllər, inkişaf, problemlər, infrastruktur