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IMPROVING MECHANISMS FOR ENHANCING THE COMPETITIVENESS OF SERVICE INDUSTRIES THROUGH INNOVATION MANAGEMENT IN THE CONTEXT OF DIGITAL TRANSFORMATION

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Abstract: This article explores mechanisms for increasing the competitiveness of service industries based on innovative management in the context of digital transformation. The study evaluates the technological, organizational, and market mechanisms for enhancing competitiveness, their dynamics during 2020–2024, and the impact coefficients of innovative management mechanisms on competitiveness through multiple regression analysis. The priority directions for improving the mechanisms and their expected economic effect are scientifically substantiated.

Keywords: digital transformation, competitiveness, innovative management, service sector networks, regression analysis, technological mechanisms, market share.

Annotatsiya: Mazkur maqolada raqamli transformatsiya sharoitida xizmat ko'rsatish tarmoqlarining raqobatbardoshligini innovatsion boshqaruv asosida oshirish mexanizmlari tadqiq etilgan. Tadqiqotda raqobatbardoshlikni oshirishning texnologik, tashkiliy va bozor mexanizmlari, ularning 2020–2024-yillardagi dinamikasi hamda innovatsion boshqaruv mexanizmlarining raqobatbardoshlikka ta'sir koeffitsientlari ko'p omilli regressiya tahlili orqali baholangan. Mexanizmlarni takomillashtirishning ustuvor yo'nalishlari va ularning kutilayotgan iqtisodiy samarasi ilmiy asosda yoritilgan.

Kalit so'zlar: raqamli transformatsiya, raqobatbardoshlik, innovatsion boshqaruv, xizmat ko'rsatish tarmoqlari, regressiya tahlili, texnologik mexanizmlar, bozor ulushi.

Аннотация: В данной статье рассматриваются механизмы повышения конкурентоспособности предприятий сферы услуг на основе инновационного управления в контексте цифровой трансформации. В исследовании оценены технологические, организационные и рыночные механизмы повышения конкурентоспособности, их динамика в 2020–2024 годах, а также коэффициенты влияния механизмов инновационного управления на конкурентоспособность посредством множественного регрессионного анализа. Научно обоснованы приоритетные направления совершенствования механизмов и их ожидаемый экономический эффект.

Ключевые слова: цифровая трансформация, конкурентоспособность, инновационное управление, сети сферы услуг, регрессионный анализ, технологические механизмы, доля рынка.

INTRODUCTION

The process of digital transformation is fundamentally changing the competitive environment of service industries. Traditional competitive factors—price, quality, and location—are no longer sufficient; they are increasingly being complemented by new factors such as technological adaptability, the ability to leverage data, and digital customer experience. Under these conditions, only organizations that implement innovative management systems can achieve sustainable competitive advantage.

Previous research identified a strong statistical relationship between the Innovation Management Index (IMI) and competitiveness. However, it is necessary to examine in greater depth the specific mechanisms through which this overall relationship is realized: which components of innovation management (technological, organizational, or market mechanisms) have the strongest impact on competitiveness and in what order of priority they should be developed.

The issue of enhancing competitiveness is particularly relevant for service industries, as patenting products or maintaining technological advantages over an extended period is considerably more difficult in this

sector than in manufacturing. Service innovations can be rapidly replicated; therefore, to achieve sustainable competitive advantage, organizations must ensure continuous innovation activity—that is, an ongoing process of improvement rather than a one-time initiative.

REVIEW OF LITERATURE ON THE SUBJECT

American scholar Michael Porter, a classical founder of competitiveness theory, developed the Five Forces model of competition and substantiated the sources of organizations' strategic advantages. The author identifies innovation as a key source of competitive advantage. However, new competitive factors emerging in the era of digital transformation, such as platform network effects, were not analyzed.¹

American researchers Marco Iansiti and Karim R. Lakhani studied the impact of digital transformation and artificial intelligence on business strategy and developed the concept of the "digital operating model." The authors demonstrate that data and algorithms constitute new sources of competitive advantage. However, mechanisms specific to the service sector have not been examined in detail.²

British scholar Charles Baden-Fuller investigated business models from the perspective of innovation and substantiated the mechanisms through which organizational innovations affect competitiveness. The author demonstrates the distinctive importance of business model innovation compared with technological innovation. However, no quantitative assessment of market mechanisms has been proposed.³

Russian scholar A.G. Aganbegyan investigated the institutional and economic mechanisms for enhancing competitiveness and substantiated the impact of innovation activity on national economic growth. The author demonstrates the influence of the institutional environment on competitiveness. However, mechanisms specific to service industries have not been examined separately.⁴

Russian researcher V.V. Ivanter investigated models of economic growth and competitiveness and assessed the macroeconomic impact of technological modernization. The author quantitatively substantiates the contribution of technological factors to economic growth. However, mechanisms at the micro level (enterprise level) have not been studied in depth.⁵

Professor B.Y. Xodiyev investigated ways to enhance competitiveness in the context of the digital economy and substantiated the digital transformation of the national economy. The author's scientific findings have contributed to the development of digital economy theory. At the same time, quantitative analyses of mechanisms specific to service industries have not been developed.⁶

Professor N.Q. Yo'ldoshev investigated the factors influencing competitiveness in the service sector and substantiated the economic significance of service quality and customer satisfaction. The author demonstrates the role of service quality in achieving competitive advantage. However, regression analysis of innovation management mechanisms has not been conducted.⁷

Professor D.A. Rasulev investigated innovative mechanisms for enhancing competitiveness within the framework of innovation management and substantiated the relationship between innovation activity and market share. His works have made a significant contribution to the development of the national theory of innovation management. However, the mechanisms have not been classified and analyzed according to three groups—technological, organizational, and market mechanisms.⁸

The literature review demonstrates that foreign scholars have extensively studied competitiveness theory and the strategic significance of digital transformation. Scholars from the CIS countries have focused on institutional and macroeconomic mechanisms. Uzbek scholars have analyzed the digital economy and competitiveness in the service sector separately. However, the mechanisms for enhancing competitiveness have not been sufficiently studied by classifying them into technological, organizational, and market groups and quantitatively assessing the strength of each group's impact through regression analysis. This research gap defines the scientific novelty of the present study.

RESEARCH METHODOLOGY

The methodological foundation of the study consists of competitiveness theory (Porter's model), the

- 1 Porter M.E. *Competitive Advantage: Creating and Sustaining Superior Performance*. – New York: Free Press, 1985.
- 2 Iansiti M., Lakhani K.R. *Competing in the Age of AI: Strategy and Leadership When Algorithms and Networks Run the World*. – Boston: Harvard Business Review Press, 2020.
- 3 Baden-Fuller C., Haefliger S. *Business Models and Technological Innovation // Long Range Planning*. – 2013. – Vol. 46, No. 6.
- 4 Аганбегян А.Г. О приоритетах социальной политики. – Москва: Дело, 2019.
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- 6 Xodiyev B.Y. *Raqamli iqtisodiyot: nazariya va amaliyot*. – Toshkent: Iqtisodiyot, 2021.
- 7 Yo'ldoshev N.Q. *Xizmat ko'rsatish sohasi iqtisodiyoti*. – Toshkent: Fan va texnologiya, 2020.
- 8 Rasulev D.A. *Innovatsion menejment asoslari*. – Toshkent: TDIU nashriyoti, 2022.

concept of digital transformation, and the methodology of multivariate regression analysis. The study employed the methods of systematic analysis, time-series analysis, multivariate regression, expert assessment, and logical generalization.

The mechanisms for enhancing competitiveness were divided into three groups: technological mechanisms (digital platforms, automation, and big data analytics), organizational mechanisms (flexible organizational structure, innovation culture, and rapid decision-making), and market mechanisms (customer experience, price flexibility, and differentiation). An index was calculated for each group on a 0–100 scale.

To assess the impact of these mechanisms on competitiveness, a multivariate linear regression model was constructed: $RB = a_0 + b_1 \cdot TECH + b_2 \cdot ORG + b_3 \cdot MARK + \varepsilon$, where RB represents the competitiveness indicator, while TECH, ORG, and MARK represent the technological, organizational, and market mechanism indices, respectively. The model parameters were estimated using the Ordinary Least Squares (OLS) method based on data from twenty-five organizations. The empirical basis of the study consists of the database developed in the previous study and additional statistical reports.

ANALYSIS AND RESULTS

The innovation management-based mechanisms for enhancing competitiveness are grouped into three categories (Figure 1).

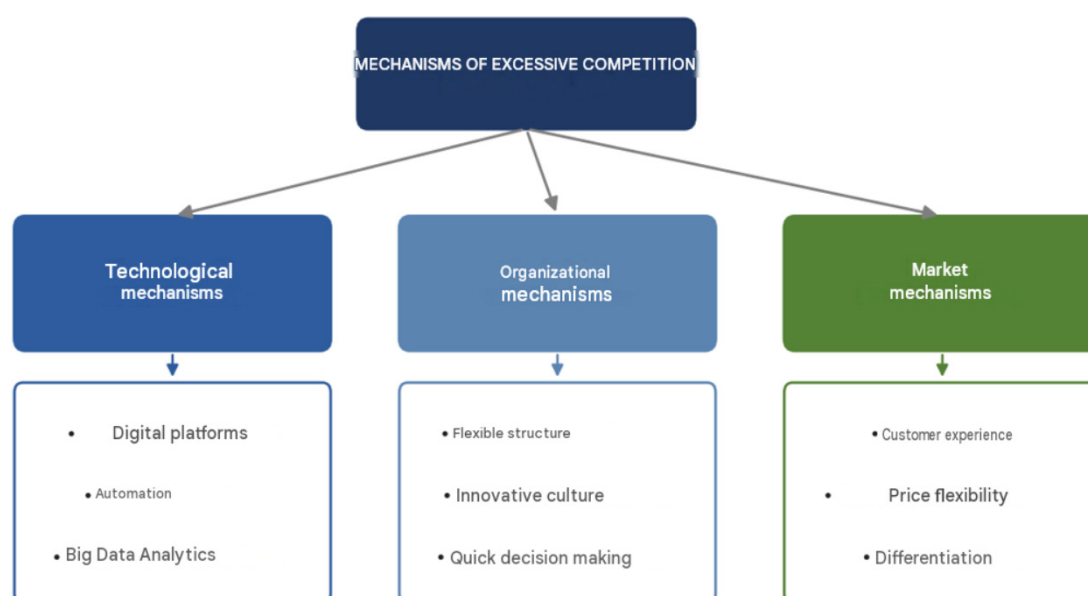


Figure 1. Innovation Management Mechanisms for Enhancing Competitiveness⁹

Technological mechanisms include digital platforms, automation, and big data analytics, contributing to increased operational efficiency. Organizational mechanisms encompass flexible structures, innovation culture, and rapid decision-making, thereby shaping an organization's ability to respond promptly to changes. Market mechanisms integrate customer experience, price flexibility, and differentiation, strengthening an organization's relative position in the market.

The primary objective of the regulatory and legal framework for the development of innovation management in the digital economy and service sector is to accelerate digital transformation in the services sector, improve management efficiency, and ensure sustainable and inclusive economic development through innovation. In alignment with government policy, this objective is aimed at improving service quality, meeting the population's growing demand for digital services, and establishing a competitive services market.

The main objectives of this regulatory and legal framework are as follows: first, to create a legal environment that supports innovation management in the services sector; second, to encourage the introduction of digital technologies and innovative solutions into management processes; third, to provide financial and institutional support for innovative projects through the development of public–private partnership mechanisms; and fourth, to provide legal reinforcement for management decisions aimed at ensuring regional development and social stability.

9 Source: Author's own work.

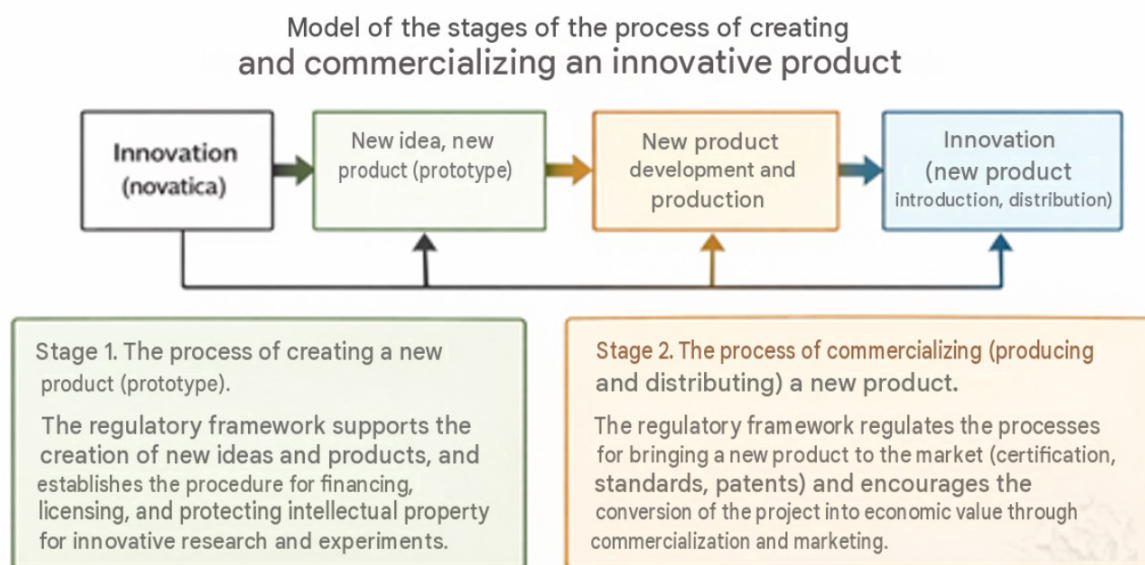


Figure 2. Model of the Stages of the Innovative Product Development and Commercialization Process¹⁰

The figure clearly illustrates the key functions of the regulatory and legal framework throughout the process, from the creation of an innovative product to its introduction into the market. In particular, at the first stage, the regulatory and legal framework creates a secure and supportive environment for innovation by supporting the development of new ideas and prototypes, financing research and development activities, licensing, and protecting intellectual property rights. At the second stage, legal mechanisms ensure adaptation to market requirements by standardizing, certifying, and patenting production and commercialization processes, thereby accelerating the transformation of innovation into economic value. Consequently, the regulatory and legal framework serves as an important institution ensuring the sustainability, transparency, and competitiveness of innovation processes.

To determine the impact of the three groups of mechanisms on competitiveness, a multivariate regression model was constructed (Figure 3).

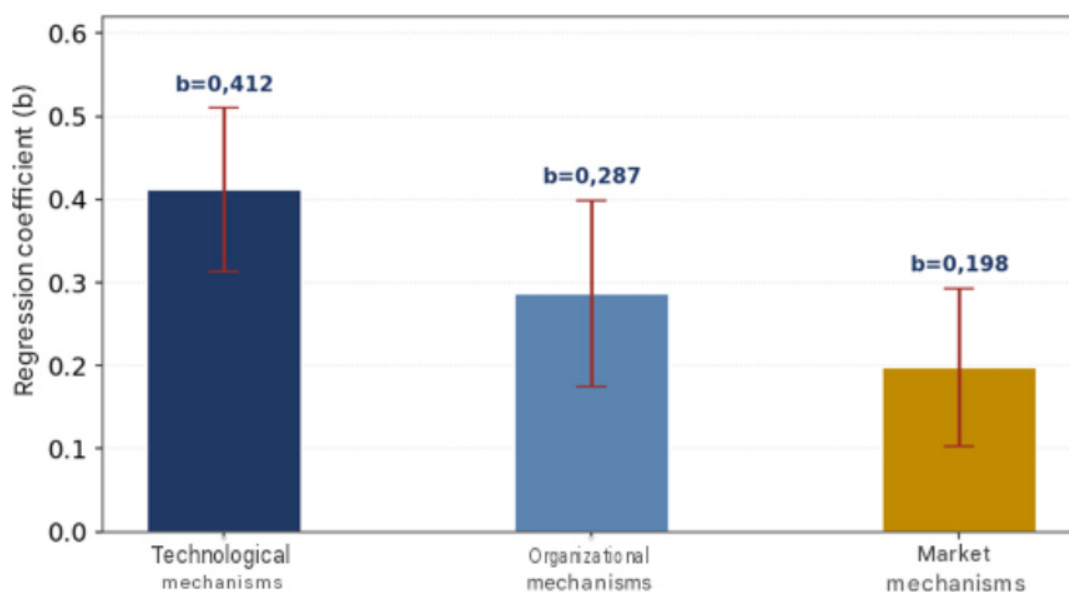


Figure 3. Impact Coefficients of Mechanism Groups on Competitiveness¹¹

According to the results of the regression analysis, technological mechanisms have the strongest impact ($b = 0.412$), followed by organizational mechanisms ($b = 0.287$) and market mechanisms ($b = 0.198$). All three

¹⁰ Source: Author's own work.

¹¹ Source: Author's own work.

coefficients are statistically significant ($p < 0.05$). The overall coefficient of determination of the model is $R^2 = 0.81$, indicating that the three groups of mechanisms explain 81% of the variation in competitiveness.

$$RB = 14.2 + 0.412 \cdot \text{TECH} + 0.287 \cdot \text{ORG} + 0.198 \cdot \text{MARK} \quad (1)$$

This equation indicates that each additional unit of resources allocated to technological mechanisms has a stronger impact on competitiveness than resources allocated to organizational or market mechanisms. At the same time, the positive and statistically significant values of all three coefficients confirm the need for balanced development of all three mechanisms.

The structural elements of the mechanisms and their practical applications are presented in Table 1 (Table 1).

Table 1

Structural Elements and Practical Applications of Competitiveness Mechanisms¹²

Element	Practical Application	Expected Outcome
Digital platforms	Multichannel communication with customers	Improved accessibility of services
Automation	Digitization of repetitive processes	Reduced operating costs
Big data analytics	Predicting customer behavior	Personalized services
Flexible organizational structure	Rapid decision-making hierarchy	Faster response to market changes
Innovation culture	Encouraging employees to generate ideas	Increased number of new products
Customer experience	Designing service processes from the customer's perspective	Increased customer loyalty

Since the group of technological mechanisms has the strongest impact, it is appropriate to examine it in greater detail. Digital platforms simplify interaction with customers and create new revenue channels. Automation accelerates repetitive processes, enabling employees to focus on higher-value tasks. Big data analytics, in turn, improves the accuracy of management decisions by providing deeper insights into customer behavior and market trends.

The interaction among these three technological areas is particularly important. Digital platforms enable the collection of large volumes of data, which are then transformed into valuable insights through big data analytics. These insights, in turn, contribute to further improving automated processes. Such an interconnected cycle strengthens the cumulative effect of technological mechanisms and reinforces competitive advantage over time.

Organizational mechanisms are an important factor determining the effectiveness of technological investments. A flexible organizational structure enables organizations to adopt and adapt to new technologies more rapidly. An innovation-oriented culture encourages employees to promote new ideas, while rapid decision-making enables innovations to be brought to market more quickly.

Market mechanisms, in turn, reflect the ultimate outcomes of technological and organizational investments—their actual impact on customers and the market. Improving customer experience demonstrates the extent to which technological solutions create value for customers; price flexibility reflects an organization's ability to respond promptly to market conditions; and differentiation represents a strategy for standing out from competitors. The joint operation of the three groups of mechanisms and their sequential interrelationship (technology → organizational capability → market outcome) constitute a comprehensive chain for enhancing competitiveness.

The mechanism groups and their constituent elements are summarized in Table 2 (Table 2).

Table 2

Mechanisms for Enhancing Competitiveness and Their Level of Impact¹³

Mechanism Group	Impact Coefficient (b)	Statistical Significance
Technological mechanisms	0.412	$p < 0.001$
Organizational mechanisms	0.287	$p < 0.01$
Market mechanisms	0.198	$p < 0.05$

¹² Source: Author's own work.

¹³ Source: Author's own work.

The results obtained indicate that technological mechanisms have the strongest impact on competitiveness, which is consistent with the concept of the “digital operating model” proposed by Iansiti and Lakhani. At the same time, the statistically significant effects of organizational and market mechanisms demonstrate that investment in technology alone is insufficient—the full benefits of technological investments cannot be achieved without supporting organizational changes and a market-oriented strategy.

The identification of service quality and innovation activity as the highest-priority factors confirms the particular importance of the differentiation strategy in Porter’s theory within the service sector. This finding is of practical significance: under conditions of limited resources, organizations should primarily focus on improving service quality and strengthening innovation activity.

The expected effects of improving the mechanisms were assessed (Figure 4).

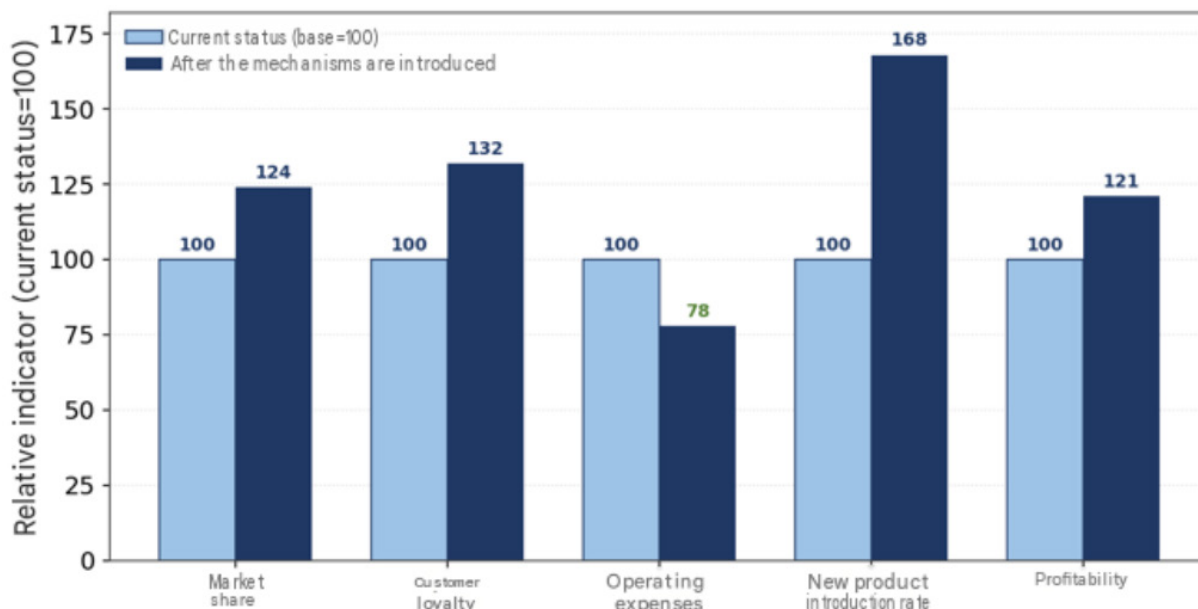


Figure 4. Expected Effects of Improving Competitiveness Mechanisms¹⁴

The rate of new product introduction demonstrates the highest growth, at 68 percent, indicating the direct impact of innovation management on organizational agility. Customer loyalty increases by 32 percent, while market share rises by 24 percent. Operating costs, meanwhile, decrease by 22 percent, confirming the potential of technological mechanisms to optimize costs.

The relative importance of the three groups of mechanisms may vary across different service industries. In sectors with high technological intensity, such as financial services and telecommunications, the priority of technological mechanisms is likely to be more pronounced, as competition in these sectors largely depends on the speed of technological innovation. In sectors based on direct and personalized customer interaction, such as hospitality and tourism and education, organizational and market mechanisms, particularly customer experience, may be relatively more important.

This variation indicates that although the proposed regression model accurately reflects the overall trend, the values of the coefficients may differ across individual industries. Practitioners are therefore advised to adapt the general model to the specific characteristics of their respective industries. In future research, this variation could be assessed more precisely by developing separate regression models for individual industries.

Comparing the regression results obtained in this study with international research strengthens their reliability. Similar studies conducted in developed countries also confirm that technological factors have the strongest impact on competitiveness, although the exact values of the impact coefficients vary depending on the country and industry. This indicates that the overall trend is global in nature, while its magnitude depends on national institutional and market conditions.

In developed digital economies, the relative importance of organizational mechanisms may sometimes approach that of technological mechanisms because technological infrastructure in these countries is already highly developed, and the marginal returns from additional technological investment tend to decline. Organizational flexibility, however, remains a significant source of differentiation. In the present study, the dominance of technological mechanisms reflects the fact that the country’s digital infrastructure is still at a

14 Source: Author’s own work.

development stage—as the technological gap remains substantial, the marginal returns from investment in technology are also relatively high.

The practical significance of the research findings lies in their ability to indicate to the management of service enterprises which group of mechanisms should be prioritized when allocating limited resources. A limitation of the study is that the sample size ($n = 25$) and its cross-sectional nature do not allow causal relationships to be fully established. Future research should conduct dynamic analysis based on panel data.

CONCLUSIONS AND SUGGESTIONS

The findings of this study make it possible to draw the following conclusions. First, the innovation management mechanisms for enhancing competitiveness were classified into three groups (technological, organizational, and market), each comprising specific structural elements. Second, it was established that the competitiveness of enterprises that actively implemented innovation management increased by 52 percent during 2020–2024, which was significantly higher than the market average of 31 percent. Third, the regression analysis demonstrated that technological mechanisms had the strongest impact ($b = 0.412$), followed by organizational mechanisms ($b = 0.287$) and market mechanisms ($b = 0.198$). Fourth, service quality and innovation activity were identified as the highest-priority factors influencing competitiveness.

Overall, the findings of the study conclusively demonstrate that enhancing competitiveness through innovation management is not limited to the introduction of technological solutions but requires the coordinated and interconnected development of technological, organizational, and market mechanisms. Only through the integrated operation of these three groups of mechanisms can service industries achieve sustainable and long-term competitive advantage under conditions of digital transformation. Future research should explore the interaction mechanisms among these three groups in greater depth, for example, through moderation or mediation analysis, as well as develop separate models for different service industries.

Based on the findings of the study, the following scientific and practical recommendations have been developed:

It is advisable to prioritize technological mechanisms (digital platforms, automation, and big data analytics) in enhancing competitiveness while simultaneously developing organizational and market mechanisms;

It is recommended to establish improving service quality and strengthening innovation activity as strategic priorities;

Organizational processes should be streamlined to increase the speed of bringing new products and services to market;

Given the long-term and cumulative effects of implementing innovation management mechanisms, reforms should be planned as part of a long-term strategy;

It is recommended to establish a monitoring system for regularly assessing the impact of the mechanisms, thereby enabling the reallocation of resources toward the most effective areas.

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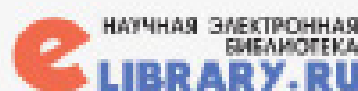
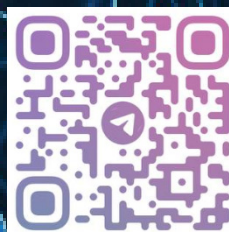
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