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Decoding funding dynamics for AI start-ups: Investor influence, innovation strategies, and ecosystem synergies

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Abstract

In this research, we analyze the multiple relationships of funding for AI start-ups and specify investor influence, technological changes, and funding types within a start-up ecosystem. The research has identified over 500 relevant AI start-ups and splits the analysis based on regions and time into several years from 2019 to 2024. The research focuses on issues such as the involvement of venture capitalists, corporate investors, governmental support, and funding models of AI businesses. This study makes use of both descriptive statistics of financial and operational data and subjective data collection from the identified start-up founders, investors, and policymakers. Machine learning algorithms, statistical tools like R and Python, and business intelligence tools like Tableau are used to analyze patterns of funding to determine patterns in the data sets. To enhance the findings, the study also relies on secondary data from local and international venture capital databases and financial statements. Some of the findings have to do with ways in which funding ecosystems shape the technological development path of AI start-ups through, inter alia, emphasizing ethical approaches to AI, regulatory frameworks, and sustaining innovations. The study highlights the standout of investor preferences, systematic positioning of innovation centers, and socio-cultural imperative of multi-stakeholder collaboration as the drivers of sustainable growth. In addition, it recognizes challenges such as selection algorithm bias and data privacy issues and it presents policy suggestions regarding funding approaches. The present work advances the knowledge in the field by presenting an overall model of funding processes in AI start-ups, explaining the actions of investors, and providing tools for entrepreneurs. It also educates policymakers about specific areas that should be prioritized to enable a positive culture of unleashing and supporting AI, thereby filling knowledge gaps, and reinforcement AI stability and growth.

Keywords: artificial intelligence, start-up ecosystems, venture capital, innovation dynamics, funding mechanisms

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分析人工智能初创企业的融资动态：投资者影响、创新战略和生态系统协同效应

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简介

本文研究了人工智能初创企业资金之间的多重相互联系，并确定了初创企业生态系统中投资者、技术变革和资金类型的影响。研究涵盖 2019 年至 2024 年，确定了 500 多家有前途的人工智能初创企业。在进行分析时，考虑到了地区的具体情况和随着时间推移的发展动态。本研究重点关注人工智能公司的融资问题，包括风险资本和企业投资者的作用、政府支持以及各种融资模式。本研究采用描述性统计、机器学习和定性数据相结合的综合方法来研究初创企业的融资模式。分析包括使用 R、Python 和 Tableau 处理财务和运营数据，以及创始人、投资者和决策者的主观评价。来自风险投资数据库和财务报告的二手数据被用来验证和扩展研究结果。资金生态系统在决定人工智能初创企业的发展轨迹方面发挥着关键作用。研究表明，正是资金影响着公司对人工智能道德、合规和创新的关注程度。为确保可持续增长，有必要考虑投资者的利益，为创新中心创造有利环境，并促进国际合作。本文还分析了与算法偏差和保护敏感数据相关的风险，并就更有效的资助政策提出了建议。本研究为人工智能初创企业、投资者和政策制定者提供了实用指南。它提出了一个全面的融资模型，解释了投资者的动机，并为寻求融资的创业者提供了工具。此外，该研究还为政策制定者指出了创造有利环境的优先领域，以促进和支持人工智能，从而填补知识空白并确保该行业的可持续增长。

关键词： 人工智能、初创企业生态系统、风险投资、创新动力、融资机制

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1. Introduction and background

Artificial Intelligence (AI) has a future as an insightful technology that provides opportunities for sectors such as health, finance, education, and logistics. A significant role in the advancement of AI technology and its commercialisation is played by start-ups that focus on ongoing innovation and fast-moving strategies due to their very nature [Schulte-Althoff et al., 2021; Kulkov, 2023]. However, on the one hand, AI start-ups have great potential, but, on the other, they often face multiple problems when attempting to obtain sufficient funding to scale-up operations and achieve sustainable growth. The investment in AI start-ups is also influenced by institutions such as venture capitalists, corporate investors, local, and national governments, and innovation hubs, each with different expectations and contributions [Bertoni, Bertoni, 2022].

2019–2024 saw an increase in funding for AI start-ups due to the growing interest of investors in the efficient and practical solutions for AI deployment. This period also saw increased focus on ethics in AI, establishing regulatory frameworks, and alliances cutting across different fields to address issues such as data protection and fairness in machine learning [Sloane, Zakrzewski, 2022]. Concerning the growth of entrepreneurship, access to strategic capital from some sort of financing has been strongly influenced by opportunies presented in environments with limited resources. However, [Rena, 2009] calls for promoting the concept of entrepreneurship as a driver of economic growth in rural areas due to innovations by entrepreneurs. This view is in line with the study, which also investigates AI start-ups as agents of change in technology-based economies.

In the area of education, the effects of limited funding in developing countries have been addressed by other authors from a wider perspective. For instance, [Rena, Kidane, 2009] presented a view that supports the work done and investment in systems but recommends that this should be followed by work on innovation, which correlates well with the ideas presented in the current work regarding structured funding mechanisms for AI start-ups.

Nevertheless, more expansion of technology, investors, and funding instrument connections are still needed for further study. Uncovering these dynamics is crusial to making timely and right decisions about investments and growth within the AI start-up environment [Prado, Bauer, 2022].

To that end, this research aims to understand the complexity of funding for AI start-ups, as well as how investors, regulatory bodies and ecosystem environments impact these companies' success factors.

To understand the features of support for AI start-ups, we need to consider how investors, technology, and the environment interact, and develop recommendations for improving funding effectiveness and creating new technologies.

Objectives are:

- to assess the impact that investors' preferences have on the probability of funding AI start-ups;
- to determine which processes and value propositions receive the most funding;
- to analyse the influence of innovation hubs, incubators, and accelerators on AI start-up development;
- to analyse how legal requirements and ethical considerations affect funding.

In order to serve as a strategic guideline instrumentally for improving funding results for the aforementioned stakeholders.

Prior studies offer information about different elements of start-up ecosystems, including VC evolution and the influence of technology. However, there is insufficient information to understand the funding dynamics of specific nature to AI start-ups. Many papers focus on technological aspects or the investor's perspective, while the primary dimensions do not provide a holistic view [Filieri et al., 2021; Schulte-Althoff et al., 2021]. Additionally, related research does not focus solely on the regulatory compliance, ethical aspects of AI, the interaction between funding sectors and fields, etc. [Sloane, Zakrzewski, 2022; Bellina, Jungmann, 2023].

This study aims to fill these gaps by analysing the funding prospects for AI start-ups, through the use of quantitative and qualitative methods with an overall goal of narrowing the research gap that exists between technology, investment and policy dimensions.

2. Problem statement

Thus, while the use of artificial intelligence is rapidly gaining momentum, as evidenced by the exponential growth in start-up innovations driven by AI, start-ups themselves face a myriad of challenges when it comes to financing. The problem is that there is no clear understanding of how investors' preferences, technological changes, and support systems affect funding outcomes. This gap hinders the ability of start-ups to align their strategies with those of investors. It also affects the effectiveness of policy interventions aimed at encouraging innovation. Solving this problem is crucial for improving the effectiveness of funding models and ensuring the future financing of breakthroughs in Artificial Intelligence.

Another important fundamental analysis provided by [Schulte-Althoff et al., 2021], who states that VC plays an important role in the funding of early-stage AI innovations. They pointed out that AI tech solutions are portable which supports the main hypothesis that the funding results depend on the availability of a solid

innovation environment. In support of these findings, [Kulkov, 2023] makes use of samples that include healthcare AI start-ups as some of the best examples of VC engagement and the way business models can be adapted to attract VCs and respect the needs of the law. In like manner, [Filieri et al., 2021] also look at tourism-specific AI start-ups and describe how select forms of applications can generate funding outcomes.

Some of the people who share these ideas include [Prado, Bauer, 2022], who hold the view that venture capital funding is indispensable in promoting innovation in emerging tech start-ups. They emphasise that the active cooperation between investors and start-ups also increases the availability of the ethical AI solutions and compliance with standards. Similarly, [Bellina, Jungmann, 2023] suggest that better cooperation should be made between established companies and AI start-ups to assist them in removing issues related to funding and operation.

Researchers who hold somewhat dissimilar but comparable ideas are [Rasiwala, Kohli, 2021], are studying fintech. They argue that, given that AI technologies exist in financial services, they disrupt the existing systems. Investors seek to patronise start-up firms that offer high revenue and comply with the regulations. [Sloane, Zakrzewski, 2022] build on this reasoning by offering a view from a socio-technical perspective, evaluating how ethics and societal practices influence funding opportunities for AI start-ups in Europe.

Therefore, authors with opposing views, such as [Huergo, López, 2022; Tricot, 2022], argue that subsidies and government assistance, rather than venture capital, finance the development of AI. They argue that the over-reliance of these firms on VC precipitates short-sighted strategies that primarily target short-term profits, at the expense of long-term technological development and the well-being of society. This dilemma raises a question: where and how strike the right tone between satisfying private investors' gains, on one hand, and considering the social impact of AI, on the other hand?

This leads to our research question: To what extent do investor tastes, technological trends and ecosystems influence the funding of AI start-ups?

To answer this question, we need to address the following issues: the place of venture capital, ethical and regulatory concerns, and the effect of cross-sector partnerships. According to a literature review, a conceptual framework is most appropriate for this study because it combines various ideas into a unified framework.

The most valuable contributions to this framework are [Schulte-Althoff et al., 2021; Prado, Bauer, 2022; Kulkov, 2023]. M. Schulte-Althoff and co-authors, as well as I. Kulkov, highlight general and important aspects of understanding the impact of VC on AI start-up growth, as well as specific industry approaches. This is complemented by T. Prado and J. Bauer who include complexity by discussing collaborative innovation ecosystems.

From this body of work, the following key concepts emerge:

1. Investor influence

Investor decision-making relates to the extent to which investors' choices and knowledge about a specific field will impact the funding allocated to AI start-ups. The basis for evaluating start-ups concerns investors, such as VCs, corporate Venture Arms, and Angel Investors. Evaluation fundamentals include market potential, scalability, and team skills [Schulte-Althoff et al., 2021]. Recognising promising business opportunities usually influences funding outomes, aiming to fund start-ups that match market patterns and future needs [Kulkov, 2023].

For instance, [Prado, Bauer, 2022], explain the fact that venture capital funding focuses more on start-ups with winning proposals of how they plan to execute their ideas in the market. Likewise, [Rasiwala, Kohli, 2021] also note that investor networks help bring attention to start-ups and increase their legitimacy when it comes to the acquiring funds. However, as E. Huergo and A. López discuss in their paper [Huergo, López, 2022], it could sometimes lead to a focus on profit-oriented outcomes rather than solutions that benefit society. The funding mechanisms that have evolved cover a full cycle starting from traditional sources to social funding, such as crowdfunding. As cited in [Paul, Rena, 2024], digital crowdfunding has brought the social process of entrepreneurship funding closer to everyone and made it more accessible. This insight supports the idea that new players can also turn to new sources of funding to complement conventional VC market investments. Specifically, in this study investor influence will act as a predictor for funding success, with more attention paid to an investor's technology, business model, and ethical choices.

2. Technological innovation

In the case of AI start-ups, technological innovation can be defined as a creation of socially useful, technologically advanced and sustainable AI solutions to a range of problems that meet legal requirements. Companies in the start-up stage which are considered to have a high level of technology, typically receive higher investment in order to change the market share and scale up [Filieri et al., 2021]. This includes the technical feasibility of the solutions, as well as their ethical and regulatory acceptability in specific sectors [Sloane, Zakrzewski, 2022].

For instance, [Kulkov, 2023] points out that presentation-focused AI start-ups that work in the healthcare sector using diagnostic tools and predictive

analytics attract more funding to meet the critical needs of the segment. According to [Schulte-Althoff et al., 2021], it also notes that entrepreneurs specialising in cross-sector applications such as fintech or renewable energy consistently receive more attention from investors than those focused strictly on a particular sector.

To this end, the technological innovation in this study will be assessed based on scalability, ethics, and legal compliance with AI solutions, since these factors are essential for decision-making by investors and overall success of the venture.

3. Ecosystem support

Ecosystem support involves incubation stations, innovation stations, accelerators, and all collaborative spaces in the development of AI start-ups. These ecosystems provide a source of infrastructure, guidance, connections, and access to capital, as described by [Bellina, Jungmann, 2023]. They also act as intermediaries between start-ups and investors, often increasing the odds of start-ups receiving funding.

[Schulte-Althoff et al., 2021] found that start-ups located in mature innovation clusters receive feedback from experienced coaches, have access to modern infrastructure, and are visible to potential investors. Similarly, [Filieri et al., 2021] have pointed out that ecosystem support not only improves the chances of start-up survival but also accelerates the journey towards the commercialisation of new solutions. [Prado, Bauer, 2022] note that ecosystems with guidelines and ethical leadership increase the appeal of start-ups to investors. Critical support for the structure of ecosystems for innovation has been addressed from various angles. [Rena, 2002] describes the issue of funding education and emphasises the importance of adequate mechanisms for cost recovery as a key factor in growth. Like any growing industry, innovation hubs and accelerators in the AI ecosystem help support the growth of future start-ups by offering resources for growth and supporting them correctly.

Ecosystem support will be seen as another essential factor in this study, with a focus on how collaborative environments improve funding availability and innovation outcomes for start-ups. These concepts are linked as follows: market and stakeholder pressures control the initiation of funding that goes to technological start-ups in ecosystems offering supportive resources and role models.

3. Critique and rationale

The decision to use a conceptual framework for this study is based on its ability to capture multiple viewpoints on the subject and respond to the complexities arising from the funding process of AI start-ups. While the theoretical framework remains loyal to a particular paradigm or theoretical theory, the conceptual framework combines ideas from different fields to create a comprehensive understanding of a complicated phenomenon [Maxwell, 2013].

From the perspective of this research, the funding environment for AI start-ups concerns the financial, technological, regulatory, and ethical aspects. These dimensions should not be thought of as existing in isolation from each other; a conceptual framework allows for a multiplicity of these dimensions, outside of which research on their interactions may be somewhat constricted. For example, [Schulte-Althoff et al., 2021] emphasise the significance of VC in the development of new AI-based technologies that can meet the needs of a growing number of users. This contribution emphasises the financial gains for investors who are interested in scalable and market-relevant start-ups. In contrast, [Sloane, Zakrzewski, 2022] focus on the ethical aspects of funding decisions, the rules governing such funding, and social responsibility in attracting funds.

Combining these perspectives through a conceptual framework offers several advantages:

1. Multidimensional understanding: Schulte-Althoff and co-authors argue that there are two perspectives on business sustainability, namely profitability and post-crisis business ethics. Sloane and Zakrzewski also note that this framework highlights two views of business sustainability: profitability and the post-crisis business ethics. This is important for understanding how and where monetary incentives meet and mix with social responsibilities among investors [Prado, Bauer, 2022].

2. Practical applicability: It is consistent with research findings on AI start-up funding to capture the multiple players, including investors, entrepreneurs, policymakers and innovation hubs among others. This makes it possible to present the study's findings in a way that is useful for 'practical' end-users of the information, both practitioners and policymakers [Bellina, Jungmann, 2023].

3. Dynamic adaptability: A conceptual framework can be adjusted to accommodate emerging trends and new knowledge, which is impossible with theoretical frameworks. For instance, since the study also takes into account recent changes in the ethical considerations of AI funding, the framework can adjust to these elements without disrupting its structure [Kulkov, 2023].

The selection of a conceptual framework is also based on the gaps that the chosen framework can fill within the literature review. This information can often be limited by its scope, as prior research has adapted individualistic approaches such as top-line financial indicators or ethical perspectives only. For example, [Filieri et al., 2021] focus on changes in funding activities by sector, noting the tourism sector, while [Rasiwala, Kohli, 2021] examine investment in the fintech sector. Synthesising

these various perspectives provides a holistic view of the funding ecosystem through the conceptual framework.

Furthermore, the conceptual framework supports the study goals and objectives in order to offer insights into funding mechanisms. It provides guidelines for policy makers on how to develop policy instruments that will incorporate both money and legal consequences. For investors, it emphasises the importance of integrating funding initiatives with priorities such as technologies and society [Huergo, López, 2022]. To begin with, it serves as a reminder of how entrepreneurial pitches should be designed and presented, especially within ethically and legally acceptable standard, to suit the tastes of investors, particularly for start-ups.

4. Methodology, research design and approach

This study therefore employs a mixed-method research approach to achieve a detailed understanding of the funding processes for external AI start-ups, with a focus on investor choice, technology development and support systems. The use of mixed methods is useful because it combines quantitative and qualitative approaches, from which rich quantitative and qualitative data can be obtained. The study also utilises concepts from [Paul, Rena, 2024] on funding new AI startups through the assessment of digital platforms. By expanding the sample size of the research, the study raises questions about the efficiency of these platforms in terms of funding availability – as a source beyond venture capital, grants and government funding frameworks.

Qualitative research designs used in this study include an explanatory sequential design, whereby quantitative data is analyzed first for propensity, and then qualitative data is analysed to provide an explanation of the recognised propensities [Tashakkori, Teddlie, 2009]. This approach helps to combine the quantitative analysis results with qualitative views to provide a holistic view of different funding ecosystems.

The following data collection methods were used:

1. Quantitative data collection

Quantitative data will be sourced from reputable databases, including:

Furthermore, the financial data for investments have been sourced from Crunchbase, PitchBook, and DealRoom, along with startup-related financial indicators, which include funds raised, investor type, and start-up performance.

Trade journals and references are used for cross-sectoral funding analysis and technological advancements.

Half a million dollars will be allocated to a current dataset of AI start-ups funded between 2019 and 2024. Key variables will include:

– stages of financing or capital increases (seed, A, etc.);
– investors (venture capitalists, Angel investors, government funding);
– ethical, technological, and range elements (ethical, scalabilities, regulatory).

2. Qualitative data collection

Qualitative insights will be gathered through:

These are interviews and focus group discussions with key informants, including start-up founders, individual and institutional investors, as well as managers and staff from innovation hubs. The aim of these interviews is to determine investor preferences, technological needs, and support systems for the ecosystem.

Starting with a review of case studies of established and failed AI start-ups, each selected based on specific contextual characteristics in an effort to identify components that affect funding decisions.

Data analysis methods include

1. Quantitative analysis

Methods: methods of statistical analysis will be used to discover correlations and patterns in the data. Tools include:

We will also use descriptive statistics to describe some of the important variables.

T-tests were used to compare levels of preference and technological importance among samples of investors, both those who were successfully funded and those who weren't.

Software: M, STATA, and Python with supported libraries such as Pandas, Num, and Scikit.

2. Qualitative analysis

Qualitative data will be analysed using:

They identified themes through integrative interviews and case studies of stakeholders.

Since the study adopted interviews and secondary data, content analysis was used to code the findings from interviews, and a comparison was made with secondary data to identify other insights that might have emerged.

Software: NVivo or Atlas. ti to code and regulate the qualitative data.

Validation and reliability

Triangulation: The choice to use both quantitative and qualitative approaches means that the data is already triangulated in order to increase the reliability and validity of the findings [Denzin, 2012].

Data verification: Quantitative data will be collected using various databases such as (Crunchbase & Pitchbook) and qualitative data will be verified through respondent validation (member checking).

The study adheres to ethical research principles by:

– forming consent with the interview participants;
– ensuring the anonymity of all the respondents and the cases used in the survey;
– employing secondary data in accordance with the rules set out in regulatory policies on data sharing.

Such an approach is valid as it combines quantitative and qualitative methods, since the research question is multifaceted and complex. Quantitative studies provide general knowledge patterns, while qualitative methods provide detailed information and contextual insight; [Creswell, 2014]; They complement each other, with the former providing broad results and the latter explaining the gaps left by much literature that relies on numbers and case studies. This integrative approach allows for a more comprehensive and inclusive understanding of the funding of AI start-ups.

5. Results and discussion

5.1. Results

Funding patterns of over 500 AI start-ups for the timeframe of 2019 – 2024 were examined through quantitative data collection and set against a qualitative backdrop of interviews. The findings are organized around three key themes: the purpose of this paper is to reveal such factors as investor influence, technological innovation, and ecosystem support.

1. Investor influence

The quantitative study showed that specific investors' choice had an impact on the fund receipt rates. AI business start-ups with economically reproducible technologies and well-defined business models were favored by the investors. Specifically:

- Big area of AI technologies, for which investors were keen included generative AI and predictive analysis [Schulte-Althoff et al., 2021; Kulkov, 2023];
- Namely, start-ups that have claimed previous rounds and a partnership with a mature company received larger funding [Prado, Bauer, 2022];
- Ethical concerns have put pressure on some financiers, especially in the healthcare and fintech sectors, where meeting ethical AI standards increased the possibility of receiving funding [Sloane, Zakrzewski, 2022].

In this regard, Paul and Rena argue that innovation in crowdfunding and other digital funding platforms makes AI funding a more viable option for AI start-ups. Consequently, this research shows that these platforms not only complement the initial access to funds but also provide support from peers for start-up undertakings. During more descriptive interviews, investor knowledge emerged as the critical factor. Entrepreneurs highlighted the occasions when investors provided valuable lessons and insights that helped them better adapt their value propositions to market developments.

2. Technological innovation

Start-ups with innovative and compliant AI technologies have consistently been favoured:

Ideas for solving a current social problems, such as in healthcare diagnostics or renewable energy, have been more successful in attracting funding [Filieri et al., 2021; Kulkov, 2023].

Of similar importance was scalability; those technologies that could cross over between sectors received higher funding [Schulte-Althoff et al., 2021].

Data privacy and algorithmic transparency have become other no-go areas for many investors due to increasing regulations in many parts of the world, particularly in the EU. [Rena, 2006] was also concerned about how technology could lead to change and help resolve system-related problems, and this opinion complements the research findings in the method used in this study, which explores how innovative AI solutions can be used to attract investment. Small companies that provide solutions for multiple industries, such as healthcare and green energy, align with this developmental vision.

3. Ecosystem support

Innovation hubs and accelerators have played a pivotal role in enhancing start-up visibility and operational efficiency:

Firms backed by leading incubators or operating from emerging hubs such as Silicon Valley or Berlin were about 40 % more likely to receive funding [Bellina, Jungmann, 2023].

These ecosystems provide networking opportunities, technical support, and visibility for investors [Filieri et al., 2021].

Topical examples showed that accelerators mediate between start-ups and authorities to ensure compliance with regulations and attract investors (see [Prado, Bauer, 2022]). The significance of ecosystem support has been emphasised by [Rena, 2002], who describes how a structured system leads to sustainable growth in education. Similarly, the role of innovation hubs in the AI start-up ecosystem emphasises the importance of infrastructure and mentorship for improving funding.

5.2. Discussion

The results of the current study are consistent with and contribute additional insights to the existing AI start-up funding research. Our findings encompass investor behaviour, technology advancement, and ecosystem factors that define funding trends.

1. Money power and management decisions

The demand for large-scale and equitable AI solutions is understandable in light of the changing focus of investors, who are gradually moving away from the exclusivity of the opportunities to generate money in favour of creating fair and legal products. This is supported by the research done by [Schulte-Althoff et al., 2021; Sloane, Zakrzewski, 2022], as the importance of accountability in innovation continues to grow. However, this study also shows that investors lack knowledge in

some of these new AI areas, meaning that they have work to do in engaging with start-ups.

2. Technological innovation: The staff's responsibility

Technological differentiation is still an essential ingredient for funding. Organisations that focus on conveying their value proposition through social advancements and compliance with industry laws achieve asignificant consumer loyalty in a cumulative outcome. Similarly, [Kulkov, 2023] pointed out the importance of sectoral innovation, and [Filieri et al., 2021] noted that recognising industry-specific issues adds value. Compliance focus has provided an important opportunity for start-ups to adopt and implement ethical AI guidelines during the development stages.

3. The second and final element, or domain, is ecosystem support as an enabler

The availability of innovation hubs and accelerators shows that competitive advantages depend greatly on ecosystem support, as regards funding. This agrees with [Bellina, Jungmann, 2023] who use the term 'partnership models' to link start-ups with funding, expertise and capital sources… Nevertheless, the level of access to these ecosystems varies significantly, and in countries where it is less developed, such as many emerging markets, this poses a challenge that policymakers and global incubators need to address.

Use of the TIP and the pragmatic approach: Explanations for findings, concluding thoughts, and recommendations for practice. Implications for policy.

For start-ups: The approaches to funding should reflect scalability, compliance, and socially responsible funding. One advantage of interacting with innovation hubs is that it can increase the profile and readiness of organisations.

For investors: Other areas that can help achieve a good return on investment include increasing knowledge in AI-related domains and partnering with start-ups.

For policymakers: A lack of such policies can be addressed by introducing policies that support the ethical development of AI, as well as setting up innovation hubs in areas that are not yet well-developed.

Conclusion

Thus, this work aimed to identify funding trends in AI start-ups, to study entrepreneurial, investors, technology and ecosystem interactions. The identified factors included integrated solutions that could be scaled, were ethical, regulatory compliant, and were significant determinants of funding. Investor experience and support from the ecosystem were also noted as significant for determining the likelihood of success. Venture capital was the most popular form of funding, and the trend towards investing in solutions to social problems such as health and energy was evident.

Furthermore, there are ethical concerns and compliance requirements that are equal in importance to funding and, thus, are an essential factor in the success of funding. The role of developing responsible AI has emerged. Related innovative structures, defined as innovation hubs and accelerators, have emerged as central to driving this innovation process by offering strategic resources, knowledge, and connections to capital sources. However, accessibility to such ecosystems remains a concern, and this indicates that inclusive policy interventions are needed.

Practical implications

– for start-ups:

This study builds on the insights proposed by [Paul, Rena, 2024] about the democratisation of funding through digital platforms and recommends incorporating them into more traditional funding environments for AI start-ups. Additionally, the study shares another important aspect with [Rena, 2006; 2009] regarding the implications of entrepreneurship and innovation for development. Thus, it is important to emphasise scalability, compliance, and relevance to society when considering funding applications.

Technological and financial hubs will enhance the visibility and preparedness of engagement in innovation.

Applying ethical AI principles proactively is a way for start-ups to stand out in a crowded funding environment.

– for investors:

The expansion of the understanding of new AI markets and the development of cooperation with start-ups may improve the results of investments.

Potential benefits of implementing ethical considerations in investment procedures involve addressing risks and complying with new regulations.

– for policymakers:

The regional disparities to call can be mitigated by creating policies that would promote ethical development and support innovation clusters.

Grants, subsidies and public-private partnership schemes can significantly stimulate the start-up development in niches that lack such actors.

Theoretical implications. This work enriches research in the field by synthesising multiple paradigms into a single theoretical model that demonstrates the relationship between financial, technological, and regulatory factors. It adds to previous literature by offering survey data on investor preferences and funding ecosystem support within the context of P2B lending.

Future scope of the study.

Exploration of emerging markets. There is potential literature where future studies could attempt to consider funding activities in emerging countries based on the factors that make AI start-ups suitable for these markets exclusively.

Longitudinal studies. Such longitudinal studies might help to understand how funding dynamics evolve as AI start-ups grow and transition to other phases of venture development. Based on the findings of [Paul, Rena, 2024], future studies might explore the opportunities offered by digital crowdfunding platforms in emerging markets. Additionally, systemic implications of [Rena, 2002; 2006] suggest that future research could investigate how learning and economic systems might be modified in order to promote international AI development.

Sector-specific analysis. More works could explore geographical differences in funding. It could look at venture capital funding for biotechnology or AI in finance, and renewable energy, to name a few areas.

Impact of ethical AI policies. It would be useful to understand how start-up founders and investors plan for and respond to new and changing ethical AI policies to allocate funding.

Integration of alternative funding mechanisms. Subsequent research might also explore how funding sources, such as crowdfunding and ICOs, or partnerships, might augment or replace venture capital.

AI-powered funding decision models. As the use of AI continues to drive decision-making, researchers might consider the existence of AI algorithms for assessing start-up viability and guiding funding.

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Reducing risks when creating IT products: Developing integrity criteria for IT entities

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Abstract
The article examines the nature and essence of conscientious behavior of IT-entities that are willing to guarantee the production of high-quality IT-products within the framework of projects, as well as minimizing the likelihood of undesirable consequences for all participants and other interested parties. To achieve this goal, the article analyzes the signs of good faith and unfair behavior of parties involved in relationships, including judicial practice related to protecting rights from unfair conduct of counterparties. Based on this research, criteria were formulated for the integrity of IT-entities, such as the absence of intention to cause material harm to interested parties, and the existence of an effective risk management system. It was discovered that the intention to harm is characterized not only by the current behavior of IT-companies (including clearly burdensome terms in contracts, deliberate violation of current legislation, use of the incompetence of transaction participants for their own benefit, etc.), but also by unfair actions committed in previous transactions. It was also discovered that responsibility for taking preventive measures to reduce risks is assigned to parties undertaking work on producing an IT-product. In particular, research has shown that, if IT-companies do not proactively influence companies in advance before entering into agreements, there will be no universal risks, but during the performance of work, parties may face compliance consequences that could negatively affect project goals and lead to significant material losses for these parties.
Keywords: IT-product, IT-project, risk

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IT产品创建中的风险降低：IT实体诚信标准的形成

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简介
本文探讨了信息技术主体诚信行为的本质和性质，这些主体随时准备保证在信息技术项目框架内创造高质量的信息技术产品，并将对所有关系参与者和其他利益相关者造成不良合规后果的可能性降至最低值。为了实现既定目标，本文作者分析了关系参与者善意和恶意行为的迹象，包括研究与保护权利免受对方恶意行为侵害有关的法院实践。在研究的基础上，制定了信息技术主体诚信的标准，即不存在对利益相关者造成重大损害的意图，以及存在切实有效的风险管理系统。研究发现，造成损害的意图不仅体现在信息技术主体当前的行为上（在合同中加入明显苛刻的条款、故意违反现行法律、利用交易参与者的无能损害自己的利益等），还体现在他们之前在过去的交易中实施的不公平行为上。研究还发现，实施预防性风险缓解措施的责任在于承诺执行工作以创建 IT 产品的一方。特别是，研究发现，如果 IT 利益相关方在签订合同之前不积极主动地应对 105 项普遍风险，那么在工作执行过程中，利益相关方极有可能遇到合规后果，从而对实现项目目标的进程产生负面影响，并给这些当事方造成重大的物质损失。
关键词: 信息技术产品、信息技术项目、风险

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Introduction

According to the Resolution of the Plenum of the Supreme Arbitration Court of the Russian Federation dated October 12, 2006, No. 53[1] (hereinafter referred to as Resolution No. 53), business entities are required to exercise due diligence when concluding contracts, i.e., take steps to verify the reliability and integrity of potential and current counterparts. If they fail to do so, they risk entering into relationships with unreliable and unscrupulous counterparts who will not fulfill their obligations or create products with defects.

It should be noted that the legislator considers a deficiency in the results of work performed (services rendered, goods delivered) to be any non-compliance with mandatory requirements of regulatory acts, national standards, contracts, etc. [Gayazov, 2022]. For example, if a product does not meet the stated requirements, it becomes low-quality and may entail negative consequences for both the contractor and the customer [Nikolaenko, 2024b]. In particular, if it is established by virtue of Article 475 of the Civil Code of the Russian Federation[2] that significant costs are required to eliminate defects or their nature is such that defects are discovered repeatedly, the customer (buyer) may refuse to perform the contract and demand a refund of money previously paid [Mikhailenko, Kovaleva, 2021].

In this article, IT entities are understood as business entities (OKVED class 62) engaging in the development of IT products and providing consulting services in this field [Nikolaenko, 2024a]. According to the PMBOK® Guide[3], a project is a unique process aimed at creating a product and/or providing a service under conditions where resources are limited and deadlines are strictly defined. In this regard, an IT project is a specific process aimed at developing an IT product (hereinafter referred to as 'the product') in the field of information technology under conditions of limited resources and strict deadlines.

It should be noted that, in addition to financial and reputational losses expressed in violation of deadlines for the performance of work, the delivery of incomplete or low-quality goods, and the payment of penalties and fines, business entities may face more serious consequences for compliance [Nikolaenko, 2024c]. In particular, if the tax authorities establish that a business has entered into a contract with a counterparty for one day, then sanctions may be imposed on that business in the form of refusal to refund VAT, additional interest on taxes, etc. [Neustupova, Kuzmina, 2019].

As an example of sanctions against a business entity for entering into a contract with a dishonest taxpayer, the ruling of the Federal Antimonopoly Service (FAS) of March 15, 2011, in case No. A65-15788/2010, should be cited[4]. According to the case materials, the applicant asked the court to declare the decision to charge income tax in an amount of 827 thousand rubles and VAT in an additional amount of 620 thousand rubles illegal, as well as to impose a fine under paragraph 1 of Article 122 of the Tax Code of the Russian Federation[5] in the amount of 264 thousand rubles for failure to pay taxes.

Another example is the ruling of the FAS VVO dated 28.01.2011 No. F01-4843/2010 in case No. A29-3615/2010[6]. The applicant asked the court to annul the tax authority's decision to collect RUB 2.9 million in income tax and RUB 2,2 million in VAT.

According to the ruling of the FAS WSO dated 29.03.2011, in case No. A27-9150/2010[7] the applicant requested the court to annul the decision of the tax authorities regarding the additional assessment of UTII amounting to 328.8 thousand rubles, penalties amounting to 113.7 thousand rubles and a fine amounting to 43.3 thousand rubles as well as a single tax amounting to another 459 thousand and penalties amounting again to 122.2 thousand and fines amounting once again to a total of 81.5 thousand.

Despite the urgent need to conclude contracts with reliable, mature and conscientious counterparts, Resolution No. 53 does not formalize any approaches or methods for their verification. Instead, it suggests that business entities should independently develop methods for researching counterparts within the framework of their own internal control systems [Murnikov et al., 2019]. For example, in the work by [Vostrenkov and Sanina, 2024], it is noted that entities are often forced to create separate specialised units in order to protect their economic security. These units take on the function of mitigating the risks associated with concluding contracts with unreliable counterparts and serious compliance consequences that may arise due to their actions. It should be noted

[1] https://clck.ru/3Fkgje.
[2] The Civil Code of the Russian Federation (Civil Code of the Russian Federation). Comment on the latest changes (2019). Moscow, ABAK.
[3] Project management body of knowledge. Guide 6th edition (PMBOK-6) (2017). Project Management Institute (PMI).
[4] https://clck.ru/3FpteD.
[5] https://clck.ru/3LyHqB.
[6] https://clck.ru/3FpxEe.
[7] https://clck.ru/3FpxGo.

that risk is understood in GOST R ISO 31000[8] as a probable event that, when it occurs, may affect the achievement of goals.

Based on the above, it is logical to assume that the verification of counterparties and the assessment of their reliability, maturity, and integrity should be an integral part of the pre-contractual work of a business entity [Tuktarova et al., 2023]. In this regard, in order to improve the mechanism for verifying the reliability of IT entities capable of creating high-quality IT products within the framework of IT projects (sprints, life cycle phases, contracts, etc.), it is necessary to define criteria for the integrity of these entities.

To achieve the stated goal, the author of the article solved the following tasks:

- signs of conscientious and dishonest behaviour of participants in relationships have been identified.
- criteria for the conscientiousness of IT entities have been formalised.

1. Signs of good faith and bad faith behaviour

An analysis of the current legislation has shown that the basis for fruitful and mutually beneficial relations between stakeholders involved in creating IT products within the framework of IT projects is their good faith (Article 10 of the Civil Code of the Russian Federation). For this reason, the verification of an IT entity's ability to create the desired IT product must begin with verifying its good faith regardless of any presumption declared by the lawmaker. According to the presumption of good faith, anyone must be considered to be acting in good faith until proven otherwise by a competent authority. The legal definition of the presumption is given in Article 302 of the Civil Code of the Russian Federation.

Current legislation defines good faith as a principle of civil law, which requires participants in relationships to take into account each other's rights and interests (Article 1 of the Civil Code of the Russian Federation). This principle imposes two functions on participants: the first is aimed at building fruitful and mutually beneficial relationships between interested parties; the second is aimed at establishing legal boundaries and moral restrictions. [Koshurin, 2024].

The legislator declares that the parties to the relationship must conduct bona fide activities and perform bona fide actions towards each other. In particular, by virtue of paragraph 2 of Article 434.1 of the Civil Code of the Russian Federation, the parties to the relationship are obliged to act in good faith. This means that, for example, during negotiations, performance of work, provision of services, delivery of goods and fulfillment of other obligations, the parties to the relationship have no right to deviate from bona fide behaviour (paragraph 3 of Article 432 of the Civil Code of the Russian Federation) [Nazarova, 2022]. The good faith behaviour of stakeholders is the key to stability, sustainability, and predictability in their relations.

It is worth noting that the current legislation does not provide an unambiguous definition of the concept of 'good faith'. This is the cause of numerous discussions, for example, A.A. Nikolaev defines good faith in [Nikolaev, 2022] as an imperative rule for the conduct of participants in relations, which regulates the balance of rights and obligations and establishes boundaries for their activities. In the work of D.N. Revina, conscientiousness is characterised as a criterion for assessing the behaviour of a person in a relationship [Revina, 2019]. Strengthening this point of view, V.V. Koshurin adds that the legislator does not establish a list of criteria to assess the counterparty's good faith. Instead, it formalises signs by which the good faith or bad faith of the party can be determined. [Koshurin, 2024]. Thus, according to Resolution No. 25 of the Plenary Session of the Supreme Court on 23 June 2015 (hereinafter referred to as Resolution No.25), conduct is considered to be good faith if certain signs are present in the actions of a counterparty. For example, behaviour by a counterparty is considered bona fide when[9]:

- the rights and legitimate interests of the other party are taken into account;
- assistance is provided to the other party, including helping them obtain information necessary for performing work, providing services, delivering goods, and fulfilling other obligations(Clause 3 of Article 307 of the Civil Code of the Russian Federation).
- measures are taken to prevent events that may harm other parties, including warning them about additional actions that are not specified in the contract and may affect the quality of the final result.

When a person who has entered into a relationship has the intent to cause harm and (or) abuses his/her right to the detriment of another person (Clause 1 of Article 10 of the Civil Code of the Russian Federation),

[8] GOST R ISO 31000-2019. Risk management. Principles and Guidelines (2020). Moscow, Standartinform.
[9] https://clck.ru/3EakXG.

such behaviour is considered unfair. Signs of unfair behaviour may include the actions of the counterparty when:

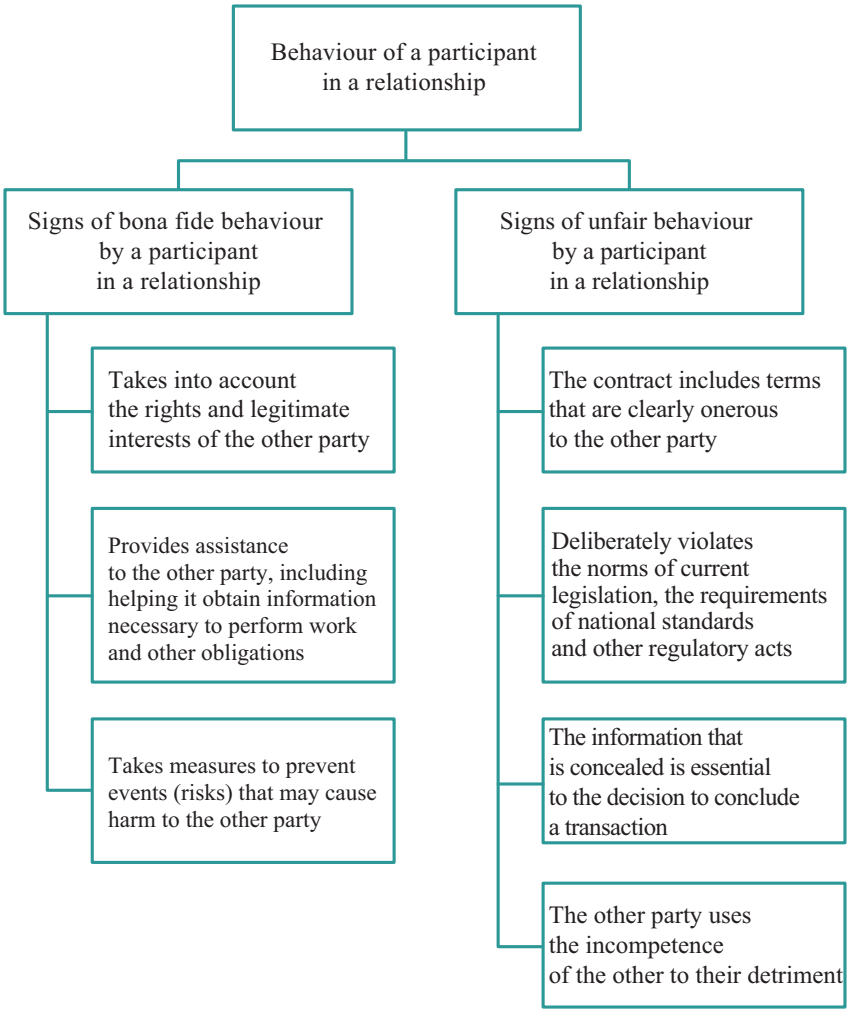
- the contract includes terms that are clearly onerous to the other party;
- the norms of current legislation, requirements of national standards and other regulations are deliberately violates;
- the information on which the decision to conclude a transaction depends is deliberately hidden;
- the incompetence of the other party is used to its detriment.

It is important to emphasise that, in order to recognise someone's actions as unfair, it must be proved that they had the intention to cause harm to another person. Additionally, the abuse of rights should be sufficiently obvious, and the decision about it should not be based on assumptions. For this reason, recognising actions as unfair is within the jurisdiction of the court [Ryzhikh, 2020]. In the work of M.G. Nazarov [Nazarov, 2022], it is emphasised separately that the dual nature of good faith - formal and moral - gives the court freedom to determine the qualification of actions committed.

Signs of bona fide and unfair behaviour are shown in the figure.

The complexity of checking the integrity of potential and current counterparts is noted in E.E. Bogdanova's work [Bogdanova, 2016]. According to the author, the complexity of the check is due to the system of ideas about the moral behavior of participants in civil legal relations that has developed in society. In her study, Bogdanova concludes that during the analysis of activities of counterparties, it is necessary to evaluate their morality, in particular, using the concepts of good and evil.

Fig. Signs of bona fide and unfair behaviour of participants in relationships



Source: compiled by the author.

According to the requirements of the Federal Law 'On the contract system in the sphere of procurement of goods, works, services to meet state and municipal needs' No. 44-FZ (hereinafter - Law No. 44-FZ)[10], good faith is one of the key qualities that influence the decision to enter into a contract for purchasing goods, works or services to meet state or municipal needs. Specifically, a prospective contractor must have successfully completed at least three projects within three years preceding the date of submission of an application.

Unfair conduct by one party to a relationship can lead to serious compliance consequences. For instance, current legislation provides for the following means of protection against unfair behaviour (estoppel):

- a counterparty who abuses their right may be denied the protection of this right (Clause 2 of Article 10 of the Civil Code of the Russian Federation).
- a transaction that was concluded in abuse of rights can be declared invalid (Clause 5 of Article 166 of the Civil Code of the Russian Federation) [Chernyatkin, 2018]. If a statement of invalidity of the transaction comes from a dishonest counterparty, then such statement has no legal force.
- if a counterparty has abused its rights and caused harm and material damage to another party, then that party acquires the right to recover damages (Clause 4 of Article 10 of the Civil Code of the Russian Federation) [Filippova, Zharkenova, 2018];
- if a counterparty who benefits from the occurrence of a certain condition in the transaction acts in bad faith to materialize that condition, it may be recognised as having not occurred (Clause 3 of Article 157 of the Civil Code of the Russian Federation).
- if a contract is aimed at meeting state (municipal) needs, then a person may be included in the register of unscrupulous contracting organisations [Zhukov, 2021].

An example of unfair behaviour is the case No. A60-46975/2016[11], in which an IT subject used developments of a previously created IT product that it was not the copyright holder for, and created a derivative work based on it (Article 1270 of the Civil Code of the Russian Federation). In order to recognise the unfairness of this behavior, the court appointed an expert. The expert's opinion stated that the vast majority of functional blocks, connections, and logical operations were identical in the original and derivative works.

Another example of unfair behaviour by an IT entity is case No. A40-202764/2018[12]. During the trial, it was established that the IT company attempted to unfairly appropriate exclusive rights to the results of intellectual activity and copyright objects of its former employees. In particular, the company took steps to cancel the state registration certificate for the computer program, issued by Rospatent. This document stated that the former employees were the authors and copyright holders of the product in question.

In studying the problem of unfair behaviour by participants in relationships, O.E. Zhulyeva concludes that in order to mitigate these problems, individuals should provide a 'guarantee of good faith' or include additional clauses in the contract [Zhulyeva, 2024]. According to Zhulyeva, these contracts should contain information confirming the official and tax status of participants in civil transactions, the availability of resources to fulfil obligations, as well as willingness to interact with regulatory authorities.

According to the author, Zhulyeva's position as set out in his work requires clarification. In particular, according to Federal Law No. 44-FZ, the legal and tax status of procurement participants is a criterion for their reliability, rather than good faith. As per GOST 27.002[13] reliability is an object's ability to perform specified functions within specified operational limits over a given period of time. In economic relations between entities, 'reliability' can be understood as a characteristic of their financial and economic activities system.

V.V. Koshurin, after analysing judicial practice, concluded that the method for verifying the good faith of a party is to analyse court decisions involving it [Koshurin, 2024]. He argues that verification of information about a counterparty should be carried out by studying their title documents, and when analyzing judicial practice, attention should be focused on the motives and actions taken by the counterparty during the dispute.

[10] https://clck.ru/Nh6GG.
[11] https://clck.ru/3EbpVs.
[12] https://clck.ru/3EbodH.
[13] GOST 27.002-2015. Reliability in technology. Terms and definitions (2016). Moscow, Standartinform.

2. Criteria of good faith

Based on the above, the author of this article believes that the main criteria for the integrity of IT entities should be:

1. Absence of intent to cause material damage or other harm to interested parties. The presence of such intent is characterised not only by the current behaviour of the IT subject (inclusion of clearly onerous conditions in the contract, deliberate violation of the norms of current legislation, use of the incompetence of the participants in the transaction to their detriment, etc.), but also by unfair actions that it has previously committed in past transactions. It is logical to assume that one way to check the intent to cause material damage or other harm to interested parties is by checking contracts for the presence of clearly onerous terms, as well as analysing judicial practice and decisions of supervisory bodies.

2. Availability of an effective and efficient risk management system (hereinafter referred to as RMS). According to current legislation, responsibility for implementing preventive measures to mitigate risks is assigned to the contractor (Chapter 37 and 39 of the Civil Code of the Russian Federation). If the contractor does not assess risks in advance before concluding a contract and does not proactively influence them, there is a high probability that during the execution of the work, the parties to the transaction will encounter events that negatively affect the achievement of project goals, causing material damage or other harm. Therefore, the presence of RMS should be a legal criterion for establishing the integrity of an IT company. It should be noted that, according to the standard GOST R ISO/IEC 33001[14] effectiveness is defined as the degree of implementation of preventive measures and achievement of planned results. In accordance with GOST ISO 9000[15] efficiency should be understood as the ratio between the achieved result and the resources used.

A study conducted within the framework of the research grant of the Russian Foundation for Basic Research No. 16-36-00031 'mol_a' in 495 IT entities of the Tomsk region (OKVED class 62) made it possible to establish that during the creation of IT products, about 105 universal risks can materialize, of which 5 are commercial, 45 are compliance risks and 55 are project risks [Nikolaenko, Sidorov, 2023]. Universal risks are understood as probable events that are relevant to IT projects (sprints, life cycle phases, contracts, etc.), regardless of their scale, complexity, duration (short-term, medium-term, long-term), type (software, mobile application, IS, etc.) or concept for creating IT products (Waterfall, Agile) [Paladino et al., 2009; Aven, 2012; Brandas et al., 2012; Lee, Baby, 2013; De Bakker et al., 2014; Mishra et al., 2014; Beer et al., 2015; Luckmann, 2015].

Commercial risks are understood as any potential threats that may prevent customers and other interested parties from benefiting from the use of the IT product. For example, unwanted derivative works, piracy, and other risks. Despite their small share in total risk (4.7%), one commercial risk could level out all resources and efforts spent, causing catastrophic damage to interested parties.

Compliance risks are understood as probable events related to the violation of the norms of current legislation, requirements of national standards and codes of conduct. A characteristic feature of compliance risks is legal consequences, expressed in sanctions from regulatory and supervisory authorities, industry associations, as well as individuals whose rights and interests have been violated.

Project risks are risks that affect one project's objective or combination of objectives. These risks typically materialize during the 'Creation of an IT Product' phase of the IT project lifecycle due to actions (or inactions) by the project manager, system analyst, legal counsel, subcontractor, and other project participants [Nikolaenko, 2025].

In light of the above, the following conclusions can be made. If IT entities intend to ensure the creation of high-quality IT products and reduce the probability of undesirable consequences for all parties involved in the relationship, they must mitigate 105 risks. The preventive elimination of these risks can serve as a quantitative and qualitative indicator that these entities have effective and efficient risk management systems in place. Since their actions indicate good faith behaviour towards preventing harm to interested parties, it may indicate their trustworthiness.

Conclusion

Thus, it can be concluded that if business entities intend to enter into contracts for the creation of IT products, they need to carry out a due diligence examination in order to ensure that there is no intent to cause material damage or other harm to stakeholders, and that there is an effective and efficient risk management system (RMS). As noted

[14] GOST R ISO/IEC 33001-2017. Information technology. Evaluation of the process. Concepts and terminology (2017). Moscow, Standartinform.
[15] GOST ISO 9000-2011. Quality management systems. Basic provisions and vocabulary (2020). Moscow, Standartinform.

earlier, compliance with these criteria increases the chances of successfully concluding contracts with IT entities who can ensure the creation of high-quality products within IT projects without undesirable consequences.

It is worth noting that the increase in the probability of successful creation of IT products is based on the mechanism of mitigating universal risks. The results of the study show that if IT companies do not assess these risks before entering into contracts and do not proactively influence them, there is a high probability that during the course of work they and the parties involved will encounter events that negatively affect the achievement of project goals.

In further studies, it will be necessary to analyse the mechanism for assessing the maturity of IT entities, as it is the high level of maturity that shows how well and effectively these entities take action to prevent events (risks) that could harm stakeholders. Based on this, it is necessary to examine in more detail existing methods for determining the level of maturity for entities engaged in computer software development and consulting services in this field (OKVED Class 62).

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Formation of a regional economic development strategy in modern conditions: Challenges and prospects

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Abstract

The growing independence of the Russian regions, vesting them with a wide range of powers on various issues determines the relevance of the study of regional economic systems. Like the world economy, the regional economy is currently undergoing transformation of some aspects due to global technological and geopolitical changes.

The purpose of the study is to analyse and summarise the current approaches to the formation and implementation of regional economic policy by the authorities of the Russian regions, to assess the current challenges and prospects for further improvement of regional economic policy. Within the scope of the work the modern tools of regional economic policy implementation are characterised, the methods of combating actual challenges, including economic sanctions, are considered on specific examples, the sample analysis of the main economic indicators of the regions of different federal districts is carried out, the conclusion about the stable position of the economies of the Russian regions is made, the assessment of the subsequent prospects for the improvement of regional economic policy is given, the problems for further research are proposed.

The results and conclusions obtained in the work can be applied in the practical implementation of measures for the formation and implementation of regional economic policy. The results of the work are original and are based on the most relevant theoretical approaches, practical developments and statistical data, therefore they have high scientific and practical significance.

Keywords: regional economy, regional economic policy, regional governance, regional development, economic security, strategic planning

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现代条件下区域经济发展战略的形成：挑战与前景

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简介

俄罗斯各地区日益独立，在各种问题上拥有广泛的权力，这决定了研究地区经济体系具有现实意义。与世界经济一样，由于全球技术和地缘政治的变化，地区经济的某些方面也正在发生变化。

本研究旨在分析和总结俄罗斯联邦各主体当局目前制定和实施地区经济政策的方法，评估当前面临的挑战和进一步完善地区经济政策的前景。

在工作框架内，介绍了实施地区经济政策的现代工具的特点，根据具体实例考虑了应对当前挑战（包括经济制裁）的方法，对不同联邦区各地区的主要经济指标进行了抽样分析，对俄罗斯联邦各主体经济的稳定状况做出了结论，对改进地区经济政策的后续前景进行了评估，并提出了进一步研究的问题。

工作中获得的成果和结论可应用于制定和实施地区经济政策措施的实际执行中。工作成果具有独创性，以最相关的理论方法、实践发展和统计数据为基础，因此具有很高的科学和实践意义。

关键词： 区域经济、区域治理、区域发展、经济安全、战略规划

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Introduction

The growth of regional autonomy is associated with the spread of the principle of subsidiarity. This principle states that, where possible, problems or tasks should be solved at a local level. As a result, a number of powers have been delegated from the federal government to regional governments, including in economic policy.

Modern regional economic policy is formed under the influence of several multi-directional factors at once: economic turbulence, geopolitical changes, changes in the system of inter-budgetary relations, as well as increasing socio-economic and infrastructural differentiation between regions.

Through regional policy measures, the state solves various regional problems, such as high levels of socio-economic differentiation, a shortage of certain resources and the depressed state of individual regions. Economic policy comes to the rescue when there is a need to stimulate economic processes through limited government intervention. Modern economic policy is characterised by the use of more flexible, regulatory instruments to develop the internal potential of regions, taking into account their unique characteristics compared to Soviet times, when economic policy often involved crude interventionism [Limonov, 2025].

The research methods used included a systems approach, synthesis, classification, statistical analysis, and other general scientific methods of cognition. Current regulatory documents on the topic were also studied.

1. Current methods of implementing regional economic strategy

The formation and implementation of regional economic policy presupposes active use of various tools and mechanisms based on strategic priorities for regional development. Instruments of state economic development regulation are usually divided into direct and indirect in scientific literature; this classification is also suitable for methods used in regional economic policies (Table 1).

In this case, it is necessary to distinguish between the regional economic policy pursued by federal authorities and their territorial divisions in specific regions and the policy implemented directly by the authorities of the constituent entities of the Russian Federation. This paper uses the term ‘regional economic policy’, which is based on the definition by L.E. Limonov. According to him, regional economic policy refers to the conscious regulatory impact of regional governments on the economy, carried out within a certain framework to achieve goals that are consistent with the interests of the people in the region [Limonov, 2025].

In accordance with this distinction, it is possible to divide instruments of regulatory influence into macro- and micro-instruments. The former are reflected in trade, budgetary-tax and credit-monetary policies conducted at the federal level; the latter are more often applied at the regional level and consist of influencing labour and capital.

The German economist, G. Spehl, proposed a clear classification of regional economic policy instruments based on the object of influence (see Table 2).

At present, when implementing regional economic policy, more attention is paid to endogenous factors such as the internal human resources potential of the region and the quality of the institutional environment. These factors form the value foundations for the development of regional communities, and at the same time it is a priority to improve the quality of life for people living in the regions. This presupposes focusing on ensuring a balance of interests for many participants in socio-economic relations, including economic entities, public

Table 1
The ways in which states regulate economic development

Direct methods	Indirect methods
State investments in priority areas of regional development	Regulation of regional tax and fee rates, including provision of tax incentives
Quotas and licensing of foreign trade activities of economic entities	State lending, providing for the possibility of obtaining preferential loans
Subsidies and grants aimed at supporting individual regions and industries	Creation of target and special extra-budgetary funds
Placement of state orders	Establishment and regulation of customs duties
Establishment of regional tariffs for certain goods and services	Implementation of accelerated depreciation policy

Source: compiled by the authors.

Table 2
Directions of regional economic policy,
depending on the area of influence

Object of influence	Contents of the policy instrument
Economic environment	Creating a favorable business climate based on local prerequisites
Capital	Attracting external investment, mobilising existing capital
Labor	Training and upgrading the skills of the local workforce
Innovation	Creating and supporting research centers and higher education institutions
Communications	Developing and improving the reliability of communication networks
Technology	Creating and supporting institutions that develop technologies and carry out technological cooperation
Local areas	Comprehensive renewal of territorial zones
Enterprises	Supporting small and medium-sized businesses, creating conditions for the emergence of new enterprises

Source: [Mayer, Spehl, 1993].

organisations and political parties.

In turn, any regional economic policy is based on available regional resources (human, social, economic, and natural). Given the increasing competition for resources and their high mobility, factors such as the quality of management and availability of appropriate infrastructure become crucial for regional development.

In this context, the quality of governance refers to the quality of financial markets, transparency and efficiency in the application of laws and regulations, the degree of protection for property rights, the level of coordination between government bodies, the development of public-private partnerships and feedback mechanisms, the validity of land-use rules, etc. At the same time, non-state actors play an important role in regional development policies, as they increase the activity of the population, ensure public control, help to more accurately take into account current problems and needs, and form a system of checks and balances.

The development of infrastructure directly affects the pace of regional development, the competitiveness of businesses and the quality of services provided to the population. Its long service life and need for large investments determine the involvement of the state in attracting investment in maintaining and modernising infrastructure facilities. In light of current economic and geopolitical circumstances, the development of transport infrastructure along the North-South and East-West corridors has become especially important for Russian regions to reorient exports, imports and create new areas for foreign economic activity. Meanwhile, there is still a need to continue improving production, social, energy, and tourism infrastructure.

Another significant factor in the effectiveness of regional economic policy today is the business climate (economic, investment, innovation), the content of which includes the quality of the local production environment, the level of tax burden, the possibility of obtaining financial resources, the speed of obtaining permits and approvals, availability of services to support investment projects, and overall convenience and comfort of doing business.

Separately, we can highlight indicators that characterise the favourableness of the innovation climate. In a modern market economy, the ability to develop and implement innovation is the most important competitive advantage:

- the image of the region and promotion of its advantages;
- the size and quality of the regional labour market;
- the degree of diversification of the region's economy by industry and enterprise size;
- the availability and quality of innovation infrastructure, including technical, consulting, financial, sales, personnel training;
- the availability of opportunities for cooperation between state, private and public institutions.

Long-term practice in both unitary and federal states demonstrates the ineffectiveness of exclusively using

macroeconomic instruments to equalise interregional disparities, as a simple redistribution of funds from donor regions to subsidised regions does not guarantee a sustainable and positive long-term economic effect. In this context, there has been a shift in attention to other mechanisms for state intervention at the regional level, such as promoting growth in regional incomes and investments, tax revenues, and the expansion of the labor market, as well as increasing the overall competitiveness of the region.

Taking into account the above, the following can be defined as the main vectors of regional economic policy:

- improving the quality of governance (improving the regional regulatory framework, transparency, coordination, efficiency and accountability of government bodies);
- developing human capital;
- involving non-state actors in the process of developing, making and monitoring the implementation of decisions;
- ensuring the availability, adequacy and high quality of infrastructure;
- accessibility of public goods (social and urban environment, environmental friendliness, safety);
- promoting an open and competitive socio-economic environment (transparency of government bodies, fight against corruption, economic and political competition).

One of the most comprehensive instruments for implementing regional economic policy is regional strategic planning, which involves the independent determination of development goals and priorities by the regional community. This tool allows defining benchmarks and creating the objective prerequisites for economic growth in the region. Today, participatory planning has become widespread, including at the regional level, which ensures the real participation of all stakeholders (government, civil society, business) in developing and implementing strategic planning documents [Prokofiev, 2025].

Depending on the object and subject, planning can be divided into socio-economic, financial, and territorial. Socio-economic planning is carried out to define and achieve the main socio-economic indicators for the coming period, while financial planning forecasts the revenue side of the budget and fixes the directions of funding. Territorial planning reflects the spatial aspect of the planned activities, including where, how, and what infrastructure will be located.

Based on the results of the strategic planning process, depending on the level of detail, documents such as strategy, concept, plan, project or comprehensive or target programme may be approved. Elements of modern strategic planning documents include goals, objectives as well as resources and activities to achieve them. It is logical that strategic planning documents should be developed for long- or medium-term periods. However, in the current practice, it is shown that rolling planning is more effective in a dynamic external environment. Documents should be regularly updated and adjusted (every two or three years).

Next, we will discuss other micro-instruments used in implementing regional economic policy. One relatively new direction for regions, which public administration has borrowed from commercial entrepreneurship, is regional marketing and branding of territories. Today, the image, brand, and reputation of territories have become an additional economic factor in competitive struggle for businesses, investment, population, highly qualified staff, and tourist flows. Residents use a region's brand to decide where to live, study, or vacation, while businesses use it to locate investment projects. A positive, recognisable brand for a region helps convey the mission, values, and specifics of the place, achieving loyalty and emotional connection with it, while an absence of a brand or intimidating reputation can lead to the outflow of valuable resources needed for regional development [Ugryumova, 2025].

Territory marketing is a targeted promotion of the interests of a territory and the creation of a positive image for it. The main actors in implementing the territory's marketing policies are authorities at the appropriate level and agencies they create. Territory marketing has two main stages: positioning and promotion. In the first stage, a marketing strategy for the territory is developed, and in the second stage marketing communication with target audiences is carried out directly.

Regional branding involves creating a unique and recognisable style (the so-called identity), symbol or slogan that is associated with the territory and attracts additional attention to it. An effective regional brand is original, easy to understand and attractive. Visual symbols play a significant role in a brand, so they should be prominently displayed on official materials and products.

Today, regional marketing has become widespread: a corporate identity and brand book have been developed in the Nizhny Novgorod region. The Moscow metro and transport have their own identities, and in 2020 the Volgograd region got its own logo (a stylised Latin letter V). In some regions, branding work is just beginning or is still ongoing, but using this tool can be safely called one of the positive trends in modern economic policy.

As mentioned earlier, it is impossible to imagine a modern economy without innovation activities. Thanks to these activities, innovations are developed and implemented in various industries, stimulating innovation being another area of regional economic policy. Currently, regions have a wide range of tools for

developing their innovation potential, including clusters, technology parks and regional innovation systems.

Clusters are a group of geographically and economically interconnected organisations that complement and strengthen each other. The cluster approach allows companies to reduce costs, exchange knowledge and experience, and its peculiarity is its focus on innovative activities. In this regard, regions face the task of creating favorable conditions for the formation and development of regional economic clusters, namely: support for cluster initiatives, diagnostics, stimulation, monitoring of cluster activities and general assessment of the effectiveness of cluster policies.

As a rule, the cluster approach is applied to the most successful and promising sectors of the regional economy. At the same time, it assumes mutual coordination with strategic planning documents in order to achieve an even greater economic effect. Thus, cluster policy is reflected in long-term development strategies for the Republic of Tatarstan and Kaluga Region. This has allowed the creation of effectively functioning clusters in mechanical engineering, automotive, metalworking, medicine, oil and gas, chemical, and other industries in these regions.

According to the results of 2015, the dynamics of production volume in the 'Pharmaceuticals, Biotechnology, and Biomedicine' cluster of the Kaluga region significantly outpaced that of other sectors of regional economy, as well as the growth of domestic market for medicines. At the same time, more than 70% of products created by enterprises in the cluster were innovative, confirming the effectiveness of cluster approach to innovation [Limonov, 2025].

Technoparks are similar to clusters in that they are the result of the integration of educational, scientific, financial and industrial organisations. These organisations cooperate on a certain territory to directly generate innovations and commercialise them. Technopark management is carried out by specially created bodies. As of 2025, more than 150 technoparks have been established in Russia, covering more than 50 regions of the country[1].

Another similar institution of innovation activity is the regional innovation system, which consists of

Table 3
Types of regional innovation systems

Type of regional innovation systems	Characteristics	Examples of regions
Peripheral agricultural and industrial regions	It is necessary to create favourable conditions for the implementation of innovative potential	Kirov, Kostroma, Yaroslavl regions, etc.
University industrial territories	Close interaction between the academic scientific environment and local industry is noted	Novosibirsk and Tomsk regions
Old industrial regions	Innovative potential can be developed through the import of technologies and the creation of new industries or by introducing radical innovations and rethinking traditional activities	Chelyabinsk, Perm, Tula, Kemerovo regions, etc.
Metropolitan service areas	High concentration of qualified personnel, high agglomeration effect	Moscow and St. Petersburg agglomerations
Climate-favorable, agro-industrial, recreational regions	Comfortable climatic and social conditions can help attract qualified personnel	Subjects of the Southern Federal District
Highly specialised industrial regions	Innovative activity is focused on moving away from narrow specialisation, the success of the innovative path of development is due to the quality of secondary education and the ability to retain creative people in the territory	Novo-Shakhtinsk (Rostov region), Kurchatov (Kursk region), cities of the Yamalo-Nenets Autonomous District
Regions of pioneering economic development of natural resources	Large corporations, the high role of knowledge-intensive resource services, the mobilisation of all types of innovations for the transformation of new territories become a catalyst for development	Arctic shelf development areas, Arctic advanced development zones

Source: [Pilyasov, 2012].

[1] https://akitrf.ru/news/nazvany-samye-effektivnye-tekhnoparki-rossii-2020/.

regional organisations with stable relationships that produce, disseminate, and use new knowledge. This facilitates financial, economic, informational, and legal support for innovation processes.

The formation of a regional innovation system requires the presence of highly qualified personnel in the region, higher education institutions, research organisations, and active involvement of regional authorities. The regional authorities formulate the goals and strategies of the innovation system and coordinate its activities.

The regional innovation system consists of three key subsystems:

- organisations that directly generate innovation: universities, research centers, as well as organisations that conduct research and development;
- organisations that implement innovation and distribute it in the form of finished products;
- intermediary organisations (expert assessment, financing, infrastructure provision): investment development agencies, chambers of commerce, legal organisations, etc.

Domestic scientists have developed a typology of regional innovation systems that takes into account the characteristics and innovation potential of all regions of Russia (Table 3).

Let us briefly discuss such a regional economic policy tool as public-private partnerships. This mechanism is used in situations where state resources are not enough to implement an event or project (for example, infrastructure), and private organisations are therefore involved in managing socially significant facilities.

The basis for such a partnership is a mutually beneficial combination of tangible and intangible assets over a long period through the conclusion of a contract between government and private companies. The ultimate goal of the partnership is to provide public services or create public goods.

Public-private partnerships can take various forms, including lease agreements, management or service contracts, concession agreements and specialised contracts. The regulatory framework for public-private partnerships in the Russian Federation was established with the approval of Federal Law No. 115-FZ of 21 July 2005 ‘On Concession Agreements’. Individual provisions (regarding life cycle contracts) are also reflected in Federal Law No 44-FZ of April 5, 2013 ‘On the Contract System in the Sphere of Procurement of Goods, Works, Services for State and Municipal Needs’. Finally, on July 13, 2015, Federal Law No. 224-FZ ‘On public-private partnership and municipal-private partnerships in the Russian Federation’ was approved, establishing the concept of a partnership agreement and its mandatory elements. The law also establishes the principles of partnership, as well as the assessment of its effectiveness based on two criteria: financial effectiveness and socio-economic impact.

Today, public-private partnerships are most actively used in Russian regions for housing and utilities (construction, operation, and maintenance of utility networks) and transport (organisation of public transportation, construction, and maintenance of roads and transport infrastructure). As a tool of economic regulation, this mechanism has its shortcomings, including a decrease in government control over the quality of services provided or an increase in costs, but at the same time, it is a compromise that allows the simultaneous use of advantages from both the public and private sectors.

Traditional instruments of regional economic policy include support for entrepreneurship and the labour market. In developed countries, small and medium-sized enterprises account for a significant share of gross domestic product and employment, and they actively engage in innovative activities. Russia, including at the regional level, implements policies to stimulate the activities of small- and medium-size businesses in order to increase employment, tax revenues, and create a competitive environment.

To achieve the listed goals, a corresponding business support infrastructure is being created at the regional level. This includes development agencies, entrepreneurship support funds, credit funds, investment funds, business incubators, industrial parks and engineering centers.

As for support of the labor market, regions use the usual groups of regulatory methods: economic, organisational, and administrative (Table 4).

Most often, employment support is provided by regions within the framework of state programmes of constituent entities of the Russian Federation coordinated with federal programs (since January 1, 2025, the national project ‘Personnel’), taking into account the state of regional labour markets and other socio-economic characteristics. As a rule, these programmes are adopted for medium-term planning and reflect sources of funding, lists of specific activities, and indicators of efficiency. Thanks to effective use of employment measures, unemployment rates in Russia are at an all-time low and stand at 2.3%[2].

2. Challenges and prospects of regional economic strategy

The regional economic policy pursued by the subjects of the Russian Federation inevitably faces challenges of various natures. One of the largest such challenges in recent times has been the COVID-19 pandemic, which

[2] https://www.interfax.ru/business/1006881.

Table 4
Types of methods to support the regional labour market

Group of methods	Examples of methods
Economic	Preferential taxation and lending to organisations Targeted financing of strategically important enterprises Stimulating self-employment
Organisational	Creation of a system of career guidance, training and retraining of specialists Informing the population about the situation on the labor market, career opportunities Providing comprehensive employment support
Administrative	Development and implementation of target programmes Organisation of internships and temporary employment Provision of targeted assistance when moving

Source: compiled by the authors.

has significantly impacted almost all processes in both the global and regional economies. Although we can already speak about overcoming many of the negative consequences of the pandemic, we cannot ignore the new threat of increased sanctions pressure from unfriendly countries that Russian regions face.

The departure of a number of foreign companies from the Russian market, disruption in supply chains, decline in investment activity, restriction on the importation of foreign goods, and export of domestic products, as well as currency fluctuations, were all consequences that regional economic systems faced as a result of the imposition of new sanctions aimed at containing the Russian economy and limiting its growth.

The need to counteract sanctions required regions to take urgent measures to adapt regional economic policy to new conditions. Thus, in all regions of Russia, appropriate coordinating bodies have been created or measures are being implemented aimed at supporting the economy under sanctions. For example, in the Volgograd Region, there is an operational headquarters for strengthening the stability of the economy under sanctions restrictions[3], in the Krasnodar Region, a Plan for Ensuring Sustainable Development of the Economy and Social Stability is being implemented[4], the government of the Republic of Tatarstan has developed a package of measures to support the economy under sanctions[5] etc.

Let's look at specific examples of economic support measures used by regions to mitigate the negative effects of sanction pressure. In the Volgograd region, a priority action plan for 2024 was approved to ensure economic development under external sanction pressure, which includes 50 measures worth a total of 10.2 billion roubles[6]:

– 4 general organisational measures (operation of hotlines, website content, etc.);
– 9 measures to reduce pressure on business;
– 7 tax incentive measures;
– 5 measures to support the labour market;
– 4 measures of direct support for small and medium-sized businesses;
– 2 measures to diversify exports and stimulate import substitution;
– 16 industry support measures;
– 3 measures to accelerate budget procedures.

According to the report of the Committee for Economic Policy and Development of the Volgograd Region, these measures to support the economy, together with the implementation of national and regional projects, have created conditions for sustainable socio-economic development in the Volgograd region in 2024. Considering an objective assessment of future risks, it is planned to ensure the achievement of all planned goals by 2025 through the formation of necessary reserves.

A similar approach is used in one of the most economically developed regions of Russia - the Republic of Tatarstan. Its own regional support measures include grants for young entrepreneurs, preferential loans for self-employed citizens, small and medium-sized enterprises, microfinance products for exporters, and lending for investment purposes. For example, enterprises in the industrial cluster have the opportunity to receive a subsidy up to 50% on the purchase of import-substituting equipment and components. They can also receive a preferential loan at an interest rate of 7% per year for up to ten years, not pay income tax, and pay insurance premiums at reduced rates.

In the context of previously described instruments for regional economic policy aimed at stimulating innovation, it should be noted that 23 industrial parks, five advanced development territories and four technology parks have been established in Tatarstan, as well as two special economic zones. Moreover, the

[3] https://economics.volgograd.ru/current-activity/.
[4] https://economy.krasnodar.ru/activity/mery-podderzhki-v-usloviyakh-sanktsionnogo-davleniya.
[5] https://kazanfirst.ru/articles/602866.
[6] https://economics.volgograd.ru/current-activity/.

Table 5
Dynamics of economic indicators of Russian regions in 2024

	Industrial production index (% to January - December 2023)	Retail turnover (% to January - December 2023)	Volume of investments in fixed assets (% to January - December 2023)	Unemployment Rate October - December 2024 (% of labour force)
Central Federal District				
Voronezh region	102.5	108.1	107.1	2.2
Kaluga region	110.5	103.0	111.8	1.2
Northwestern Federal District				
Republic of Karelia	99.3	104.1	93.1	3.8
Leningrad Region	108.2	103.6	137.3	2.8
Southern Federal District				
Volgograd region	101.2	106.7	115.1	2.2
Rostov region	104.7	111.5	116.6	2.3
North Caucasian Federal District				
Republic of Ingushetia	111.1	110.7	73.6	25.6
Chechen Republic	106.6	106.2	127.4	7.5
Volga Federal District				
Republic of Bashkortostan	105.4	112.3	124.7	1.4
Nizhny Novgorod region	103.3	107.7	102.5	1.2
Ural Federal District				
Kurgan region	124.9	106.7	114.9	2.2
Chelyabinsk region	99.4	113.5	119.8	1.7
Siberian Federal District				
Altai Republic	111.3	103.9	116.3	5.9
Novosibirsk Region	103.4	111.5	156.2	2.1
Far Eastern Federal District				
Republic of Buryatia	105.4	105.5	86.5	4.3
Primorsky Krai	103.0	108.7	105.3	2.3

Source: compiled by the authors based on materials from the Federal State Statistics Service. https://rosstat.gov.ru/folder/11109/document/13259.

proportion of jobs in these structural entities, as well as small and medium-sized businesses in the republic, amounted to 25% in 2023, which is almost ten times higher than the average in Russia.

Thanks to the competent and timely application of economic regulation measures, the Tatarstan economy, diversified by sectors, manages to demonstrate annual growth in gross regional product and other key economic indicators.

To assess the current economic situation and the degree of stability of regional economic systems under sanctions pressure, we will consider selectively the dynamics of the main economic indicators for the constituent entities of Russia's federal districts in 2024 (Table 5).

As follows from the presented data, irrespective of the federal district, a vast majority of regions demonstrate positive dynamics in industrial production indices, retail turnover, and volume of investment in fixed capital. This indicates a rather stable position for regional economies. However, in some regions, there is a notable decrease in investment volumes in fixed capital, indicating the need to take more active measures to improve the investment climate and attract investment, taking into consideration regional investment potential.

The unemployment rate in the regional context can be characterised as low, except for the subjects of the North Caucasus Federal District. The higher unemployment rate there compared to other federal districts is explained

by the traditionally high share of agriculture and the greater prevalence of hidden employment.

It is also worth noting that a record low unemployment rate may carry risks, as it may indicate an increase in demand for labour. Thus, some regions are already facing and others may face new challenges in the form of shortages of personnel for economic needs, especially given the difficult demographic situation. All regions have felt the negative effects of economic sanctions, but external economic pressure has also pushed the authorities of constituent entities of Russia to adapt and find other ways to ensure economic stability.

Further prospects for improving regional economic policy can be divided into several areas. One of these areas is the development of interregional and international cooperation aimed at building new economic ties and production chains. This is especially important in a situation where a significant number of large Western companies have left the Russian market. New opportunities are opening up to expand and deepen trade and economic cooperation with friendly states. Exports and imports can be reoriented to other regions of the world, creating new opportunities for growth and development.

As an example, we will cite the Republic of Tatarstan and the Volgograd region. Tatarstan has long been establishing foreign economic relations with countries of the Islamic world due to the predominance of this religion in the republic. The Tatarstan Oil and Gas Chemical Forum and the international forum 'Kazan Digital Week' and the international economic forum 'Russia-Islamic World: KazanForum' are held annually in the capital of Tataristan, thanks to which the region attracts significant volumes of investment from Eastern countries. After further sanctions were introduced in 2022, trade turnover between Tataristans and Azerbaijan, Turkey, and Uzbekistan increased.

In 2024, the Volgograd Oblast signed a cooperation roadmap for 2024-2026 with the Republic of Belarus. The purpose of this cooperation is to deepen partnerships in trade, economic, cultural, and humanitarian spheres as well as to expand ties in science and technology. This cooperation increases the competitiveness of the region and reduces potential risks to the regional economy.

Another area is the improvement of internal processes in regional economic policy, such as the introduction of lean manufacturing technologies. The Nizhny Novgorod region can be cited as one of the undisputed leaders in this field. The region began to intensively use lean technologies in management in 2017, with the launch of the 'Effective Region' project, which was subsequently supplemented by the 'Effective Government', 'Effective Municipality' projects. It is noteworthy that lean approach was implemented not only in manufacturing enterprises in the region, but also in government bodies. As a result, a positive economic effect manifested itself in various areas, from providing municipal services to producing agricultural products. Due to optimisation of standard processes, labour productivity increased and the quality of products improved. The overall economic effect of implementing lean manufacturing principles amounts to hundreds of millions of rubles per year[7].

At the initiative of the Governor of Nizhny Novgorod region, the 'Lean Governor's Club' was created to unite regions aimed at improving the efficiency of production, public administration, and the social sphere. Currently, the Efficient Region project has been implemented in 36 constituent entities of Russia. Since 2018, over 32,000 different projects have been completed or are still being implemented with its assistance, which is particularly important in the context of implementing the federal project on labour productivity under the national project for an efficient and competitive economy.

The challenges and promising areas highlighted the importance of the regional level in the structure of the national economy. They also show that regions are keeping their finger on the pulse, able to adapt to changing economic conditions, and use a wide range of instruments to ensure sustainable socio-economic development.

3. Conclusion and further research

The study revealed a wide range of instruments used within the framework of regional economic policy and assessed their effectiveness in modern conditions. Current challenges - from global instability to internal restrictions - require regions to be not only resilient but also adaptable. The study concluded that given the institutional and resource base, subjects of the Russian Federation have the ability to pursue flexible and targeted economic policies that can take into account territorial specifics and respond promptly to external and internal changes.

Promising areas for the development of regional economic policy include strengthening interregional and international cooperation, optimising management processes, and forming adaptive models of management, as well as transitioning to a 'supply-side economy,' which is being increasingly discussed at various government levels, including the regional level.

In the context of the topic, the issue of evaluating the effectiveness of regional economic policies and analysing the balance between costs and results remains relevant. Therefore, within the framework of future research, it is proposed to identify the main methodological approaches that enable a qualitative and objective assessment of individual policy elements and its overall effectiveness.

[7] https://strategy.nobl.ru/stati/gosupravlenie/uvidet-problemu-i-ustranit-kak-berezhlivyie-texnologii-uluchshayut-region/.

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Strategic and operational planning of anti-crisis measures

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Abstract

The article is devoted to the issues of strategic and operational planning of anti-crisis measures in organizations. The study is based on the analysis of scientific works by domestic and foreign scientists, which allowed us to analyze key tools that help companies adapt and respond to crisis situations. The necessity of introducing innovative approaches to managerial decision-making in order to eliminate the problem of uncertainty is substantiated. The article highlights the disadvantages of a typical form of enterprise rehabilitation, as well as the expediency of implementing strategic controlling. The signs of strategic anti-crisis planning and the directions of the anti-crisis financial strategy are highlighted. As an innovative solution in the field of organizing anti-crisis measures, the introduction of a balanced Scorecard (BSC) is proposed, which allows creating a holistic picture of the organization's performance. The system allows you to manage external and internal risks through preliminary strategic analysis and monitoring of indicators of various areas of the organization's activities. The article presents the stages of implementation of the balanced scorecard system according to the BSC model. In addition, the study focuses on the importance of a process-based approach to controlling indirect costs, due to their significant share in the organization's cost structure. The article provides an example of a system of balanced indicators for a segment of the financial sector of an operating enterprise, including specific indicators, as well as a cost management model based on the ABC (Activity-Based Costing) method. The results are summarized on the importance of strategic and operational planning to ensure the sustainability of enterprises in a crisis. The necessity of an integrated approach to crisis management, including innovative tools, is proved. Thus, the article can be useful for both researchers and practitioners involved in management and finance.
Keywords: crisis management, controlling, ABC method, balanced performance system, Balanced Scorecard

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反危机措施的战略和业务规划

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简介

文章专门讨论了组织中反危机措施的战略和业务规划问题。研究基于对国内外科学家科学著作的分析，这些著作有助于分析帮助企业适应和应对危机情况的关键工具。 文章论证了在管理决策中引入创新方法以消除不确定性问题的必要性。文章阐述了典型的企业复兴形式的弊端，并明确了实施战略控制的适宜性。文章强调了反危机战略规划的特点和反危机财务战略的方向。 作为反危机措施组织领域的创新解决方案，建议实施平衡计分卡（BSC），通过对组织活动各领域指标的初步战略分析和控制，全面了解组织绩效，管理外部和内部风险。本文介绍了根据 BSC 模型实施平衡计分卡系统的各个阶段。 此外，由于间接成本在组织的成本结构中占很大比重，本研究重点关注基于流程的间接成本控制方法的重要性。论文介绍了一个运营公司财务分部平衡计分卡的实例，包括具体指标，以及基于 ABC（基于活动的成本计算）方法的成本管理模式。 文章说明了战略和业务规划对于确保企业在危机条件下的可持续性的重要性。文章证明有必要采取综合方法进行危机管理，包括创新工具。因此，文章对从事管理和财务工作的研究人员和从业人员都很有用。
关键词: 反危机管理、控制、ABC 方法、平衡计分卡、 Balanced Scorecard

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Introduction

In modern conditions, many Russian enterprises are experiencing difficulties due to financial problems. Using crisis management tools and approaches is essential for the sustainable and continuous operation of businesses.

In modern conditions, many Russian enterprises are experiencing difficulties due to financial problems. Using crisis management tools and approaches is essential for the sustainable and continuous operation of businesses [Burdina et al., 2023]. A review of domestic and foreign sources allows us to conclude that a crisis can be defined as an unstable situation or process characterized by threats and dangers that require response measures [Ekimova et al., 2019].

Worthy of attention is the opinion of I.V. Nikitushkin and co-authors, who interpret an economic crisis as a state in which the economic system is unable to perform its basic functions. They take into account the differentiation of the problem according to the indicator of the share of unstable enterprises in their total number and the volume of government spending on supporting industry in a crisis [Nikitushkina et al., 2020]. However, this approach is largely debatable, as the presence of problematic enterprises is only one of many destabilising factors in the economy.

A large amount of scientific research into the problems of crisis emergence is associated with studying them at the level of individual economic entities. V.N. Vyatkin, V.A. Gamza, and D.D. Hampton associate crisis situations with internal (microeconomic) factors due to an ineffective enterprise management system [Vyatkin et al., 2021]. When considering modern approaches to the main factors in the emergence of financial and economic crises, it should be noted that many authors consider financial instability in a country and the decrease in the liquidity of companies as the main ones.

Thus, crises arising from the processes of the functioning and development of the economy can lead to both a systemic crisis and the recognition of companies as insolvent, and lead to their reorganization or bankruptcy. Destructive factors do not ensure the efficient functioning of the business sector, significantly reducing the competitiveness of a country.

1. Problem statement

In order to make effective financial and economic decisions, it is necessary to provide effective methodological, informational, and coordination support for them. The need for this support, including the use of scientific methods to justify decisions, increases during times of uncertainty and increased risk [Narkevich, 2020; Pronyaeva et al., 2023]. The uncertainty factor, which is closely related to risks, complicates the process of forecasting activities and financial indicators [Stynych, 2023]. If negative processes are out of control, they can lead to the emergence of a financial crisis in the enterprise. The professional use of financial control tools allows to solve the problem of uncertainty to some extent in making financial decisions [Ivanov, 2021; Burdina et al., 2022]. In the context of anti-crisis management, we mean the widespread introduction of the latest technologies in the process of strategic and operational planning for anti-crises measures, cost management, and quality control over the implementation of an anti-crisis programme [Marsen, 2020].

It is necessary to distinguish between two types of anti-crisis planning: preventive and remedial. Preventive planning is implemented at the stage of prevention of a financial crisis, where measures aimed at preventing crisis situations are planned. This includes planning measures within the early warning and response subsystems [Chen, 2024]. If there is no risk management system and the enterprise is experiencing a financial crisis, then it is necessary to move to the second stage, which involves using a recovery-type anti-crisis management approach - financial recovery planning.

The organisation of anti-crisis measures is largely subject to legislative regulation. The main document in the field of anti-crises management is the Federal Law No. 127-FZ of 26 October 2022 ‘On Insolvency (Bankruptcy)’[1]. Normative legal regulation in this area stems from the need to establish safeguards against manipulation and abuse by certain interest groups.

A study of the structure of a recovery plan approved by a regulatory legal act allows us to identify a number of shortcomings in this approach to crisis planning:

1) regardless of the circumstances in which anti-crisis measures are implemented, their planning should be carried out on two levels - strategic and operational. At the same time, the standard form of rehabilitation recommended lacks a strategic level of planning and analysis;

2) a necessary condition for successful anti-crisis management is effective risk management, which involves identifying, analysing and neutralising risks [Yang et al., 2021]. However, the standard form of the reorganisation plan does not include risk management mechanisms;

3) to conduct a qualitative assessment of the financial condition of an enterprise, it is necessary to analyse the factors that led to its insolvency. It is also necessary to analyse its assets, accounts receivable, and payable, as well as the profitability of the company, long-term and current financial investments. Adequate analysis methods are required for this, which are not mentioned in the regulatory act mentioned above;

4) planned measures to restore the debtor’s solvency and pay off claims to creditors must be integrated into the system of strategic and operational planning and supported

[1] https://www.consultant.ru/document/cons_doc_LAW_39331/.

by specific planned indicators [Prizhigalinskaya et al., 2020]. For this purpose, an integrated system of anti-crisis plans should be developed, including their forms;

5) an integral part of the anti-crisis plan should include a forecast assessment of its effectiveness. At the same time, the socio-economic consequences of the proposed rehabilitation plan are too general. It is unclear which financial indicators of debtor activity are being planned, and what criteria will be used to determine the success or failure of anti-crises measures [Apolzan Arădăvoaicei et al., 2023].

In order to improve the quality of crisis management planning, we will introduce a number of innovative tools to the arsenal for crisis financial control. A strategic element should be added to the crisis planning system. Therefore, it is appropriate to conclude that strategic control of the company's activities and development of a plan to prevent insolvency is one of the main measures for crisis financial management [Grebennikov, Tarasevich, 2021; Mekerova, 2023]. A group of economists has identified the main features of strategic anti-crisis planning:

- falls within the competence of top management (the highest level of enterprise management);
- is focused on the development of the enterprise over the long term;
- compared to operational planning, it is accompanied by a significantly higher level of uncertainty [Bozhko, 2022];
- creates the framework conditions and the basis for operational planning of anti-crisis measures [Titova, 2017].

It is advisable to specify the features mentioned above in the direction of anti-crisis strategic planning attributed not simply to top management, but also to financial controlling as part of company management. In addition, in some cases, issues related to anti-crises planning in general, and strategic planning in particular, can be outsourced to consulting or auditing firms. According to the conclusions drawn in [Sizova, Sizova, 2017; Stynych, 2023], the key areas of an anti-crisis financial strategy should include a thorough analysis of the accounts payable and receivable structure, long-term loan debt, measures to optimise self-financing and depreciation policies, improving current asset management, and the creation of target reserve funds. The strategic reasons limiting company activities are shaped by assessing both the external and internal environments of company operations.

Table 1 presents the summary results of a strategic analysis of the external environment for one of the

Table 1
Assessment of the strategic impact of the external environment (points)

Factors	Impact on the industry	Impact on the company	Direction of impact (+/-)	Overall rating
Unstable economic situation in the country	4	2	–	–6
Fall of the national currency and significant inflation	3	3	–	–6
Restrictions on market access by other countries	4	2	–	–8
Signing of an agreement with other countries	4	4	+	8
High requirements for flight quality by other countries	3	1	–	–4
Credit and investment ratings of the country	3	2	–	–5
Increase in the volume of services	2	1	+	3
Rising cost of energy	2	2	–	–4
Decrease in the population of the country	2	2	–	–4
Fall in real income of the population	2	2	–	–4
Activation of enterprise development	2	2	+	4
High scientific and technical potential	4	4	+	8
Importance of the industry for the country (region)	3	3	+	6
High interest rates on credit resources	3	1	–	–4
Total	–14			

Source: compiled by the authors.

operating companies in the aviation industry (on a 5-point scale in negative and positive directions). The data in Table 1 indicate that macroenvironmental factors have mainly a negative impact on both the industry as a whole and the company under study.

The main problems affecting the sector as a whole and the activities of the research object include high levels of inflation, significant capital costs, market restrictions, falling domestic demand, and general financial and economic instability.

The results of the study of microenvironmental factors of the analysed enterprise in terms of key points are presented in Table 2. Analysis of microenvironment factors reveals a high potential of the company in the financial, commercial and image areas. At the same time, negative factors, depending on industry and the analysed company, include an unsatisfactory asset structure, lack of a control department and problems with suppliers of raw materials.

Taking into account the preliminary anti-crisis financial diagnostics of the enterprise, as well as the analysis of external and internal qualitative factors influencing the activities of the research object, Table 3 presents a SWOT analysis which systematises strengths and weaknesses.

Sector 1 visualises the need for an offensive strategy based on using the enterprise's potential and opportunities arising from favorable external factors.

Sector 2 indicates that it is necessary to use strengths to mitigate external threats, and the diversification strategy is justified. This strategy is useful for most companies that need to reorient themselves away from Russian markets and towards other countries.

Table 2
Strategic diagnostics of the microenvironment (points)

Factors	Impact on the industry	Impact on the company	Direction of impact (+/-)	Overall rating
Perfection of the organisational management structure	0	2	+	2
Presence of a marketing department	1	2	+	3
Completeness of the performance of functional duties by employees	0	3	+	3
Quality of the structure of the range of services provided	3	3	–	–6
Systematic quality control of services	6	3	+	9
Presence of a flexible policy	3	3	+	6
Use of progressive sales tools	3	3	+	6
High level of indirect costs	0	6	–	–6
Level of accounts receivable	3	3	+	6
Compliance with the golden rule of financing	0	2	+	2
Capital costs of the enterprise	3	3	–	–6
Credit ratings of the enterprise	3	3	+	6
Relations with suppliers	3	2	–	–5
Presence of a controlling system	0	6	–	–6
Image among end consumers	1	2	+	3
Business rating	1	2	+	3
Technologies of the process of providing services and asset structure	4	2	–	–6
High sensitivity of customers to the quality of services	2	2	+	4
Favorable attitude of customers to new types of services	2	2	+	4
Provision by suppliers of forms of payment and terms of delivery that are favorable for the enterprise	1	2	+	3
Total	+21			

Source: compiled by the authors.

Table 3
Strengths and Weaknesses Analysis (SWOT) Matrix

External environment Internal environment	Opportunities: entering new markets, significant development of the industry, the importance of the industry to the state	Threats: limited access to foreign markets, high interest rates, rising inflation, rising energy prices
Strengths: experienced management staff, market expertise, long-term partnerships with Russian companies, high company credit rating, and high levels of solvency indicators	Sector 1: increasing the diversity of services offered; raising service standards; reducing systemic risks; investing in advanced technologies	Sector 2: development of competitive strategies, search for alternative sales markets, diversification of sources of capital, and attraction of highly qualified personnel.
Weaknesses: high capital costs, insufficient level of service diversification, low quality of control, low level of performance, significant volume of indirect costs	Sector 3: reducing implicit capital costs, upgrading fixed assets, improving financial planning, expanding the range of services, introducing innovative approaches to management	Sector 4: use of modern methods of control, reduction of energy costs, development of additional sales markets, optimisation of indirect costs, and use of insurance mechanisms to protect against currency risks.

Source: compiled by the authors.

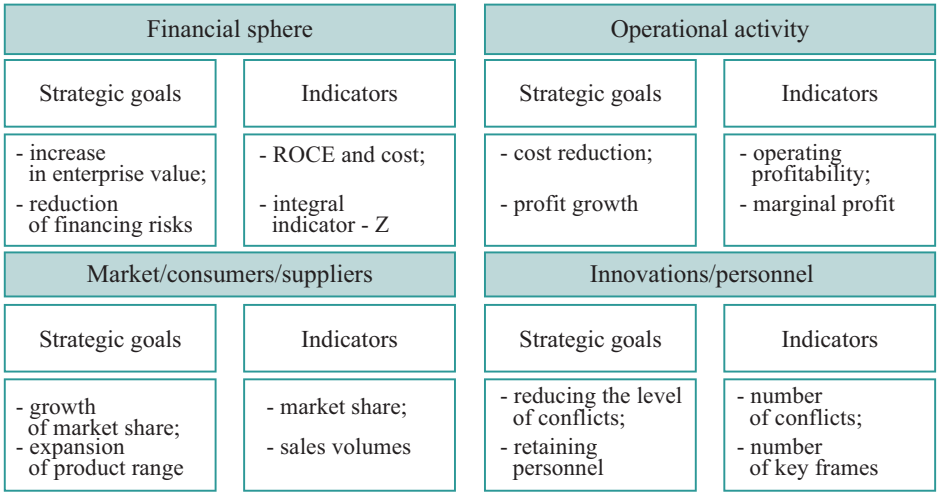
In sector 3, it is required to implement strategies to overcome weaknesses due to external capabilities, as well as to use cost reduction tools.

Finally, sector 4, the 'crisis field', indicates the need for anti-crisis strategies aimed at overcoming external and internal threats to the company. Based on the strategic SWOT analysis, the enterprise in question is recommended to use a set of strategies aimed at eliminating external threats by activating internal resources.

2. Research findings

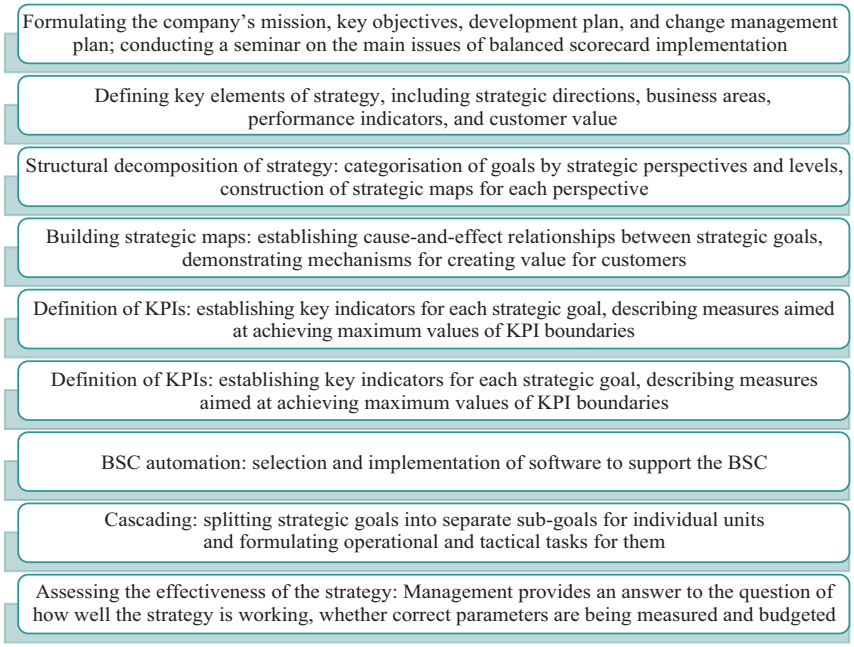
It is proposed to implement mechanisms of strategy using the balanced scorecard (BSC) system. The Balanced Scorecard System can be considered an innovative tool for strategic control, in particular, in the context of planning anti-crisis measures. This system integrates both quantitative and qualitative aspects of the company's activities. Based on the identification of critical success factors, the balanced

Fig. 1. The system of balanced indicators
in the framework of anti-crisis strategic planning



Source: compiled by the authors.

Fig. 2. The stages of implementing the balanced scorecard according to the BSC model



Source: compiled by the authors.

scorecards record the strategic goals of a company in four main categories (perspectives): financial, market/client, operations/business process, and personnel/innovations. The system has been designed so that it can promptly identify external and internal risks to the company'. Among the indicators included in the financial projection, it is proposed to include a value-oriented indicator - ROCE (return on capital employed), an absolute indicator of company value and an integrated indicator of financial condition (Z), which could be the Altman creditworthiness index or any other criteria of the probability of potential bankruptcy. These indicators could serve as early warning indicators for a crisis. A diagram of the BSC system is presented in Figure 1.

The stages of implementing a balanced scorecard system in accordance with the BSC model are presented in Figure 2. Generally, the implementation of a BSC system is considered successful if it allows reducing gaps and inconsistencies between strategic objectives and operational decisions. Therefore, specific strategic objectives should be defined, that is, converted into measurable and controlled values. Key performance indicators (KPIs) for the financial dimension should characterise priority financial parameters of an enterprise, indicating the level of achievement of strategic goals of an organisation.

The scoring card for the 'market/client/supplier' perspective should describe target benchmarks and

Table 4
Direction 'Financial sphere' of the balanced indicators system

Goals	Indicators	Events (project)	Fact	Plan		
			2023	2024	2025	2026
Growth of credit ratings	Z	Ensuring stability of profitability and solvency indicators	1,35	>1,35	>1,35	>1,35
Growth of value-oriented indicator	ROCE (%)	Improving the asset structure, rationalising working capital, reducing WACC, ensuring operating profitability	04	27	29	34
Reduction of risks	WACC (%)	Reducing implicit costs of equity	19	16	14	12
Growth of company value	Cost (mln rub.)	Reducing indirect costs, reducing capital costs, increasing operating cash flow	195	217	219	225

Source: compiled by the authors.

measures to ensure necessary conditions for the enterprise in markets for product sales and raw materials supply. Supplementing the classic BSC model with a 'supplier' option is fully justified, as the quality of raw materials consumed by an enterprise largely depends on the quality of products (work, services) provided to clients. Therefore, this perspective should include an answer to how to build cooperative relations with suppliers in order to achieve strategic objectives. In the 'personnel/ innovation' area, it is necessary to identify ways to unleash the potential of an enterprise through personnel and innovation to achieve strategic goals.

Thus, the proposed innovations for constructing scoring cards are as follows:

- specific indicators have been introduced to signal crisis phenomena and monitor the progress of anti-crisis strategies;
- the traditional 'market/client' projection has been supplemented by the 'supplier' option.

Table 4 shows the developed segment of the balanced scorecard - a detailed scoring card for the 'financial sphere' direction for the company under study.

Table 4 practically presents the main positions of the financial strategy of the enterprise. Upon achieving specified financial parameters, the organisation will be able to ensure sustainable viability and generate added value. The construction of scoring cards for market/customer/supplier projections, operational activities, business processes, personnel, and innovations is in the realm of marketing, personnel management, and service provision functions, i.e., it does not directly relate to financial controlling competence. In general, the strategy for the future activity of the company under study focuses on expanding the range of services (diversification), reconstructing fixed assets, improving the financial position, reducing capital costs, and other indirect expenses.

The enterprise in question does not have any problems with liquidity or fulfillment of its obligations, either in the long- or short-term. At the same time, its performance situation, particularly with value-oriented metrics, is rather tense and unstable. Therefore, crisis management measures should focus on ensuring positive value for value-oriented indicators and increasing the value of the company.

Successful implementation of planned indicators largely depends on the ability of an enterprise to ensure cost savings, particularly to reduce the level of indirect costs. It also depends on its ability to adhere to strategic objectives defined by the balanced scorecard system. To achieve this, it is important to introduce innovative tools for evaluating the effectiveness of anti-crisis measures and controlling them [Nazarenko, Zhuzhginov, 2022].

In theory and practice, one can find descriptions of numerous operational cost control methods, including direct costing and cost-volume-profit analysis. However, significant impact on the amount and structure of costs is achieved mainly through strategic cost control. At the same time, there is a conditional limit between operational and strategic control methods. Often the same method is effective both in short-term and long-term perspectives. For indirect cost allocation in enterprises selling many types of products and services, standard method of calculating indirect costs is often used with an expertly chosen base.. This method does not always ensure an objective allocation of indirect costs, in particular, expenses not directly related to the production of certain goods or provision of services. In connection with this, enterprises may face strategic problems, as errors will arise in the process of pricing, resource allocation and determining the assortment policy.

Cost control methods should focus on those types and places where they occur, where it is possible to identify the largest reserves for reducing costs. The key problems at enterprises are a result of extremely high levels of indirect and one-off costs hidden in items of administrative, financial and other sales expenses. It is at these weak points in cost management that anti-crisis measures should concentrate, which it would be advisable to single out for additional analysis. Strategic tools for cost control will be useful here, particularly the process-based ABC method, which focuses on identifying cost savings hidden in indirect expenses. Attention should be largely focused on this factor in developing an anti-crises strategy for enterprises.

Within the framework of anti-crisis financial control, the use of this method will ensure the fulfilment of the following objectives:

- identification of indirect costs that caused the crisis situation at the enterprise;
- distribution of indirect costs, in particular, of departments not directly related to production, to individual product types;
- identification of reserves for cost reduction based on determining the need for appropriate actions.

The logic of the process-based cost management method can be described as follows: partial or auxiliary business processes are formed based on a combination of a certain set of transactions; main business processes are formed as a result of combining certain sets of partial (auxiliary) processes. Final products are formed through combining certain main business process activities, which are used to produce manufactured products (works, services). Individual cost centers provide specific partial processes (operations), which are combined into main processes, and then allocated among products. In the initial phase of implementing the process-oriented cost management approach, it is essential to identify indirect expenses with a disproportionately large share in the expense structure, which may lead to financial

difficulties. After that, it is important to determine the expenses of each structural unit and the business processes associated with those expenses. The difficulty lies in clearly identifying and describing the business process, as well as justifying its necessity to ensure production activities. To do this, one should use procedures such as surveying the heads of individual departments or responsibility centers, interviewing key specialists who ensure the process, studying job descriptions and internal regulations, analysing accounting and technical documentation, analysing the functions performed by a certain structural unit [Radchenko, Bobrovskaya, 2023]. In addition, one should try to obtain relevant information on similar enterprises.

The next stage of ABC implementation is the distribution of costs by structural division to individual processes (main or auxiliary). In general, the distribution of costs to processes is carried out using a direct method based on expert assessments, and using the distribution base as an indirect method. At large enterprises, using the first approach is associated with significant labor costs, so it is recommended to use the second method for these business entities. For this purpose, the amount of personnel costs or number of man-years, man-hours, or man-days can serve as the distribution basis. The scale of business processes is assessed by calculating so-called cost drivers, which must coincide with quantitative factors affecting the volume of indirect costs [Sorokina, 2021]. The problem is how to distribute the costs of a separate product between processes, whose costs do not depend on productivity levels. It is advisable to combine these costs arising in all structural divisions of the company under the heading 'other costs'. When determining the full cost of individual services, it is also advisable to distribute remaining costs depending on their amount. The main disadvantages of this approach are the use of multi-level systems for distributing indirect costs and different bases, based on the principle of proportionality. Business processes that cause indirect costs should be examined for their contribution to the aggravation of the financial crisis on the one hand and their contribution to value creation at the enterprise on the other. If a process leads to disproportionate high costs and does not produce the expected effect in terms of value creation, it should be replaced. Implementation of the ABC method in domestic enterprises should be accompanied by active business process reengineering that focuses on radical restructuring of businesses and supporting processes. In general, introducing cost control tools can help improve cost management efficiency, reduce costs, and manage cash flows.

In combination with other anti-crisis measures, cost control will ensure the profitability of the enterprise at an adequate level. Within the framework of financial crisis management, the concept of integrating process cost management tools and reengineering business processes can be successfully applied.

Conclusion

Regardless of the circumstances under which anti-crisis measures are implemented, their planning should be carried out at two levels: strategic and operational. The success of an enterprise's anti-crisis financial strategy is determined by its ability to flexibly adapt to risk factors in the external environment and effectively influence them. To overcome the gaps between the strategic goals of the enterprise and operational anti-crises measures, it is advisable to take into account qualitative factors in planning, introducing a balanced scorecard system that is integrated into the early warning and response systems.

The proposed innovations for constructing a balanced scorecard as a tool for anti-crisis financial controlling are described as follows: specific indicators (ROCE indicator, company value indicator and financial condition indicator) have been introduced to the financial projection of BSC, capable of promptly signaling crisis phenomena and allowing high-quality monitoring of progress of the anti-crises strategy; traditional market/client projection has been supplemented by supplier option; strategic goals have been divided into separate planning periods.

An important area of anti-crisis financial control is cost control, which should focus on the economic use of resources and their rational allocation. Thanks to measures to reduce the need for financial resources, cost control makes a feasible contribution to the financial support for anti-crises measures, on the one hand, and the generation of value added by the enterprise, on the other hand.

Thus, the importance of developing an anti-crisis strategy is due to the need to achieve enterprise goals related to financial stability, which is impossible without understanding guidelines for further development, analysing risks from external and internal environments, and conducting cost control.

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Development of consulting services to support export entrepreneurship

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Abstract
The article focuses on enhancing consulting services to promote the effective development of export entrepreneurship. It emphasizes two main aspects. First, it highlights the importance of popularizing and implementing the core principles of organizational ambidexterity, which should lead to improved financial results for small and medium-sized businesses involved in export activities, making them more stable and predictable for owners in the long run. Second, it discusses the differentiation of consulting services for exporting firms based on their life cycle stage and experience in export entrepreneurship, ensuring that the support provided is clear, valid, and timely. The theoretical and practical significance of this study lies in enhancing the validity of the list of consulting services offered to enterprises interested in engaging in foreign trade amid increasing restrictions. The proposed recommendations can serve as a foundation for refining the content of consulting services for exporters, helping them avoid difficulties and minimize errors in selling their products, as well as optimizing their resources for entering international markets. A promising avenue for further research could involve identifying the factors that influence customer satisfaction with consulting services in export entrepreneurship, as well as developing economic and mathematical models to determine the direction and strength of the relationships between these factors.
Keywords: consulting services, export entrepreneurship, organizational ambidexterity, type of exporter, life cycle, development

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发展支持出口活动的咨询服务

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简介
本文致力于改善咨询服务领域，以有效发展出口业务活动。主要关注两个方面。首先是普及和协助实施组织灵活性的基本原则，从长远来看，这应有助于改善从事出口活动的中小型企业的财务业绩，并使其对企业主而言更加稳定和可预测。其次，根据出口企业所处的生命周期阶段及其出口业务活动经验，对出口企业的咨询进行区分，这将确保所提供支持的明确性、有效性和及时性。这项研究的理论和实践意义在于，在限制越来越多的情况下，促进提高向有意开展对外贸易的企业提供的咨询服务清单的有效程度。提出的建议可作为调整出口商咨询服务内容的依据，以帮助他们在销售产品的过程中避免困难和减少失误，并优化资源的使用，从而进入国际市场。进一步研究的一个有希望的方向可能是，在接受出口创业领域咨询公司的服务时，对影响客户满意度的因素进行证实，并在此基础上形成经济和数学模型，以确定这些因素之间关系的方向和强度。
关键词： 咨询服务、出口活动、组织灵活性、出口商类型、生命周期

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Introduction

The country's existing resource potential, as well as the development of science and technology, contributed to the establishment of export activity as a driving force for the economy, providing on average 27.5% of GDP between 2011 and 2022. However, recent increased external restrictions have led, according to the Federal State Statistics Service, to a decrease in the share of exports of goods and services in GDP to 23.3% in 2023 (in particular, the net export share decreased from 12.6% in 2021 to 4.3%)[1]. This not only necessitated significant adjustments to the established mechanisms of export entrepreneurship, but also increased the importance of companies providing consulting services in this area.

Export-oriented consulting helps to effectively overcome various barriers and reduce risks by offering relevant knowledge and expertise. This is especially important for small and medium-sized enterprises (SMEs) that seek to maintain old foreign markets or enter new ones. Today, export consultants provide companies with information on a wide range of issues, including identifying suitable markets, conducting market research, analysing product compatibility, logistics, customs clearance, and payment methods. Consultants help exporters produce products that meet international standards and optimise their strategies in today's turbulent conditions, avoiding difficulties and minimising mistakes in the exporting process.

1. Initiatives for the development of export entrepreneurship

Within the framework of a significant number of initiatives at various levels of government, information, consulting, educational and other services are already actively provided to SMEs and self-employed citizens. A comprehensive export support system is also being developed. For example, the national project 'Small and Medium Entrepreneurship and Support for Individual Entrepreneurial Initiatives'[2] provides for the implementation of federal projects such as 'Creation of a digital platform for targeted selection of SMEs and individuals and remote support measures', 'Creating conditions for easy start-up and comfortable business operation', 'Accelerating small and medium enterprise growth', and 'Supporting the self-employed'.

As part of the national project, more than 430 My Business centers have been opened in 88 regions and municipalities (excluding Moscow) since 2019. These centers integrate the entire infrastructure of SME support into one place and provide services in various areas: financial, educational, property, information, consulting, assistance to entrepreneurs operating in the fields of innovation and modernisation, as well as exports of goods, work, and services[3].

Another initiative in the field of support for entrepreneurs, the self-employed, and those planning to start their own businesses is the state platform 'Digital Platform MSP.RF'. It acts as a single point of access to government support measures and various services for businesses. Since 2022, more than 895,000 users have registered on MSP. RF, more than thirty online services are available and more than 800 support measures can be applied online[4].

However, it should be noted that export entrepreneurship is specific, and the above initiatives are designed for a wider audience of entrepreneurs. In this regard, other initiatives that take into account the specifics of export activities to a greater extent should be highlighted separately. For example, JSC Russian Export Center (REC), a state institution for supporting non-resource exports, brings together a group of companies that offer a wide range of financial and non-financial assistance measures to Russian exporters. The REC actively collaborates with federal and regional authorities, as well as key industry and business organisations, which enables it to effectively advance the progressive improvement of conditions for conducting export-oriented business activities in the Russian Federation. As of 2024, the amount of financing provided by this institution is 465.5 billion roubles[5].

Separately, it is necessary to highlight the digital platform 'My Export', which was launched in 2020 under the auspices of the Russian Export Center, together with eleven specialised ministries, federal executive bodies, and business associations. These include the Ministry of Industry and Trade, the Ministry of Agriculture, Rosselkhoznadzor, the Federal Customs, and the Federal Tax Services.

[1] Federal State Statistics Service. https://rosstat.gov.ru/.
[2] National project 'Small and medium-sized entrepreneurship and support for individual entrepreneurial initiative'. http://government.ru/rugovclassifier/864/events/.
[3] Portal 'My Business'. https://xn--90aifddrld7a.xn--p1ai/project.
[4] Digital platform MSP.RF. https://xn--l1agf.xn--p1ai/.
[5] Russian Export Centre. https://www.exportcenter.ru/company/.

The platform provides online access for exporters to government and business services that help companies enter foreign markets[6].

Thus, the list of services provided to SMEs, including those engaged in export activities (or planning to do so), is quite wide. This is certainly a positive development. However, constant increasing external restrictions cause significant turbulence in current business conditions, which is exacerbated by the rigidity of many newly accessible markets.

In such a situation, entities that provide consulting support for exporters need, on the one hand, to popularize and utilise existing successful practices and developed tools in their operations, and, on the other hand, they need to deepen and supplement them. Additionally, it is advisable to continuously analyse and adapt the current list and content of services to external circumstances, taking into consideration successful domestic and international experience. Furthermore, it is significant to emphasise that provided consulting services should meet the expectations and requirements of consumers, as well as aim to reduce barriers to entering foreign markets for small and medium-sized enterprises (SMEs) in Russia, and reduce resistance to possible alterations in conditions and management methods.

2. Organisational ambidexterity in export entrepreneurship

An important aspect of business development, which has recently attracted the attention of a number of researchers [Gianzina-Kassotaki, 2017; Gonzalez, De Melo, 2018; Brix, 2019; Chakma et al., 2021; Trachuk et al., 2024; Ahmad et al., 2024; Chen et al., 2024; Martínez-Falcó et al., 2024], is ambidexterity. At the same time, the researchers argue that 'all other things being equal, organisational ambidexterity does indeed improve the financial performance of small and medium-sized businesses. In addition, it reduces the dispersion of these results, that is, makes them more stable and predictable for business owners' [Smara et al., 2024]. This aspect fully applies to export entrepreneurship and, therefore, must be taken into account when providing consulting services in terms of developing export entrepreneurship in conditions of uncertainty.

Based on this, the principles of organisational ambidexterity should be implemented through certain recommendations for providing consulting services aimed at increasing the efficiency of exporting entrepreneurship. Potential options for such recommendations may include.

1. Developing a set of materials for export companies on issues of ensuring strategic flexibility and scenario planning. The recipient of services should develop several future scenarios based on potential changes in the market, changes in regulatory framework and geopolitical risks, which will help prepare for different possible outcomes. In addition, it is necessary to emphasise the importance of regularly reviewing and updating the company's strategic plan to adapt to changing circumstances, as well as implementing a flexible strategic planning process that allows for rapid changes in focus and priorities. Managers must develop competencies in the area of allocating limited resources between short-term profit-making activities (exploitation) and long-term innovation and market research. It is important to maintain a dynamic balance in order to quickly adapt to new opportunities or threats.

2. Developing case studies for working with exporters to develop decentralised decision-making capabilities. Exporters should be able to empower teams in different geographic regions to make decisions quickly in line with local market conditions, as this increases responsiveness to the local market. Focus should be placed on analysing the feasibility of creating separate units or teams for research (e.g., innovation labs, R&D departments) and operations (core business operations). These units should be integrated but operate semi-independently to focus on achieving their goals.

3. Developing and implementing programs for establishing innovative collaboration and partnerships. Two aspects need to be addressed: externally, it is important to form partnerships with other companies, research institutes, and industry experts in order to gain access to new technologies, markets, and ideas (which can facilitate both exploration and routine), and internally, it is necessary to create cross-functional teams consisting of specialists from different areas within the company who can explore new opportunities while ensuring compliance with the core capabilities of the company.

4. Develop a set of materials for export companies on how to increase the use of technology and make data-driven decisions. The materials should cover the use of advanced technologies, such as artificial intelligence, big data analytics, and machine learning, to collect information, predict trends, and make

[6] What is the My Export platform? https://myexport.exportcenter.ru/support/about-us/#34938.

Table 1
Roadmap for the implementing measures to introduce the principles of organisational ambidexterity

Stage	Actions
Stage 1: Evaluation and planning	Conducting a comprehensive assessment of current operations, market conditions, and organisational capabilities Developing a detailed plan to implement ambidexterity principles, with clear goals, deadlines, and resource allocation
Stage 2: Pilot programmes	Launching pilot programmes for key initiatives such as cross-functional team building, new technology implementation, and market research Monitoring performance and gathering insights to scale successful initiatives
Stage 3: Scaling and integration	Scaling successful pilot programs across the organisation Integrating market research and development activities into the overall organisational structure and culture
Stage 4: Continuous improvement	Establishing processes for continuous feedback monitoring and improvement Regularly reviewing and adjusting strategy and tactics to maintain balance and adapt to new challenges

Source: compiled by the author.

informed decisions. This helps both to identify new opportunities and optimise current activities. Cases should also consider the implementation of real-time data monitoring systems to track market changes, customer behaviour, and supply chain dynamics. This allows for quick adjustments to strategies and operations.

5. Developing cases for working with exporters in terms of forming a system for assessing and monitoring the effectiveness of implementing ambidextrous principles. It is necessary to help the company develop competencies for evaluating the effectiveness of these tools, including analysing achieved results and comparing them to set goals. This allows for timely identification of problems, adjustment of management approaches and will be part of a risk management system that allows prompt response to threats and minimises their impact on company activities (especially important in uncertain conditions where unforeseen events can significantly affect success of innovative projects).

It is important to note that measures for implementing the principles of organisational ambidexterity in a company engaged in export activities should be comprehensive and systematic, with a focus on strategic perspective. A simplified version of the roadmap for implementing these and other measures might look like this (Table 1).

3. Differentiation of consulting support according to stages of the exporters' life cycle

According to a number of experts [Kuklina, Korshunova, 2019; Revenko, Sklyar, 2022; Raišienė, Raišys, 2022; Epanchintsev, Shumakova, 2023; Asadi, 2023; Pandey et al., 2024], an important point is the division of consulting support depending on the stage of the life cycle at which the export enterprise is located. For example, for a beginning exporter, the most important thing is to overcome the fear of starting a business. This can be caused by ignorance of current regulations and laws, as well as by the presence of duplicate functions in export development institutions and a lack of competency in researching markets and entering them. Therefore, when providing consulting services, it is necessary to take into account the type of exporter that characterises the experience of the recipient of these services in export entrepreneurship and the stage of their company's life cycle. Table 2 provides an

Table 2
Directions for providing consulting services by type of exporter

Directions	Type of exporter		
	Beginner	Situational	Systemic
Assessment of readiness for export	+	+	+
Market research	+	+	
Identification of market potential		+	+
Assessment of tariff and non-tariff restrictions, requirements for the product/service	+	+	
Formation of a client profile	+	+	
Selection of tools for finding partners	+	+	+
Competitor analysis		+	+
Drawing up an export plan	+	+	
Search for ways to enter the market, including	+	+	+
– direct sales abroad	+	+	
– use of sales agents or distributors in the target country	+	+	
– licensing of products or services		+	+
– franchising of own business			+
– creation of joint venture		+	+
– creation of representative office of the company in the target country			+
Identifying and taking into account language and cultural differences	+	+	+
Financing export activities	+	+	+
Explaining Incoterms rules	+	+	
Building long-term partnerships	+		
Logistics planning	+	+	
Protecting intellectual property	+	+	+
Features of receiving payment	+	+	+
Insuring against non-payment			+
Preparing for export activities		+	
Developing additional knowledge	+	+	+

Source: compiled by the author using [Bernard et al., 2007; Casas et al., 2017; Fedotova et al., 2023; Tsyganov et al., 2024].

indicative list of areas that are relevant for providing consulting services for each type of exporters.

It should be emphasised that in scientific publications [Vasilchenko, Sapir, 2021; Nalbandyan, 2022; Sidorov, 2023; Belas et al., 2024; Mai Xuan, Le Tan, 2024; Wang et al., 2024], the authors identify a number of barriers to entering foreign markets for SMEs. Among the most significant issues are: insufficient knowledge of demand and consumer preferences in the target market; insufficient qualifications of personnel to organise export activities; lack of international experience; high competition in the foreign target market; lack of partners, agents, distributors in the foreign market; logistical problems; etc. In addition, due to existing sanctions, the problem of making international payments for exported goods has become particularly pressing.

Overcoming the above and other barriers can be achieved through providing a comprehensive range of consulting services. For instance, insufficient knowledge about demand and consumer preferences in the target market; insufficient qualifications of personnel to organise export activities; and a lack of international experience, can be addressed through providing exporters with consultancy services in the following areas:

– the substantiation of market potential aims to identify opportunities to increase export volumes in order to increase the share of the selected market (including research into the dynamics of GDP, GDP per capita, and average income in the country; the quantity and cost of similar products and services consumed in the market under study, as well as the volume of imports of such products and services, etc.);
– assessment of tariff and non-tariff restrictions in the current conditions of sanctions pressure and uncertainty (including taking into account tariffs and tariff quotas, rules of origin, the country's main requirements for products on the market: verification of standards, mandatory and voluntary certification, design, expectations, language features, color, symbols, etc.);
– protection of intellectual property (including by providing information on the advantages and disadvantages of standard types of intellectual property, as well as familiarisation with the procedure for filing applications and the documents required to obtain a title of protection in various countries);
– development of additional knowledge (including through familiarisation with current educational events and programs aimed at expanding the recipient's knowledge of export promotion services, developing human capital and strengthening the skills and competencies of SMEs necessary for participation in international trade).

Barriers such as a lack of partners, agents, distributors in the external market, and logistical problems, can be mitigated by providing relevant consulting services on:

– logistics planning taking into account the specifics of independent supply chain management (including consultations on the specifics of coordinating freight rates, creating transportation schedules, preparing shipping and export documentation in the face of existing uncertainty, etc.) or by engaging third parties (for example, a freight forwarding company);
– preparation of export activities includes providing information on the list of necessary documentation for transportation of goods depending on the chosen mode of transportation and assistance with checking the correct execution.

The elimination of the barrier 'Difficulties in conducting international settlements as a result of the imposition of sanctions' can be achieved through the provision of consulting services on:

– the specifics of receiving payment for international sales, especially in view of imposed sanctions, include such aspects as the currency in which invoices are issued, payment terms (prepayment, credit) and payment methods, etc.;
– insurance against non-payment, including provision of information on the specifics of legal norms related to making payments in the target country, payment methods that provide a greater degree of security, the specifics of purchasing insurance to cover the risk of non-payment etc.;
– financing of export activities through providing information on available options for attracting, securing, and using financial resources to carry out export operations.

It should be noted that the same recipient of consulting services may switch from one exporter type to another during the development of their enterprise, which will determine the need for different types

of services. In addition, the list of areas provided by the type of exporter is not exhaustive and may be amended depending on industry and regional characteristics of the exporting company. It also does not define the priority of tasks, but can serve as a reference list to focus on aspects that are important for the company when providing consulting.

Conclusion

The paper presents directions for improving consulting service content to effectively develop export entrepreneurship under uncertainty. This focuses on two aspects: popularising and assisting with the implementation of organisational ambidextrity principles, which should ultimately improve the financial performance of small and medium businesses involved in foreign trade and make them more predictable and stable for business owners; and differentiating consulting services based on the stage of a firm's life cycle and its experience in exporting, ensuring clarity, appropriateness, and timeliness in support provided to exporting firms.

The proposed recommendations can be used as a basis for adjusting the content of consulting services for exporters to help them avoid difficulties and minimise errors in selling their products. They also help to optimally use resources when entering international markets. A promising area for further research is the substantiation of factors affecting customer satisfaction when receiving services from consulting companies in the field of export entrepreneurship. This includes the formation of economic and mathematical models to identify the direction and strength of relationships between these factors.

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Analysis of the international competitiveness of the automotive industry in the age of artificial intelligence

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Abstract
The article examines the international competitiveness of the automotive industry in China, Germany, Japan and the United States, considering the impact of artificial intelligence and related technologies. The main goal is to identify the key competitive factors in the era of digitalisation and evaluate their impact on the strategy of automotive corporations. A statistical analysis and a correlation measurement model were used. In this new paradigm, success is not determined by the size of the corporation or its historical heritage, but by its ability to quickly adopt and implement technological solutions that will shape the future of mobility. The introduction of artificial intelligence in production and products is recognised as the most important factor in increasing the competitiveness of goods and services. Other factors include innovation, adaptability to market changes, integration of sustainable practices and digital transformation. Based on a comparative analysis of leading corporations, recommendations are proposed to strengthen positions in the global market segment. The results of the study will be useful for automotive corporations, as well as for government and non-profit organisations that support the industry.
Keywords: international competitiveness, automotive industry, artificial intelligence

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分析智能时代汽车业的国际竞争力

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简介
文章研究了中国、德国、日本和美国汽车行业在人工智能及相关技术影响下的国际竞争力。主要目的是找出数字化时代竞争力的关键因素，并评估其对汽车企业战略的影响。研究采用了统计分析和相关测量模型。在这种新模式下，成功与否并不取决于企业的规模或历史传承，而是取决于企业能否快速适应和应用技术解决方案，从而塑造未来的移动性。在生产和产品中引入人工智能已被公认为提高商品和服务竞争力的最重要因素。其他因素包括创新性、对市场变化的适应性、可持续实践的整合以及数字化转型。在对领先企业进行比较分析的基础上，提出了加强在全球细分市场中的地位的建议。研究结果对汽车企业以及支持该行业的政府和非营利组织都很有用。这项工作的新颖之处在于采用综合方法分析竞争力，并将人工智能技术考虑在内，为全球汽车制造商的战略发展提供了新的视角。
关键词： 国际竞争力、汽车行业、人工智能

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Introduction

In an era of rapid technological development and artificial intelligence, the international competitiveness of the automotive industry is of particular importance. Globalisation and market integration present new challenges that require corporations to adapt and actively implement innovative technologies in order to lead the global race.

As one of the most technologically advanced industries, the automotive sector is reconsidering its strategies in the context of digitalisation. Competition is intensifying in terms of both products and services and automated production processes [Bityutskaya, Klochko, 2020]. Artificial intelligence is applied at every stage, from model design to logistics and servicing. Companies investing in AI technologies such as autonomous driving, intelligent safety systems and adaptive interfaces are setting industry standards and taking leading positions [Volkov, Rotkin, 2024].

At the same time, the industry must become more flexible and adaptable. Accelerating innovation cycles, transitioning to sustainable production processes, and meeting the demand for green transport are all key to success. Data analysis is crucial for strategic planning, enabling more accurate demand forecasting, improved quality and increased customer satisfaction [Akhmedov, 2022].

The integration of advanced technologies and adaptability provide a competitive advantage on a global scale. Innovative activity, strategic partnerships, and the ability to manage change flexibly are the main drivers of the industry's growth and sustainable development [Rybakov et al., 2021].

Studying the global competitiveness of the automotive industry in the artificial intelligence era enables us to identify trends, predict changes, and develop effective strategies to achieve sustainable leadership [Voropaeva et al., 2022].

1. Market description and research methodology

In the 21st century, the automotive industry is on the threshold of a new era where artificial intelligence, advanced technological solutions, and sustainable development are the main driving factors. In this digital age, where technology is deeply embedded in all aspects of life, evaluating the global competitiveness of the automotive industry necessitates a fresh perspective that considers innovation, environmental responsibility, and the evolving landscape of consumer preferences [Ogneva, 2024].

Since its inception, the automobile industry has been one of the foundations of the world economy. Since Henry Ford's assembly line produced the first cars, the industry has consistently developed, introducing new technological solutions and expanding international markets. The exchange of engineering knowledge and production technologies between countries has contributed to the formation of a global competitive environment, in which each manufacturer seeks not only to follow trends, but also to get ahead of them [Teshaboev, 2021; Tishchenko, 2021].

Currently, the world's leading automobile manufacturing countries are employing a variety of strategies to boost their competitiveness. Germany, for example, emphasises engineering innovation and high quality standards; Japan focuses on improving hybrid technologies; and the United States prioritises the mass production of electric vehicles and infrastructure development. Meanwhile, the Chinese automobile industry is actively developing the market through aggressive expansion and government support [Antipova, 2024].

The Age of Intelligence is opening up new horizons for the automotive industry, but it is also forcing us to rethink our approach to competition. Those corporations that can adapt by investing in research and development and establishing sustainable production and environmental processes will strengthen their position in the global market and become leaders of the new technological era [Varshavsky, Dubinina, 2020]. It is important to remember that true competitiveness is determined not only by economic success, but also by a company's contribution to societal, environmental and quality-of-life development [Volkov, Rotkin, 2024].

The automotive industry is recognised as one of the key sectors of the global economy, with significant differences in its development across different countries. Leading participants in global auto production include China, Germany, Japan and the United States. Each of these countries has its own unique automotive industry development history and specifics, which determine their current market position and future growth prospects [Smelkov et al., 2024].

China maintains a leading position in the global automotive industry in terms of production and sales. This success is largely thanks to the country's rapid economic growth, which has been supported by the government [Zhang, 2024]. China's auto industry is characterised by its ability to swiftly adopt new technologies and adapt to current trends. Consistent with the national strategy to reduce environmental impact and dependence on foreign petroleum products, Chinese companies are investing heavily in the development of electric and autonomous vehicles [Liu, 2024].

A notable characteristic of the Chinese market is its size. However, local manufacturers face challenges such as improving the quality of their products and strengthening their competitive position in both the domestic and global markets (Lu, 2024). In recent years, Chinese brands have begun to expand into overseas markets, but they have yet to earn consumers' trust in terms of quality and reliability [Gilfanova, Sakhbieva, 2022].

Germany is famous not only for its premium cars, but also for its advanced engineering and innovative technologies. German car manufacturers such as Volkswagen, BMW and Mercedes-Benz are renowned for producing reliable, high-quality vehicles. Germany is at the forefront of producing cars with internal combustion engines, and this has led to

the creation of many sub-brands and a wide range of models [Pozharskaya, Vasilyeva, 2020].

As one of the most innovative participants in the global automotive market, Japan places emphasis on impeccable quality, reliability and technological advances. Leading Japanese car manufacturers such as Toyota, Honda and Nissan are at the forefront of hybrid technology. The Toyota Prius has become a symbol of Japan's commitment to environmentally friendly solutions.

The United States has traditionally been at the forefront of the automobile industry, home to giants such as Ford, General Motors and Chrysler. The American market is renowned for its emphasis on mass production, enabling it to provide consumers with a diverse selection of models at various price points. Car enthusiasts in the United States often prefer larger vehicles, including SUVs and pick-up trucks.

The impact of international competition factors within the framework of comparative economic analysis was assessed by constructing a model of economic efficiency in the automobile industry and measuring correlation.

2. Comparative analysis

All of the countries discussed have made significant contributions to the global automotive industry, each with its own unique features and advantages. China stands out thanks to the speed with which it integrates new technologies and its production volumes, which are making it an increasingly prominent player in the global market. Germany continues to lead the way in innovation and the premium segment. Japan is renowned for the quality and variety of its exports. Meanwhile, the United States stands out for its ability to mass-produce and innovate in the fields of electronics and electric vehicles (Fig. 1).

It is important for each of these countries to strike a balance between environmental responsibility, economic efficiency, and technological innovation. Global trends, such as the shift towards renewable energy sources and the digitalisation of the automotive industry, mean that manufacturers must be flexible and ready to adapt quickly [Goncharova et al., 2023].

In this study, mathematical analysis tools were used to analyse the data and construct graphs displaying the dynamics of production and sales in the automobile industries of China, Japan, Germany and the United States. The STATA programme was used for modelling [Demurcheva, 2022].

The analysis indicates that the economic efficiency of car production and sales will decrease in the future due to rising costs and the impact of renewable energy.

A weight graph was constructed for the *i*-th member of the exponential smoothing series based on the results of the analysis (attenuation factor = 0.8) (Fig. 2) [Kamenev, Zambrzhitskaya, 2024].

As the analysis showed, the cost of producing and selling cars is increasing due to higher demand.

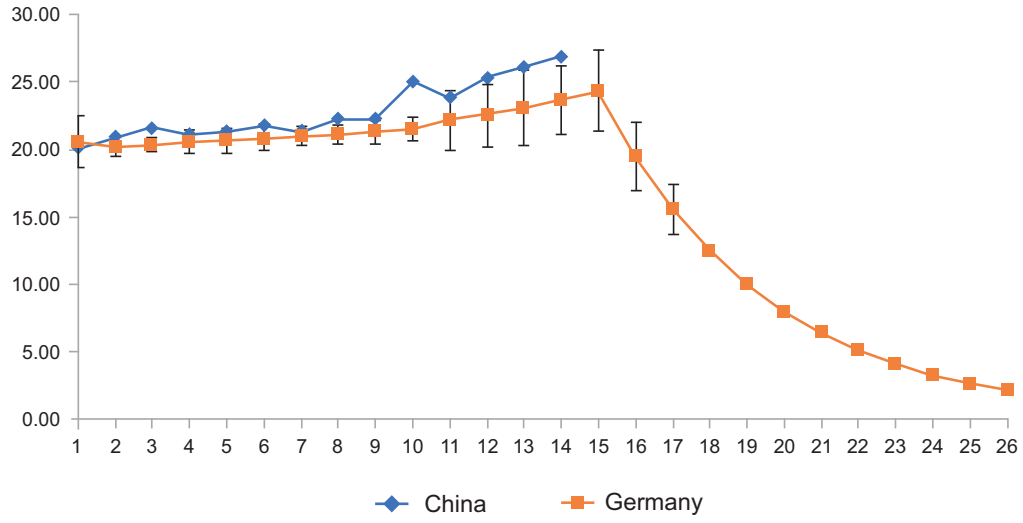
A weight graph was constructed for the *i*-th member of the exponential smoothing series based on the results of the analysis (attenuation factor = 0.6) (Fig. 3). According to the analysis, producing and selling cars is economically efficient due to demand from other countries. Based on these results, a weighted graph was constructed for the *i*-th member of the exponential smoothing series (attenuation factor = 0.7) (Fig. 4).

Financial security is recognised as a key factor in implementing project decisions for transport infrastructure development.

A weight graph was constructed for the *i*-th member of the exponential smoothing series based on the results of the analysis (attenuation factor = 0.8) (Fig. 5).

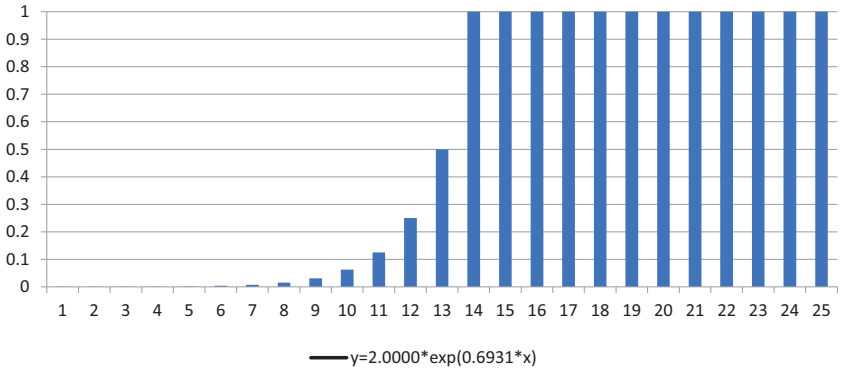
A weight graph was constructed for the *i*-th member of the exponential smoothing series based on the results of the analysis (attenuation factor = 0.8) (Fig. 6).

Fig. 1. Dynamics of car production volume in different countries



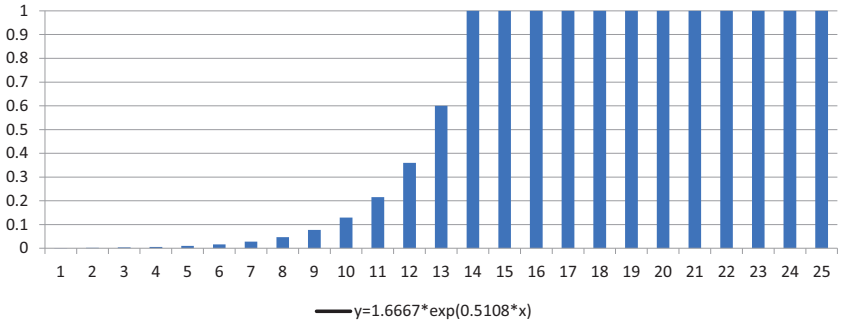
Source: compiled by the authors..

Fig. 2 Graph of weights for the *i*-th term of the exponential smoothing of the economic efficiency in automobile sales, taking into account the planning efficiency factor (attenuation factor = 0.5)



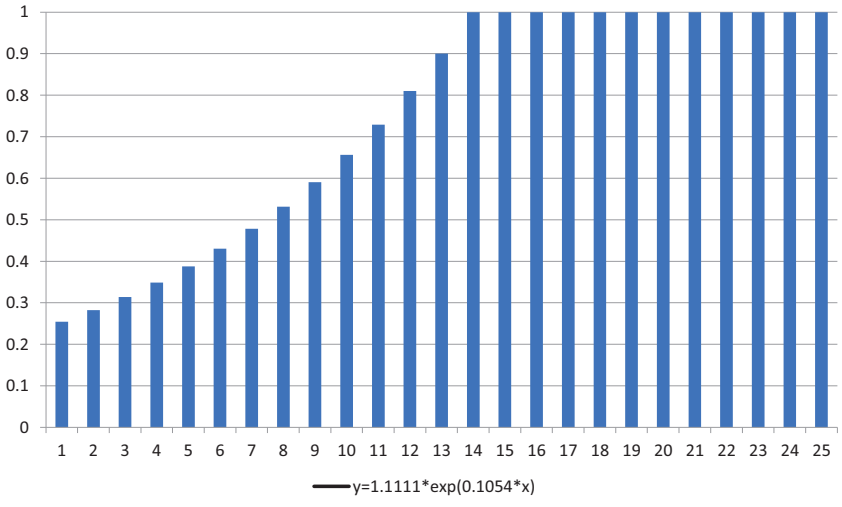
Source: compiled by the authors

Fig. 3. Graph of weights for the *i*-th member of the exponential smoothing series (attenuation factor = 0.6) for the economic efficiency of producing and saling cars, taking into account the efficiency factor of CA planning



Source: compiled by the authors.

Fig. 4. Graph of weights for the *i*-th member of the exponential smoothing series (attenuation factor = 0.7) for the economic efficiency of producing and saling automobiles taking into account the factor of financial security



Source: compiled by the authors.

The car industries in China, Germany, Japan and the United States take different approaches to innovation, production processes and marketing, reflecting the unique economic and cultural characteristics of each country.

They are united by a desire to improve technology, act in an environmentally responsible manner, and meet the needs of their target audience. In today's rapidly changing global economy, the ability to adapt and implement cutting-edge solutions is becoming a key factor for all major market players.

3. Factor economic analysis

This study analyses the formation of automobile production prices from 2004 to 2024.

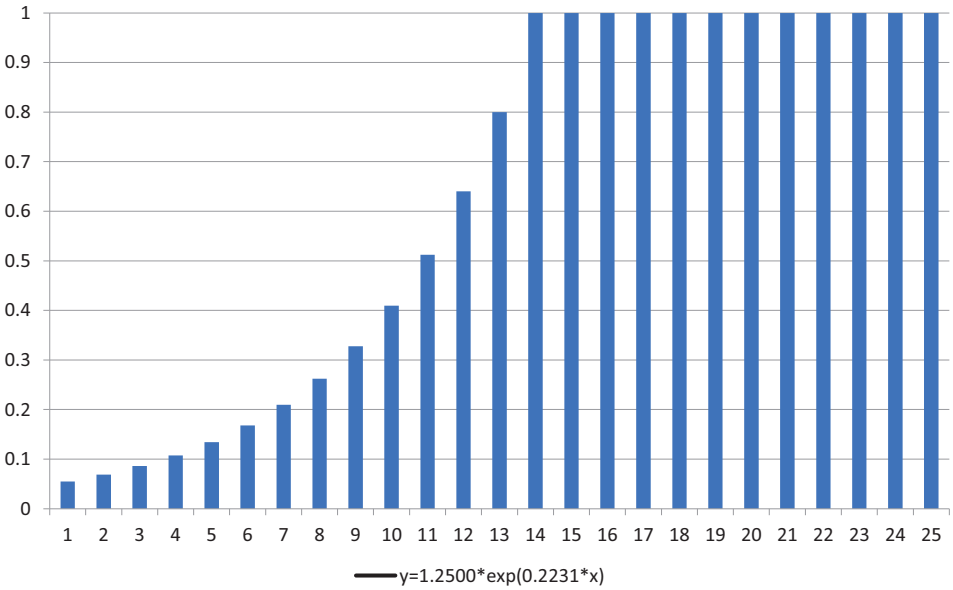
It is interesting to compare the competitiveness of the automobile industries in China, Germany, Japan and the United States, given the unique economic structures, production processes and marketing strategies that characterise each country.

These countries' competitiveness is determined by their ability to adapt to the global market, invest in innovation, and strike a balance between quality and cost. As the global automotive industry becomes more integrated, each country is contributing by promoting unique, sustainable growth strategies and taking leading positions in technology.

China, once seen as a cheap manufacturing hub, is now making strides towards technological leadership. The country is focusing on electric vehicles and autonomous technologies, supporting these areas through research and government initiatives. Companies such as BYD and NIO are strengthening their positions not only in the domestic market, but also competing confidently with Western corporations on the global stage.

Renowned for its quality and engineering innovation, Germany places emphasis on sustainable manufacturing and the development of electric vehicles. Volkswagen, BMW and Mercedes-Benz are investing heavily in clean technology, aiming to reduce their carbon footprint while remaining at the forefront of technological development. The practical and meticulous nature of the German

Fig. 5. Graph of weights for the *i*-th member of the exponential smoothing series (attenuation factor = 0.8) for the economic efficiency in car production and sales, taking into account the factor of project budget management



Source: compiled by the authors.

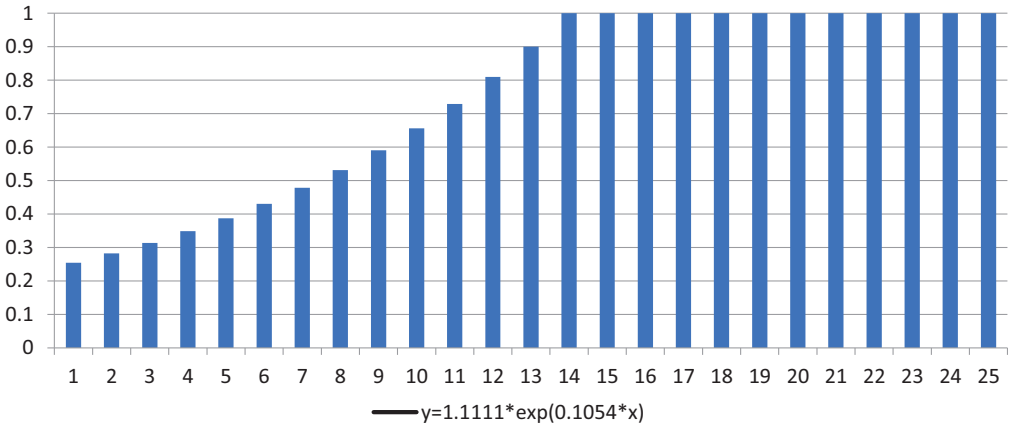
automobile industry helps it to maintain its status as a top-notch manufacturer.

Japan's unique manufacturing approach and Kaizen philosophy of continuous improvement mean it is focusing on hybrid technology and product reliability. Leading the hybrid segment are companies such as Toyota and Honda, which influence global trends and set quality standards. Japan's commitment to developing hydrogen energy further highlights its focus on innovation and environmentally friendly solutions.

The United States remains a key player in the global economy, with its automotive industry historically symbolising economic power and technological innovation. Companies such as Ford and General Motors are modernising their manufacturing processes aggressively to meet modern market demands, with a particular focus on electrification. Additionally, companies such as Tesla are driving disruption and significantly influencing the global automotive agenda and the cost of battery technology.

The development of artificial intelligence, blockchain and Internet of Things (IoT) technologies has fundamentally transformed the way automobiles are manufactured and operated. Automakers that successfully integrate these technological solutions will lead their market segment. Using deep and machine learning algorithms optimises design and engineering processes, significantly reducing the time and cost of bringing a new product to market. Particular attention should be paid to the development of autonomous vehicles, which represent the pinnacle of the industry's intellectual achievements.

Fig. 6. Weight graph for the *i*-th exponential smoothing series (attenuation factor = 0.8) of the economic efficiency of automobile production and sales, given the cost control factor



Source: compiled by the authors.

In the era of the Fourth Industrial Revolution, the automotive industries of China, Germany, Japan and the United States are facing a new era of international competitiveness. These are determined by rapid technological change and geopolitical challenges, as well as rising consumer expectations for sustainable, intelligent vehicles.

The following conclusions can be drawn based on the constructed box plots:

- influence automobile production, such as export volumes, investment in innovation, and the introduction of environmentally friendly technologies. This suggests that there are significant differences in the strategies adopted by different countries to develop their automobile industries.
- abnormal values are present.

ДWe will conduct a correlation analysis on the original data array. For this, we will use the corr() function from the Python Pandas data library (Fig. 7).

We will also check the correlation coefficients for significance. To determine the significance of the correlation coefficient, we will use the Student's *t*-test. In this test, we will test the hypothesis that the correlation coefficient is equal to zero.

We will also conduct a correlation analysis of data on the production process and car sales (Fig. 8).

Today's consumers are increasingly aware of the impact their vehicle choices have on the environment. This has led to an increased demand for environmentally friendly technologies, such as electric and hydrogen-powered engines. By strategically integrating these developments into their production processes, corporations can not only comply with environmental regulations, but also capture new markets, making their products more attractive to environmentally conscious consumers. (Figure 9).

Let's calculate the estimates of $\hat{a}_0$, $\hat{a}_1$, $\hat{a}_2$, $\hat{a}_3$, $\hat{a}_4$, $\hat{a}_5$, $\hat{a}_6$, $\hat{a}_7$ and S_{ELR} or the parameters of the linear regression model. To do this, we can use the Regression tool by selecting the appropriate menu item in the Data Analysis add-on of Microsoft Excel (Fig. 10).

Based on the analysis results, a graph was created using exponential smoothing (attenuatuion factor = 0.5) (Fig. 11).

Улучшение управления цепочками поставок с помощью Improving supply chain management through the use of smart technologies plays a crucial role in reducing risks and optimising logistics processes. With economic stability often at risk in today's global market, flexibility and the ability to adapt quickly are becoming essential factors for creating a competitive advantage. The choice of countries for placing production facilities and resources for automobile corporations significantly impacts their ability to stay competitive in the market. An exponential smoothing graph (damping factor = 0.6) was created based on the analysis (Fig. 12).

As the analysis shows, with the increase in production and transportation volumes, the cost of maintaining the transport infrastructure also increases. Based on the results of the analysis, an exponential smoothing graph was created

Fig. 7. Correlation analysis of economic efficiency factors in car production

	Y	X1	X2	X3	X4	X5	X6	X7
Y	1.000	0.667	-0.016	0.087	0.322	-0.666	-0.489	0.615
X1	0.667	1.000	-0.105	-0.190	0.045	-0.505	-0.274	0.483
X2	-0.016	-0.105	1.000	0.184	0.046	0.046	-0.270	0.111
X3	0.087	-0.190	0.184	1.000	0.242	-0.233	-0.424	0.313
X4	0.322	0.045	0.046	0.242	1.000	-0.258	-0.310	0.313
X5	-0.666	-0.505	0.046	-0.233	-0.258	1.000	0.507	-0.490
X6	-0.489	-0.274	-0.270	-0.424	-0.310	0.507	1.000	-0.573
X7	0.615	0.483	0.111	0.313	0.313	-0.490	-0.573	1.000

High positive correlation; Weak positive correlation; Average positive correlation; Negative correlation

Source: compiled by the authors.

Fig. 8. Correlation map for car sales data

	Y	X1	X2	X3	X4	X5	X6	X7
Y	1.000	0.643	-0.004	0.100	0.306	-0.648	-0.537	0.605
X1	0.643	1.000	-0.448	-0.197	0.040	-0.490	-0.335	0.480
X2	-0.004	-0.448	1.000	0.493	0.107	-0.051	-0.190	0.084
X3	0.100	-0.197	0.493	1.000	0.246	-0.260	-0.457	0.327
X4	0.306	0.040	0.107	0.246	1.000	-0.182	-0.286	0.260
X5	-0.648	-0.490	-0.051	-0.260	-0.182	1.000	0.617	-0.449
X6	-0.537	-0.335	-0.190	-0.457	-0.286	0.617	1,000	-0.613
X7	0.605	0.480	0.084	0.327	0.260	-0.449	-0.613	1.000

High positive correlation; Weak positive correlation; Average positive correlation; Negative correlation

Source: compiled by the authors.

Fig. 9. Correlation map for competitiveness data

	Y	X1	X2	X3	X4	X5	X6	X7
Y	1.000	0.672	-0.014	0.059	0.219	-0.697	-0.540	0.579
X1	0.672	1.000	0.000	-0.182	0.015	-0.538	-0.338	0.498
X2	-0.014	-0.000	1.000	-0.030	-0.114	0.008	0.385	-0.137
X3	0.059	-0.182	-0.030	1.000	0.295	-0.257	-0.425	0.356
X4	0.219	0.015	-0.114	0.295	1.000	-0.183	-0.291	0.274
X5	-0.697	-0.538	0.008	-0.257	-0.183	1.000	0.674	-0.492
X6	-0.540	-0.338	0.385	-0.425	-0.291	0.674	1.000	-0.588
X7	0.579	0.498	-0.137	0.356	0.274	-0.492	-0.588	1.000

High positive correlation; Weak positive correlation; Average positive correlation; Negative correlation

Source: compiled by the authors.

Fig. 10. Regression analysis result

ВЫВОД ИТОГОВ

ессионная статистика								
Множеств	0,815719							
R-квадрат	0,665398							
Нормиров	0,634168							
Стандартн	25724,62							
Наблюден	83							
Дисперсионный анализ								
	df	*SS*	*MS*	*F*	*ачимость F*			
Регрессия	7	9,87E+10	1,41E+10	21,30666	1,6E-15			
Остаток	75	4,96E+10	6,62E+08					
Итого	82	1,48E+11						
	Коэффициен	*артная ош*	*татистик*	*P-Значение*	*ижние 95%*	*ерхние 95%*	*ижние 95,0*	*рхние 95,0*
Y-пересеч	141151,1	384639,6	0,36697	0,714675	-625090	907392,5	-625090	907392,5
Среднеду	1,549299	0,390438	3,968101	0,000164	0,771506	2,327092	0,771506	2,327092
Индекс пс	-424,442	3604,181	-0,11776	0,90657	-7604,34	6755,455	-7604,34	6755,455
Доля обо	-224,582	369,1571	-0,60836	0,544784	-959,981	510,8168	-959,981	510,8168
Обеспече	66,95394	33,19689	2,016874	0,047288	0,822339	133,0855	0,822339	133,0855
Доля насе	-2759,85	818,7329	-3,37088	0,001187	-4390,85	-1128,85	-4390,85	-1128,85
Уровень б	-768,483	753,1918	-1,0203	0,310865	-2268,92	731,9517	-2268,92	731,9517
Доля горс	644,6361	304,6531	2,115967	0,037667	37,73588	1251,536	37,73588	1251,536

Source: compiled by the authors.

(damping factor = 0.7) (Fig. 13). Based on the analysis results, an exponential smoothing graph was constructed (damping factor = 0.8) (Fig. 14).

As the analysis shows, controlling costs allows optimising expenses for the production process and sale of cars. Based on the results of the analysis, an exponential smoothing graph was created (damping factor = 0.9) (Fig. 15).

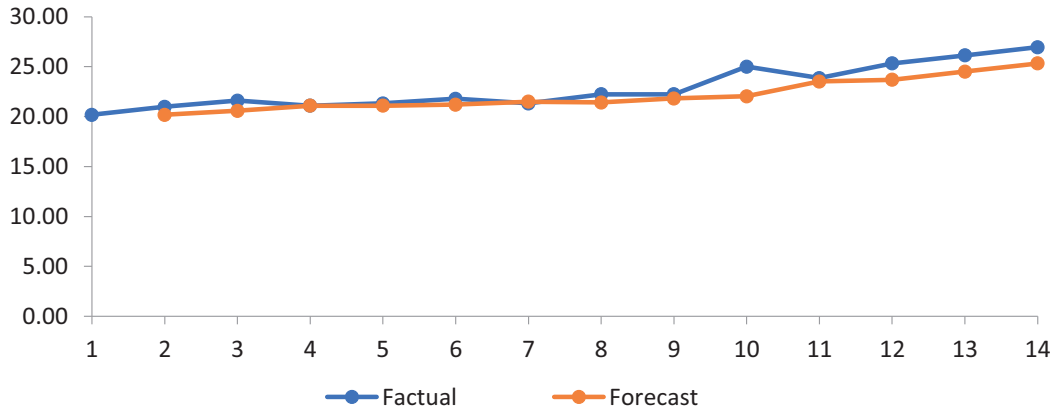
Changing lifestyles and consumer preferences are influencing the automotive industry. Safety, comfort, and integration of connected technology are making cars more attractive to the next generation of users. Understanding what influences individual choice can help corporations anticipate and set trends.

At the forefront of this intelligent disruption is China, which has firmly established itself on the global automotive stage thanks to its large-scale manufacturing processes and innovations in automation and artificial intelligence. Chinese corporations are heavily investing in research and development, supported by government programs such as 'Made in China 2025'. The electric vehicle market in China is expanding rapidly, helping to position the country as a leader in this sector.

The United States continues to lead the way thanks to its strong innovation ecosystem, which is primarily located in Silicon Valley. American companies such as Tesla and Ford are actively developing electric and connected vehicle technology solutions, providing unique solutions for integrating transportation and the Internet of Things. These solutions include intelligent infotainment features and advanced automatic driving assistance functions.

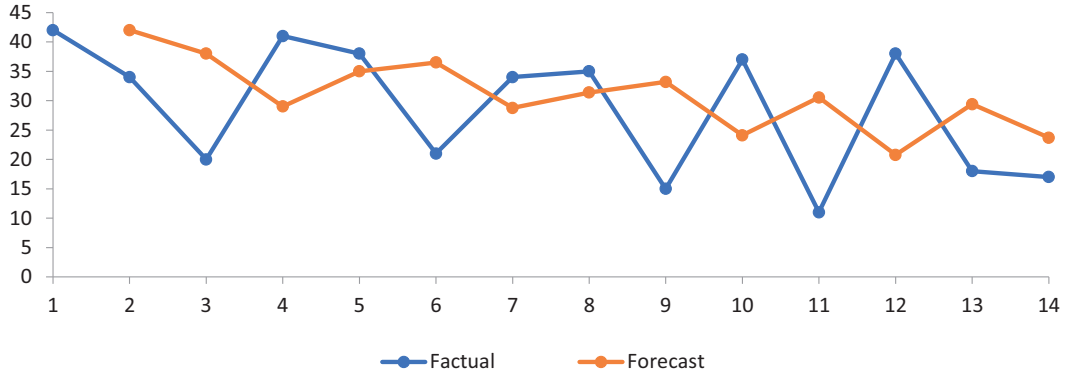
Thus, the international competitiveness of the automotive industry today depends not only on traditional production factors, but also on the ability to adapt and implement intelligent technological solutions. These unique national and regional strategies form the basis for the future

Fig. 11. Exponential smoothing plot (attenuation factor = 0.5) of China's automobile production and sales



Source: compiled by the authors.

Fig. 12. Exponential smoothing plot (ϕttenuation factor = 0.6)
of Japanese automobile production and sales



Source: compiled by the authors.

of the global automotive sector. Innovation and intelligence are key drivers of growth and development in this complex field.

Conclusion

A factor economic analysis of competitiveness in the automotive industry during the age of intelligent technology highlights the importance of adaptability and innovative technologies. Growth and success will depend on corporations' ability to effectively integrate intelligent technological solutions, taking into account environmental and social trends and the ability to quickly adapt to changing conditions on the global market. Only those who are able to adapt with the times will be able to maintain their leadership position in this new reality.

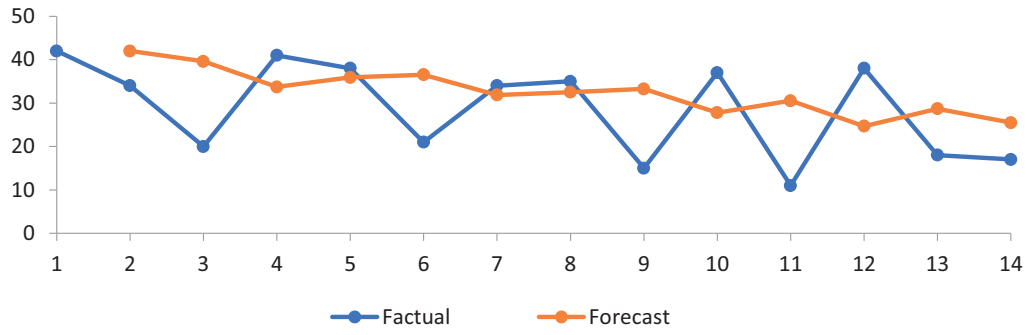
In an age of rapid technological innovation and globalisation, the automotive industry is undergoing a fundamental change. Traditionally, competitiveness has been based on factors such as production capacity, labor costs, and geographical advantages. However, this is giving way to new criteria driven by smart technologies. Success in this new paradigm is not determined by the size or historical legacy of a company, but rather by its ability to adapt quickly and apply innovative solutions that shape the future of transportation [Asmolov et al., 2024] .

Artificial intelligence and automation are key to competitiveness in the industry. The future of automobiles, especially with the development of autonomous driving, requires manufacturers to have deep expertise in machine learning, computer vision, and real-time data analysis. Automakers who can integrate these technological solutions into their manufacturing processes will gain a significant advantage by reducing costs and improving product quality [Shukurov et al., 2020].

Research and development are becoming the main driver of competitiveness. Corporations in China, Germany, Japan and the US need to invest heavily in innovation to create cars that are not only technically advanced but also meet changing consumer expectations. Manufacturers that focus on sustainable energy, electric vehicle development and safety improvements have a better chance of success given the growing emphasis on sustainability and safety among their audiences.

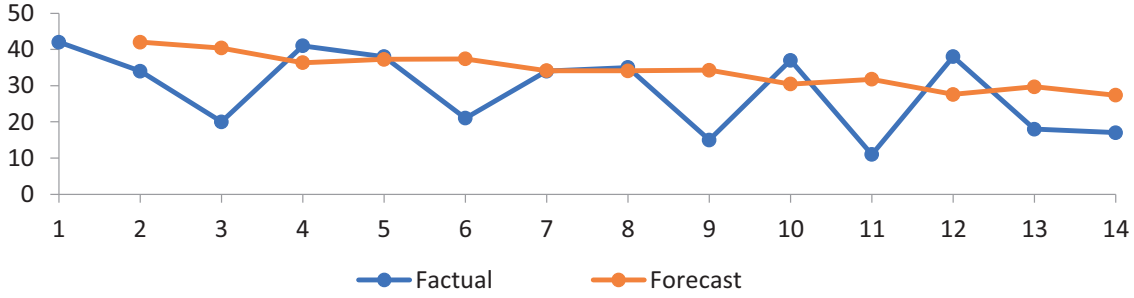
Digital transformation of all stages of the vehicle lifecycle, from concept development to after-sales service, has been recognised as an essential factor in maintaining competitiveness. By using intelligent data analysis, corporations can predict consumer behaviour, optimise supply chains, and manage production processes more effectively, leading to higher quality standards and increased customer satisfaction.

Fig. 13. Exponential smoothing plot (attenuation factor = 0.7)
of German car production and sales



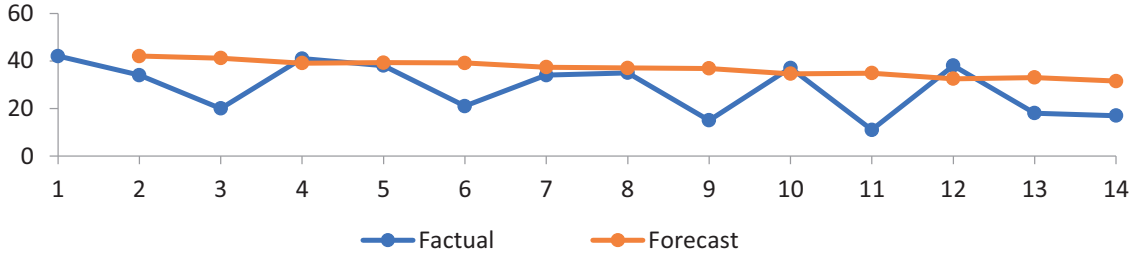
Source: compiled by the authors.

Fig. 14. Exponential smoothing plot (attenuation factor = 0.8) of US auto production and sales



Source: compiled by the authors.

Fig. 15. Exponential smoothing plot (attenuation factor = 0.9) showing the profitability of auto production and sales in China, Germany, Japan and the United States



Source: compiled by the authors.

Moreover, competitiveness in the age of intelligence is determined by the ability to produce not just vehicles, but complex digital ecosystems. Consumers expect not only physical products, but also their integration with digital services, such as navigation, multimedia systems, or the ability to connect to the internet of things. Corporations that are able to create smart cars connected to a ecosystem of technologies and services will be at the forefront of the industry.

Thus, the competitiveness of the automobile industry in China, Germany, Japan, and the United States during the era of intelligent transportation requires flexible adaptation to change, implementation of advanced technologies, and a deep understanding of rapidly evolving market landscapes. Only those companies that master these trends and turn challenges into new opportunities will be able to withstand fierce competition and shape the future of the industry.

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Company's strategic orientations: Theoretical review and development of conceptual foundations

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Abstract
The article examines the theoretical aspects of the concept of strategic orientations of a company: the "classical" types of strategic orientations that are most applicable by companies are given, their components are analyzed and the development of knowledge about this concept is periodized. Modern environmental factors explaining the emergence of new types of strategic orientations of the company are also considered, with a brief description of these new types of strategic orientations. Based on the identification of current trends in the environment and the analysis of literature, the article concludes that a new historical stage in the development of the concept of strategic orientations of the company has been identified and the existing periodisation of this concept has been adjusted, which contributes to the theoretical development of knowledge about strategic orientations..
Keywords: entrepreneurial orientation, learning orientation, market orientation, efficiency, contextualization, complementarity, digital orientation, social value orientation

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企业的战略取向：理论回顾与概念框架的发展

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简介
文章论述了企业战略导向概念的理论方面：给出了企业最常用的"经典"战略导向类型，分析了其构成要素，并对这一概念的知识发展进行了时期划分。文章还考虑了解释新型企业战略导向出现的现代环境因素及其简要特征。在确定当前环境趋势和文献分析的基础上，文章得出结论：确定了企业战略导向概念发展的新历史阶段，并对这一概念的现有时期划分进行了调整，这有助于发展有关战略导向的理论知识。
关键词: 创业导向、学习导向、市场导向、效率、情境化、互补性、数字化导向、社会价值导向

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The constant struggle for high competitive positions on the market, globalisation processes, and the ever-growing number of 'black swan' events encourage modern companies to continually search for sustainable competitive advantages. The key instruments in this regard are, first and foremost, innovation generation and the identification of new methods to attract and retain clients, in order to anticipate the latent needs of the intended audience and achieve long-term high financial performance indicators. Positive results of organisational functioning can only be achieved through a long-term strategy - a strategy that defines the dynamics of a company's relationship with the environment and the actions needed to achieve goals and improve efficiency through rational use of resources. There are many concepts in strategic management aimed at solving company problems, but most of them don't allow:

– to conduct an analysis/comparison of organisations that have chosen the same strategy;
– to combine several strategies simultaneously within the framework of the activities of one company.

In this regard, modern researchers focus special attention on the concept of strategic orientation of a company as a tool that can solve the above-mentioned problems. Therefore, the aim of this study is to analyse theoretically the concept of company strategic orientation and identify key trends in modern research in this area.

Strategic management as a science has been actively developed in the 20th century, when a large number of concepts have been formed. Thus, in the 1980s, a so-called 'resource-based' approach gained popularity, which considers companies as a 'bundle of resources'. J. Barney considers corporate resources in a broad sense and includes knowledge, information, organisational processes, human resources, and other assets in his list [Barney, 1991]. Meanwhile, D. Collis and S. Montgomery allow classifying resources as strategically significant based on consistency with several criteria, including:

- Uniqueness, defined as the difficulty of copying a resource by competitors due to barriers to duplication of strategic resources;
- Durability, expressed in the period during which a strategically important resource can maintain its invulnerability;
- Compliance - a factor that determines whether a strategically significant resource belongs to an organisation and protects it from 'leakage';
- Replaceability - the ability to use alternative sources instead of unique resources;
- Competitive superiority of a strategical resource over its competitors' analogues. [Collis & Montgomery, 1997].

The key task of the organisation within the framework of the resource-based approach is to form and further improve strategically significant resources. This can be achieved through reinvesting in available assets and developing resources as a response to the dynamics of the external environment of the company. The positive effect of operating in accordance with this approach is significant, expressed in creating an effective strategy and providing increased value for clients through acquiring a sustainable competitive advantage based on strategically significant resource development and combination. In the long term, the combination of the described advantages should also affect the company's market share and performance indicators. It is a resource-based approach that allows the company to set the vector of generating and improving strategically significant resources, which in turn creates conditions for forming certain patterns of organisational behaviour in terms of the strategic direction. This fully fits into the logic of the concept of strategic orientation of the company, which has gained popularity at the current stage of development in strategic management. The start of the development of this concept was laid by N. Venkatraman in 1986, who defined strategic orientation as a collection of means to achieve organisational business goals [Venkatraman, 1996]. Later, with the growing interest in the concept, other interpretations of the term 'strategic orientation' began to appear. Thus, the authors of the article [Gatignon and Xuereb] defined the strategic orientation of a company as following the principles and practices of organisational behaviour developed within the framework of planning and implementing a strategy that sets the priority direction for practical organisational activity over the long term. However, in general, the essence of strategic orientation can be explained by a set of features inherent in a company, such as:

- priority of the long-term activities of the company;
- expression through the rules of company functioning;
- response to the degree of dynamism in the external environment;
- desire to improve organisational efficiency indicators and achieve sustainable competitive advantage [Krzakiewicz, Cyfert, 2019].

It is noted that in its development the concept of strategic orientations has gone through three key stages:

- The first is the conceptualisation of strategic orientations.
- The second is contextualisation of these strategic orientations.
- The third is configuration of the strategic orientations.

During the first stage, conceptualisation, which lasted from the 1980s to the 1990s, scientists' key goal was to study the concept of a company's strategic orientation, determine its components and formulate a unified framework based on research conducted. As a result, three key types of strategic orientations were formed during the conceptualisation process: market-oriented,

Table
Characteristics of the components of organisational strategic orientations

Name of the company's strategic orientation	Components
Entrepreneurial orientation	Willingness to take risks Maintaining innovative activities Proactivity Competitive aggression Independence in decision making
Market orientation	Customer focus Competitive focus Coordination of organisational activities and resources Collection and study of market information Distribution of obtained market information Response to incoming market information
Learning orientation	Commitment to learning Shared vision Openness Intra-organisational knowledge sharing

Source: compiled by the author according to [Kohli, Jaworski, 1990; Narver, Slater, 1990; Covin, Slevin, 1991; Senge, 2003; Shirokova, 2012].

entrepreneurial-oriented and learning-oriented - each with its own characteristics.

Thus, it has been established that the entrepreneurial strategic orientation is primarily aimed at finding and developing innovative solutions in conditions of the manager's readiness for high-risk actions [Covin, Slevin, 1988]. The market strategic orientation reflects the company's desire to identify and maximize the value of the produced goods/services for the client, to achieve the highest level of quality within the framework of the implemented activities [Kohli, Jaworski, 1990; Narver, Slater, 1990], while the strategic orientation to learning is based on the generation, transfer and preservation of knowledge within the company for the highly effective implementation of organisational processes [Dodgson, 1993]. The specified characteristics of the types of strategic orientations are presented in detail in the table.

The table shows that each orientation type sets a specific direction for strategic action: market orientation focuses on analysing market information and responding to incoming market signals; entrepreneurial orientation shifts the emphasis toward using technology and corporate capabilities to conquer new markets; learning orientation focuses on developing knowledge.

The conceptualisation stage was not limited to describing the types of strategic orientations. It also developed the strategic orientation assessment scales that are still used today.

Thus, to assess the market strategic orientation, they resort to:

– the MKTOR scale developed by S. Narver and S. F. Slater [Narver, S. and Slater, F., 1990] allows to assess the level of customer focus, relationships with competitors, and intra-firm connectivity;
- the MARKOR scale proposed by A. Kohli, B. Jaworski and A. Kumar [Kohli, A., Jaworski, B., Kumar, A.] focuses on the efficiency of working with market information, including its collection, processing, and further use [Kohli et al., 1993].

Entrepreneurial strategic orientation is usually assessed on the basis of the Miller-Covin-Slevin scale, which measures the now classic components of entrepreneurship: innovativeness, risk readiness and level of proactivity [Miller, 1983; Covin, Slevin, 1988].

In turn, the assessment of orientation towards learning is mainly based on the postulates of organisational self-learning reflected in Table 1 by P. Senge, the founder of the theory of the self-learning organisation [Senge, 2003].

It was the development of scales for assessing types of strategic orientations that made it possible to identify empirical patterns and study the relationship between elements of strategic orientations and factors in the external and internal organisational environment. This served as the beginning of the second phase, contextualisation of strategic orientation, which lasted from late 1990s to early 2000, and involved studying the impact of environmental factors on the components of strategy and, consequently, achieving financial efficiency for the company. During this time, a significant number of studies have been conducted that have revealed the dependence of the company's strategic orientations: for example, on the type of organisational structure of the company [Covin, Slevin, 1988], the level of development of internal corporate communication, the emphasis of the company's top management in current activities and the level of employee motivation, the rate of change in technology and market information [Jaworski, Kohli, 1993] and the psychosocial parameters of the team [Escribá-Esteve et al., 2009]. The main objective of studying the context of the organisation's functioning in relation to elements of strategic orientation was to identify an optimal combination of characteristics of the external and internal environment of the company, as well as types of strategic orientations, in order to achieve better organisational results in a dynamically changing environment.

However, it is worth noting that during the second stage of the development of the concept of strategic directions for the company, priority was given to examining the impact of the environment on different types of strategies, which led to a better understanding of the fragmented nature of research into this issue. Against the backdrop of growing concerns about limited organisational resources and increasing environmental dynamism, an assumption was made regarding the potential for a synergistic outcome from combining various strategies depending on the current business circumstances.

Thus, in the late 2000s, a third stage of concept development emerged - the configuration of strategic orientations. Its purpose was to study the 'return' on different sets of strategic orientation elements in terms of their impact on financial performance indicators, such as profit and return on assets. Empirically, it was established that orientation towards learning, which is a predictor of entrepreneurial and market orientation, contributes to growth in innovative activity and ability to process market information. The combination of entrepreneurial orientation and learning orientation, in particular, can lead to increased organisational flexibility and competitive advantage.

However, despite the diversity of research in the field of contextualisation and complementarity of strategic orientations, modern research has not formed a unified position regarding the most effective types of connections between different types of strategic orientation for generating additional positive performance results.

In addition, the modern business environment is characterised by a number of trends that differ from those of the environment in the 20th century - the period when the concept of strategic orientation was formed. Thus, today, the key challenges that organisations face include:

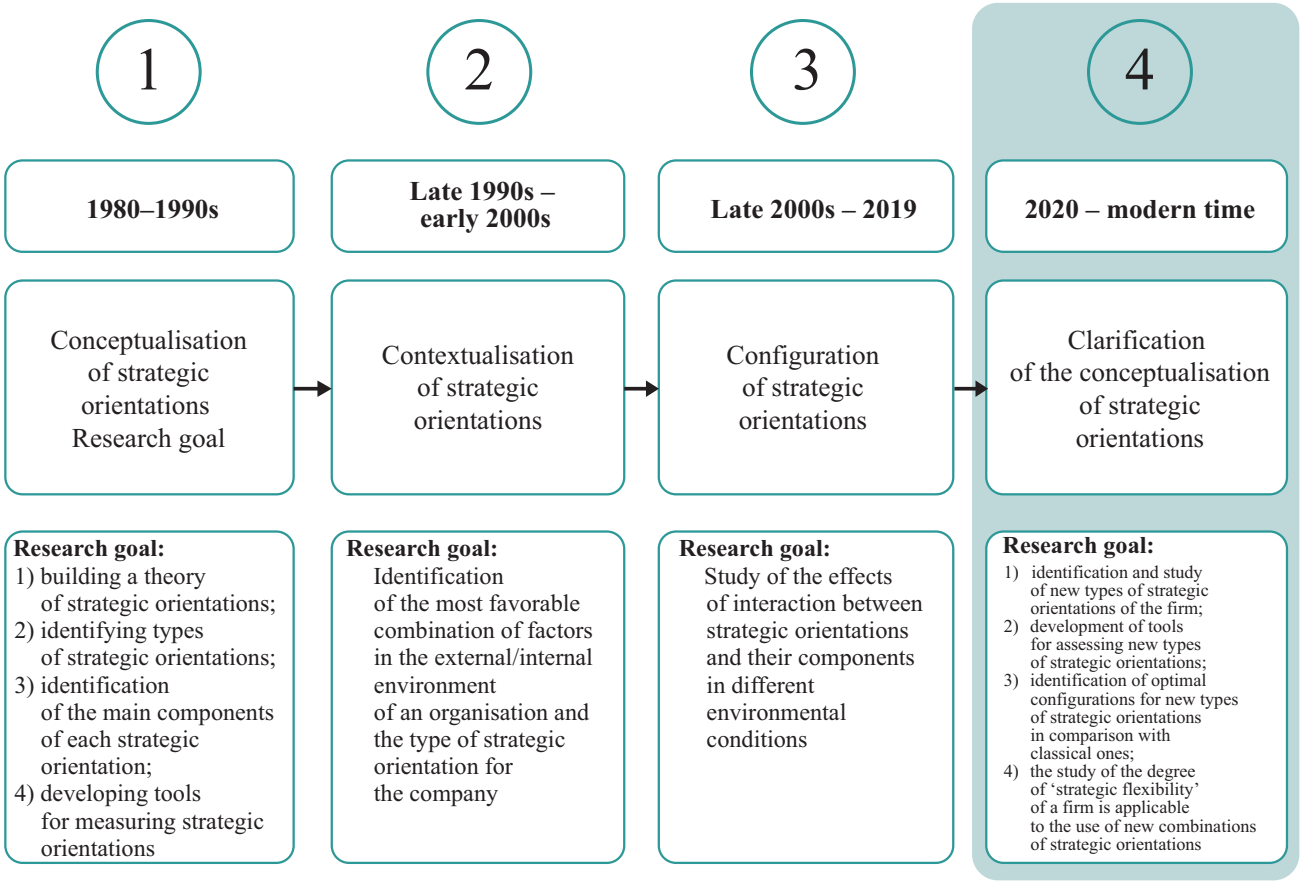
- technological progress associated with the active development of Industry 4.0, the mechanics of sanctions and the tendency of states, in particular the Russian Federation, towards forming technological sovereignty, ultimately stimulates digital transformation of companies by mass introduction of end-to-end technologies into organisational processes. Artificial intelligence, neurotechnologies and geodata are some of the categories most commonly used[1];
- a significant increase in the number of black and grey swans events against the backdrop of a challenging geopolitical environment has created increased economic and political instability. This requires organisations to develop scenario planning skills and take a proactive strategic approach to combat[2];
- increased dynamism of customer needs, manifested in an increase in the rate of change in consumer preferences, a change in the role of the client - a transition to the category of 'co-producers' within the production process [Linder, Khachaturyan, 2024] and a shift in emphasis towards the dominance of the value component, taking into account modern business development trends. The latter is expressed in support for organizations developing ESG initiatives and the desire for confidentiality of interaction with the company - the manufacturer of the goods / services as a new value of the 21st century in the context of the development of digital technologies.

All this together leads to new types of strategic orientations: digital strategic orientation, strategic value orientation, and strategic social value orientation.

Digital strategic orientation, introduced into the strategic management community in 2020 by [Kindermann et al., 2020], focuses on the effective use of digital technologies in solving strategic problems and interacting with a dynamic environment, which, in addition to saving resources, generating a competitive advantage and increasing the company's financial performance, can stimulate the development of digital knowledge in the long

[1] https://companies.rbc.ru/news/YrTl9Y1Ezv/tsifrovaya-transformatsiya-evolyutsiya-vsej-biznes-sredyi/.
[2] https://pro.rbc.ru/demo/676c3ed89a7947322d6113ca.

Fig. Clarifying the historical periods in the development of the concept of strategic orientations



Source: compiled by the author.

term [Wang et al., 2024]. However, the development of digital strategic orientation, along with the positive effects described above, may be associated with an increased risk of DoS attacks (Distributed Denial of Service) and leakage of personal data obtained from customers when interacting with the company. Therefore, strategic value orientation considered as the complete subordination of a company's processes towards providing increased value to consumers is becoming especially relevant. In the context of digital transformation, special attention has been paid recently to the confidentiality of personal data and associated reputational risks for businesses [Durans, Mainardes, 2024].

In turn, strategic social value orientation, or strategic social value orientation, emphasises the increased role of non-financial performance indicators of the organisation and the provision of product/service value to the maximum range of stakeholders directly or indirectly related to the product/service being produced [De la Cruz Jara et al., 2024].

In accordance with all of the above, it can be concluded that the third stage of the concept development - the configuration of strategic orientations - is not final, which is noted, for example, in the dissertation research of T.V. Belyaeva [Belyaeva, 2017]. Thus, the existing periodisation of the development of the concept of strategic orientations, described above, requires adjustment, according to which the third stage ends in 2019, since already in 2020 a new, fourth stage begins - clarification of the conceptualisation of strategic orientations, which is reflected in the figure.

Thus, based on the identification of a new stage in the periodisation of the concept of strategic orientations of a firm, the key objectives of research in this area in the near future should primarily be:

- detailed study of new types of strategic orientations and their elements, formed under the influence of new factors of the external environment;
- definition and development of tools for assessing new types of strategic orientations of the company;
- determination of the most favourable combinations of already 'classical' types of strategic orientations with new types depending on the context.

A detailed study of new types of strategic orientations of the company will allow companies to demonstrate increased strategic flexibility in the conditions of the modern dynamically developing context of the business environment and challenges.

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Strategic choice of implementing IT function in multidisciplinary companies

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Abstract
The article is devoted to the analysis and characteristics of possible factors influencing the choice of an IT function implementation model in multidisciplinary companies (MNCs). Today, there are a number of IT function management models for managers of multidisciplinary organizations, but the conditions of choice (factors), as well as practical ways to implement IT function management, depending on the chosen model, have not been widely discussed in the scientific community.
The purpose of the article is a comprehensive analysis of existing models and ways of managing IT functions in multidisciplinary companies, as well as factors influencing their choice in multidisciplinary companies.
A behavioral analysis of the literature sources on the research topic was carried out, as a result of which the main models of IT function management in multidisciplinary companies were characterized, the factors influencing the choice of a certain model of interaction between the MNC business and the IT function were identified, and practical ways of managing IT functions were presented. From a practical point of view, the business community is presented with a description of possible forks in the selection and management models of IT functions, as well as the conditions for their selection. From a scientific point of view, it contributes to the enrichment of research on the management of affiliated IT companies. To date, a comprehensive classification of effective management models for subsidiary IT companies has not been formed, and there is no assessment of the impact on the effectiveness of a multidisciplinary company, depending on the strategic choice of managing the company's IT functions. The scientific community has not presented practical ways to implement a centralized or decentralized model for managing IT functions.
Keywords: management model, business management, information technology, IT, holding company, subsidiary, strategy

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多元化公司实施信息技术功能的战略选择

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简介
这篇文章专门分析了影响多元化公司选择信息技术功能实施模式的可能因素及其特点。如今，多元化组织的管理者有许多信息技术功能管理模式，但选择的条件（因素）以及根据所选模式实施信息技术功能管理的实际方法在科学环境中并未得到广泛讨论。本文旨在全面分析多元化公司现有的信息技术职能管理模式和方法，以及影响其选择的因素。文章分析了与研究课题相关的文献资料，在此基础上总结了多元化公司 IT 职能管理的主要模式，确定了影响业务与 IT 职能互动模式选择的因素，并介绍了 IT 职能管理的实用方法。迄今为止，还没有对信息技术子公司的有效管理模式进行全面分类，也没有评估公司信息技术职能管理的战略选择对多元化公司效率的影响。在研究环境中，也没有提出实施集中或分散 IT 职能管理模式的实用方法。本文对信息技术附属管理的研究做出了贡献，其对企业界的实际意义在于对信息技术职能管理模式、可能的选择和条件的描述。
关键词：管理模式、企业管理、信息技术、控股公司、子公司、战略

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Introduction

Over the past twenty years, a method of managing IT functions in companies based on allocating IT functions to a subsidiary organisation has gradually been developed in Russia. In 2020-2023, it was chosen by a number of large Russian companies, according to the ComNews VISION study 'Captive IT Companies in the Russian Information Technology Market'[1], During this period, 99 new IT subsidiaries were formed, which is comparable to the total number of newly founded subsidiary IT companies from 2010 to 2019.

Despite the fact that the problem of strategic choice in the allocation of subsidiaries in academic research has already been addressed in a number of studies, it has become particularly relevant in relation to IT industries relatively recently. However, studies confirming the effectiveness and feasibility of this management model have been practically non-existent.

The growth and development of subsidiary IT companies (outsourcing) is a trend in the IT market. Their share in the overall IT market is becoming more significant. Thus, by the end of 2024, there will be about 270 subsidiary IT companies affiliated with 101 holding companies from various industries. A year ago, there were only 250, but their revenue exceeded 1,027 billion roubles with a market size of $ 2.9 billion (35% of the market).

The relevance of the article is based on a study of a problem that is currently on the agenda of many large Russian enterprises. It has been little studied by the scientific community [Kedrov, 2024]. Today, there are no studies on the influence of IT function management factors on the choice of an IT model within a multidisciplinary organisation or on practical ways to implement this model. The development of this gap is a pressing task for researchers, and is useful both for its practical application in the business community, due to the sharply increased number of IT subsidiaries in Russian businesses in recent years, as well as from a scientific perspective, since it opens up a discussion on the interaction between multidisciplinary organizations and their IT subsidiaries. In addition, this work structures current approaches to defining IT function management models and factors influencing the choice of an IT function model.

This study is based on a study of a number of IT function management models in a multidisciplinary company, presented by researchers. The analysis and structuring of factors are the root causes for the company's choice of one management model or another. The result of this work is the author's classification of practical methods for implementing IT management in various models of MNCs.

The first part of the work discusses theoretical issues related to defining a multi-profile company and IT functions, and describes models for managing subsidiaries depending on the organisational structure of MNCs. The second part identifies a number of factors that influence the choice between a more centralised and decentralised model for managing IT functions. Finally, the paper presents the author's classification of practical implementations of the IT function management model based on the influencing factors, as well as the model itself.

1. Models of IT function management

The issue of choosing an optimal model for managing IT functions in a multi-industry company plays a key role in its development and gaining a competitive advantage.

Multidisciplinary companies include a number of large multi-industry organisations that are represented in different markets and have a common goal and management. Most often, the group of companies included in a multidisciplinary company is understood as a set of legally independent but to some extent dependent on each other business entities with a single control system [Tsovma, 2018].

The functions of IT in multi-industry companies include a set of organisational and technical processes that are performed in parallel with the main business processes, bringing value to clients. The quality of the services or goods provided by the MNC to its clients depends on the speed and stability of these IT functions.

Multidisciplinary companies operate in different industries and markets, which creates the need for subsidiaries to adapt to the competitive environment of specific markets. They also need to be able to combine information flows and data between all divisions and subsidiaries. Managing IT functions in multinational companies (MNCs) involves storing, processing, and using disparate data between divisions.

In this article, IT function management refers to the choice of an organisational form for a multi-industry company that allows it to best manage the flow of IT processes. The way in which the organisational form of IT management is implemented largely depends on the policies and management style of the multi-industrial company, the goals set by management, and the environment and culture within which the MNC operates.

The researchers presented a number of classifications of models for managing IT functions in a subsidiary organisation, as reflected in Table 1.

Based on the frequency of references in scientific papers, the most common classification is the model of IT function management using three different management

[1] https://www.comnews.ru/content/234875/2024-09-10/2024-w37/1180/keptivnye-it-kompanii-rynke-informacionnykh-tekhnologiy-rossii-2024?ysclid=mbs7r5bk5t251792360.

directions: centralised IT management, decentralised IT management, and a federal model [Ein-Dor, Segev, 1982]. In foreign studies, there is active discussion about these three methods of IT function management with a gradual transition from one dominant model to another.

In recent decades, subsidiary autonomy has become a focus of research on multinational and transnational corporations. Scholars generally identify the late 1970s as the starting point for the stream of literature on subsidiary management.

It was later found that neither centralisation, decentralisation, nor federal forms of Information Technology Governance (ITG) have a significant impact on IT synergies and firm performance. Centralised governance provides greater control over IT standards and provides more opportunities to benefit from economies of scale, while decentralised governance allows tailoring solutions for each business unit.

The strategic focus of a firm with a centralised structure is to minimise costs by maximising process efficiency. A centralised model provides maximum control and economies of scale, but it may not be flexible enough to respond quickly to change.

A firm with a decentralised structure focuses on increasing flexibility in order to respond as quickly as possible to the needs of local consumers. The decentralised model provides a high degree of autonomy for business units, but it is fraught with duplication of functions and loss of control over costs.

The federal model, being a compromise solution, combines the advantages of both approaches, but requires a high level of organisational maturity and developed coordination mechanisms.

The role of a multi-profile company in shaping a model for IT function management is crucial, as it is the corporate strategy, organisational culture and value system of the parent company that sets the framework for possible management decisions. It is important to take into account not only internal factors but also the external environment, including competitive pressures, technological trends, and regulatory requirements. Choosing the optimal management model requires a comprehensive analysis of all these factors and taking into account the specific characteristics of each business.

2. Factors in choosing IT management functions

In general, the prerequisites for choosing a specific model for managing the IT function can be presented as the following groups of factors:

- factors at the country level: economic, political, social, regulatory.

Table 1
Classifications of IT function management models according to different authors

Публикация	Description of the composition and classification of IT function management models
[Ein-Dor, Segev, 1978; 1982]	IT governance can be divided into three different types, depending on the location of decision-making: centralised, decentralised, and hybrid (federal)
[Agarwal, Sambamurthy, 2002]	Partner model: IT department is an active partner in business innovation Platform model: focus on providing IT resources for innovation Scalable model: provides flexibility by using sources for innovation outside the firm
[Adams et al., 2007]	Three types of IT management: centralized, decentralised, and hybrid. Interviews provided evidence that supports the trend towards greater centralisation of IT management
[Van Grembergen et al., 2007]	There are four models of managing IT subsidiaries: federal, anarchic, IT monarchy and business monarchy
[Kiryushkin et al., 2010]	Four models of IT function management are distinguished in the form of a graph with two axes: the level of centralisation of functions and the provision of IT with rules and policies: 1) IT shared service center 2) centralised IT management 3) decentralised IT management 4) federated IT management

Source: compiled by the author.

- industry (market) factors - market dynamism, the level of competition in the industry and requirements for innovation.
- factors at the level of a multi-industry company - technological, organisational culture (methods of creating subsidiaries, ownership strategy, degree of autonomy of divisions and business units of companies, culture).

This is not a complete list of factors that influence the choice of direction for the IT function management model. The direction towards autonomy of the company leads to decentralisation and increased likelihood of forming subsidiaries with a low level of independence. On the contrary, the controlling direction leads to centralisation and a decrease in possibility of separating IT from the organisation, forming a more closed and monolithic structure.

Each of the factors proposed for analysis has a different impact on the choice of the IT function management model. The cross-combination of these factors is still to be studied, but it remains to be seen what their impact will be.

Country-level factors reflect the macroeconomic situation and the social status of multinational corporations. The level of economic development in the country, complexity and security of economic relations, their volume and consistency create a certain bias towards centralisation or autonomy (state of GDP per capita, presence of sanctions or external political restrictions, digital literacy of population, severity of regulatory restrictions) [Kirca et al., 2011].

In highly regulated countries, multisector companies invest more in data security, privacy, auditing and compliance. For example, in the financial sector where there are many regulatory requirements, companies may implement more stringent security protocols, use encryption and conduct regular audits. Additional financial costs for compliance with regulatory requirements slow down development processes and create a more conservative environment, which facilitates compliance with all necessary regulations from the state. Thus, in countries with stricter regulation, centralisation of IT functions within the company ensures proper control over compliance with legislative requirements, while there is a decrease in flexibility in business processes [Jentsch et al., 2017].

In countries with less strict government regulations, MNCs are more flexible and can use cloud technologies and outsourcing to reduce costs. However, they still need to take into account basic requirements such as protecting user data. Multinational companies focus on innovation and the speed of bringing products to market without spending a lot of resources on complying with multiple regulatory requirements. One of the most common and successful strategies in the competitive struggle is decentralised IT management structures that allow for immediate responses to changes in market conditions [Chen et al., 2019].

Among the factors influencing the degree of centralization or decentralisation of the management of IT in a company, one can also highlight the state of MNC itself, which forms information policy and determines the organisational structure of a company.

The scientific literature notes the influence of two factors on the formation of different models of IT function management in multidisciplinary companies: the stage of MNC's life cycle and organisational culture of MNCs.

The stages of a company's life cycle, related to the market and the economy of a country, influence its choice of centralising or decentralising its organisational culture. During the transition from one phase of the life cycle to another, strategic goals change, which affects the type of management structure, as implementing a strategy requires appropriate personnel. Therefore, when a company's strategy changes, its organisational structure must also change.

The influence of the life cycle of an organisation on the degree of control over internal corporate processes has been noted by many researchers. For example, the work [Gurianova et al., 2014] describes a higher degree of centralisation of processes at earlier stages in the life cycle of an organisation. Centralisation at the early stages of a company's formation and growth allows it to organise its growing business and establish a foothold in the market. This process requires control and stability, but there is no single organisational structure that can be applied throughout the entire lifespan of a company.

At later stages of maturity and saturation, there is a tendency towards greater decentralisation of processes associated with business expansion and diversification. In such an environment, great importance is attached to the management of new products, markets, and technologies, as well as to the qualification skills of administrative personnel.

The authors of [Meagher, Wang, 2009] agree that the optimal organisational structure depends on the stage of industry life cycle. Management models can be correlated with stages of life cycle. Thus, in the initial stage decentralisation is prevalent since quick actions are important in realising 'low hanging fruit'. In the intermediate stage, joint exchange of knowledge between parents and subsidiaries facilitated by centralisation proves optimal, as it becomes increasingly difficult to find profitable innovations. Finally, at the decline and bureaucratisation stages, decentralisation once again becomes dominant, as complete adaptation to existing conditions becomes necessary to extract the remaining profit.

Each company goes through life cycle stages in its own way, using different methods to deal with external

environments, which determine different management decisions regarding product lines and competitive policies. For example, [Martins et al., 2020] found, based on an analysis of 280 questionnaires from MNC managers in Brazil that sudden changes to the environment lead to changes in market orientation and create ambiguity in possible strategic decisions for company management.

Another factor influencing the choice of an IT management model in multinational corporations (MNCs) is the organisational culture of the company. The organisational culture, as a set of assumptions, values, and norms shared by members of an organisation, largely determines their opinions and behaviours. Organisational culture imposes on its members the meaning of things and events inside and outside the organisation, thereby directing them to understand the world around them and act in it in a certain way. Thus, organisational culture is an important element of the context in which processes are carried out within the organisation. This also applies to the principles of managing IT functions in the company.

Organisations with a dominant autocratic leadership style are, by definition, highly centralised both horizontally and vertically. In contrast, organisations with a democratic style have varying degrees of decentralisation, depending on the size and structure of their decision-making groups. Laissez-faire organisations are highly decentralised both vertically and horizontally [Čudanov et al., 2009].

In a later study [Janicijevic, Milovanović, 2015] the opposite effect is also observed. The opposite effect occurs or the influence of IT technologies on management in an organisation occurs depending on their area. 'The introduction of IT into people management leads to a high degree of decentralisation. The development of IT for cultural tasks leads to moderate decentralisation; the introduction of IT in cultural powers leads to moderate centralisation; and the development of IT as a cultural center leads to a high degree of culturalisation.' Thus, the implementation of IT technologies and management styles are interconnected. The implementation accelerates and simplifies internal processes related to documentation and control, allowing management to strengthen its position by centralising management, or, conversely, increasing decentralisation.

In general, it can be said that the organisational culture largely determines further management actions towards centralising or decentralising the management of IT functions. The introduction and development of IT technologies in a company's division, depending on its current culture, can lead to both centralised management and greater decentralisation.

In this regard, the authors of the article [Adams et al., 2007] note an emerging trend in the management of American companies in 2007. Evidence has been presented confirming the trend towards ever greater centralisation of IT management. Most companies in the sample have demonstrated centralised IT management, both in initiating and approving decisions regarding the management of IT functions. Only in the area of decision-making regarding the improvement/change of business processes do business units have approximately equal rights with the centralised corporate IT organisation.

The formed opinion of management may be one of the unaccounted factors influencing decision-making in IT functions management.

One of the main reasons for choosing an organisational structure is compliance with market conditions in the industry in which the company operates [Kang et al., 2016]. Traditionally, organisational structures can be classified as centralised or decentralised. A firm with a centralised structure has a strategic focus on minimising costs by maximising process efficiency. In contrast, a firm with decentralised structure focuses on flexibility to respond quickly to the needs of customers.

In a stable market, where demands are relatively predictable, firms may prefer a centralised structure due to the ease of management control. In a centralised structure, a few managers control all decision-making processes.

As the market becomes more volatile, firms are tending to favor a decentralised structure in order to provide greater organizational flexibility in order to effectively meet market needs.

This thesis is supported by an extensive study of 23,337 foreign subsidiaries conducted by the authors [Geleilate et al., 2019]. In a market with less predictable fluctuations, autonomy contributes more to improving firm performance in conditions of high industry dynamism ($r = 0.215$, $p < 0.05$) compared to lower industry dynamism ($r = 0.023$, $p > 0.05$).

3. The influence of management factors on the choice of the method for implementing the IT function

Under the influence of the factors described in the previous section of the article, a certain management and organisational model is formed in a multi-industry company. This model builds the interaction between business and IT functions into a single working mechanism.

Several methods of managing IT functions can be distinguished, depending on the chosen model: centralised management (insourcing, shared service center), decentralised management (subsidiary organisation, outsourcing).

The author's classification of organisational models for IT function management, presented in Table 2, postulates a binary division of factors' influence and

Table 2
Classification of practical ways to manage the OT function based on the chosen MNC model

Direction of influencing factors	MNC management model	Method of practical implementation of IT functions management in MNCs
Country factors: strong government regulation. MNC factors: company founding, growth and autocratic leadership within MNC. Industry factors: a stable and predictable industry.	Centralised management of IT functions	Insourcing - internal distributed IT departments
		Shared service center/competence center (at the level of the MNC head office)
Country factors: weak government regulation. MNC (multinational corporation) factors: life cycle stages (maturity and saturation), democratic management style within MNCs. Industry factors include an unstable market situation and a high level of competition.	Decentralised management of IT functions	Subsidiary IT organisation (captive company)
		Outsourcing of IT functions

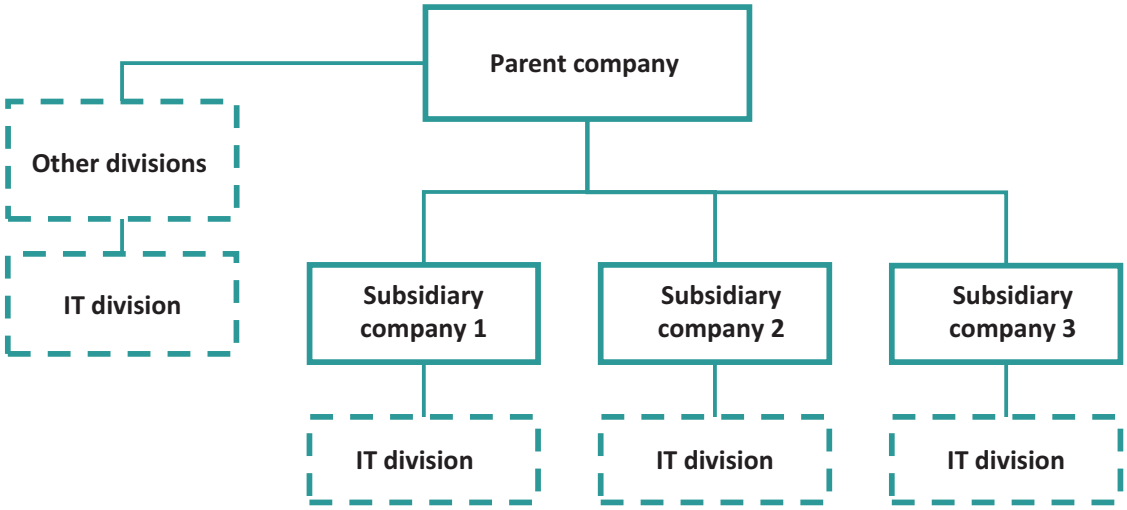
Source: compiled by the author.

is based on a study of several works on this subject. However, these factors do influence each other and lead to changes in influence. The aim of Table 2 is to present a logical approach to analysing and generalising the factors that influence the choice of an IT function management model for MNCs (multinational corporations). The classification presented allows us to make assumptions about the relationship between elements of the table with high certainty, although it requires revision and further expansion, including a study into the cross-influences of factors, their compositions, and details of influence.

If we talk about classification itself, the preservation of IT functions within an organisation under a centralised model does not involve creating a separate legal entity to implement these functions; instead, their implementation remains within either a multi-profile company or each subsidiary organisation, with separate IT departments within each one.

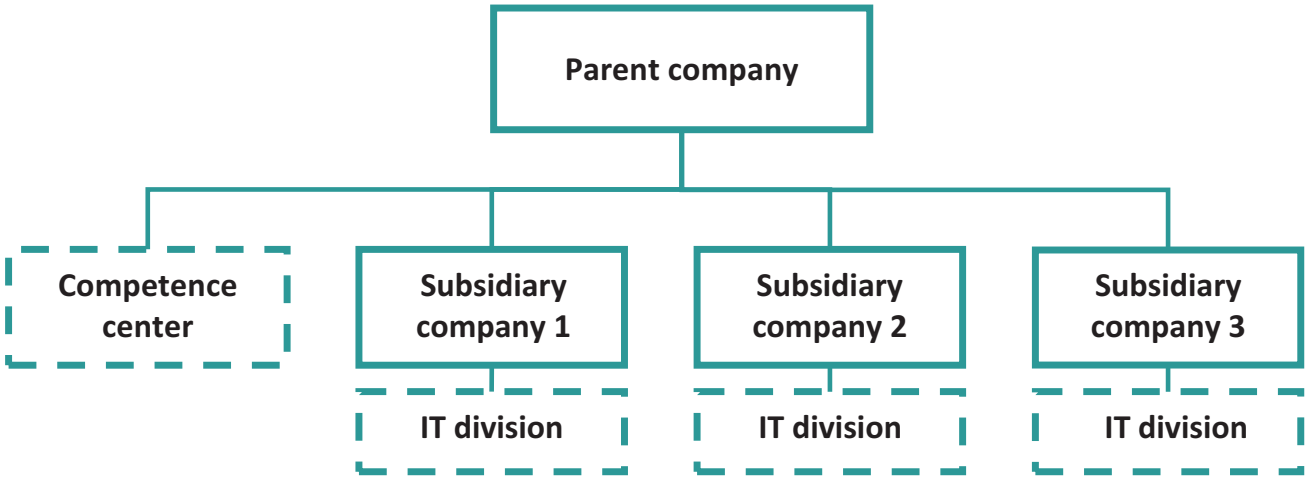
By maintaining distributed IT departments within each individual subsidiary, organisations use virtually individual levels of technology support. However, this can lead to inefficient use of resources and the redundancy of IT processes [Boetoro, Welly, 2022].

Fig. 1. IT function management model within MNCs



Source: compiled by the author.

Fig. 2. IT function management through the creation of a competence center



Source: compiled by the author.

Insourcing can be used for two reasons.

- temporary excess of resources (free capacity, low staff utilisation, etc.)
- competitive advantage in the market (efficient processes, unique resources, databases, and technologies).

The IT functions and operating model are distributed between parent and subsidiary companies. Each company maintains its own IT department, which consists of IT assets, including personnel (talents), applications, platforms, and infrastructure. However, these departments have different scales, leading to redundancy in production capacities and IT resources, as well as suboptimal use of resources within the group.

When forming IT functions within a single competence center, the IT assets of a multidisciplinary organisation are combined into one organisational structure at the MNC level for centralised servicing of the needs of all subsidiaries. In such an organisational form, the IT functions of subsidiaries remain to support basic system functionality and infrastructure maintenance, while R&D, system refinement, integration of new functionality, and internal custom development are all transferred for execution to the competence center without the formation of a separate legal entity[2].

The most general functionality of the competence center:

- development of training programs on IT technologies for employees of subsidiaries.
- accumulation, processing and storage of useful data and experience in a single knowledge base.
- creation and updating of material and technical bases for a multi-industry company.
- formation of project-team skills among employees in subsidiaries.
- support and development of corporate information systems.
- ensuring compliance with corporate standards and the quality of business processes.
- streamlining, centralising and optimising information flows.

The separation of IT functions from a multidisciplinary organization within the framework of a decentralised model creates two different management models: transferring IT functions to an external partner through outsourcing, or creating a subsidiary company that performs IT functions.

There are two scenarios for justified use of IT outsourcing: for companies at the growth stage and for companies in a stable competitive market [Tushavin, 2014]. Insourcing is often a transitional stage on the way to outsourcing, while large companies will gradually transfer more IT functions to outsourcing as the market develops [Stapran, 2017]. The main purpose of using outsourcing companies' services is to reduce transaction costs and focus on core business processes.

Today, the revenue leaders among IT companies that use in-sourcing are subsidiaries of the largest Russian holdings, including vertically integrated oil companies like Lukoil, Rosneft, Gazprom, and Gazprom Neft. Russian Railways and Sber are also among the top 20 by revenue. The list also includes structures of metallurgical and electricity holdings [Stapran, 2017].

Diversified companies use the subsidiary formation strategy for a number of reasons:

- narrowing the possibilities of business development in the current market;

[2] https://habr.com/ru/companies/T1Holding/articles/707852/.

- strengthening the company's competitive position;
- entering related industries;
- reducing the costs of duplicating functions [Kobiashvili et al., 2015];
- reduction of agency costs
- reduction of risks for the company and investors
- obtaining tax benefits [Oliveira et al., 2023].

Regardless of the reasons, a decision is made only if it benefits the shareholders.

Creating a subsidiary reduces the size of a parent company, while allowing it to focus on a single type of activity that benefits both the company and the shareholders.

The positive aspects of creating a separate division for a parent company can be formulated as follows:

- focusing on your area of activity;
- increasing the number of products/services offered;
- developing new markets by creating an additional division;
- strengthening your advantage in negotiations with suppliers;
- preserving your jobs by transferring some employees to other positions;
- attracting more specialised human resources with greater expertise.

The decision to create a subsidiary is made by shareholders in order to increase their own capital and obtain benefits. It can be implemented for various reasons. In Russia, the most common practice of creating subsidiaries is in the financial, oil and gas, and telecommunications sectors.

Conclusion

The paper presents a comprehensive study of the strategic choice of implementing IT functions in multidisciplinary companies. It identifies a number of models for managing these functions, as well as internal and external factors that influence their selection. The author proposes a vision of how these factors influence the choice of specific models, and one such model is described. The paper also analyses the state of the Russian IT industry for 2024 and identifies trends in the growth of subsidiary IT companies within multinational corporations.

Based on the conducted analysis, it can be concluded that the management of IT functions in multidisciplinary companies can be implemented using various models, including centralised and decentralised options. In this work, we analysed both directions for implementing IT management (decentralisation and centralisation) under the influence of specific factors, which makes this study different from others. It is essential to have a comprehensive understanding of possible strategic approaches to implementing IT functions, as well as to consider the factors influencing the choice between centralising or decentralising the management of these functions in multinational companies.

Prospects for further research include studying a wider range of factors influencing the choice of IT function management implementation within or outside MNCs, as well as a broader range of IT management models in MNCs. At the same time, the issue of cross-influences between the factors and the identification of their relative strength remains open, based on empirically substantiated data.

The study of strategic options for managing IT functions in multidisciplinary companies is important for the business community from a practical perspective, as it provides a description of potential choices and models for managing these functions. It is also valuable to the scientific community because it allows for a more comprehensive examination of the topic.

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Structural model for creating a human-centered banking strategy in a digital environment

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Abstract

In the context of banking digitalisation and increasing customer experience requirements, the concept of human-centricity becomes particularly relevant. This paper proposes a structural model of a human-centered marketing strategy in banking, focusing not only on clients but also on employees, partners, and society. The aim of the study is to develop a comprehensive approach to implementing human-centricity as the foundation for sustainable bank development in a digital environment. The methodology includes customer and internal data analysis, emotional analysis, and the B2H2H and B4H frameworks. The research identifies four key levels of the model: corporate culture, extended human experience, social responsibility, and ethical digitalisation. The paper presents metrics for SDNA, BTI, EPI, and CPI indices, enabling practical assessment of strategy effectiveness. The practical significance lies in the adaptability of the model to specific organizational contexts and the development of flexible tools for managing emotions and engagement. The originality of the approach lies in integrating emotional intelligence, digital tools, and co-creation by both clients and employees. The article is relevant for researchers in marketing, digital transformation, and human resource management in the financial sector.

Keywords: human-centricity, bank, strategic marketing, engagement, digitalization, customer experience, SDNA, B4H

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数字化环境中形成银行以人为本战略的结构模型

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简介

在银行业数字化和客户体验要求不断提高的背景下，"以人为本 "的概念显得尤为重要。本文致力于在银行中建立以人为本的营销战略结构模型，不仅关注客户，还关注员工、合作伙伴和社会。研究的目的是制定一种全面的方法，将以人为本作为银行在数字环境中实现可持续发展的基础。方法框架包括客户和内部数据分析、情感分析和 B4H 概念。研究确定了模型的四个关键层次：企业文化、增强客户体验、社会责任和以人为本的数字化。报告介绍了 SDNA、BTI、EPI 和 CPI 指数的计算方法，这些指数可对战略实施的有效性进行评估。其实际意义在于，可以根据特定组织的具体情况调整所提出的模型，并开发灵活的工具来管理情感和参与度。该方法的独创性体现在将情商、数字化解决方案以及客户和员工共同创造价值融为一体。这篇文章对金融行业的营销、数字化转型和人力资源管理研究人员很有意义。

关键词： 以人为本、银行、战略营销、参与、数字化、客户体验、SDNA、B4H

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There is a contradiction in modern banking practice. The terms ‘customer focus’ and ‘human-centricity’ are actively used in corporate documents and marketing materials. However, their content often remains unclear to both employees and customers of financial institutions, creating significant barriers to the full implementation of these concepts in banks’ daily work.

The traditional customer-centric approach, which has become an industry standard, focuses primarily on meeting customer needs at the point of interaction. This is

expressed in the creation of convenient digital services, the optimisation of service processes and the personalisation of offers [Todupunuri, 2025]. However, this approach has some limitations, as it sees the customer more as an object of influence rather than a full participant in creating banking services.

The human-centric model provides a deeper and more comprehensive view of the bank's interactions with all stakeholders. Its key characteristics include:

- taking into account the interests of all participants in the banking ecosystem - not only clients, but also employees, shareholders, regulators and society as a whole;
- focusing on building long-term relationships that go beyond individual transactions;
- integrating ethical principles and values into business processes;
- creating conditions for meaningful dialogue between the bank and its stakeholders.

In practice, many financial organisations that claim to be transitioning to human-centeredness limit themselves to superficial changes. These may include the formal introduction of new positions, one-time training sessions, or local initiatives to improve the corporate culture, but these are not systemic transformations.

The model places particular emphasis on transforming organisational culture, as without profound changes in the values and behaviour of employees, any technological or process innovations will remain incomplete.

An important advantage of the model is its flexibility and adaptability to various conditions. It provides different implementation options, taking into account the specifics of each credit institution, the characteristics of its client base, and the stage of development.

Historically, the first model of business interaction with customers was B2C (Business to Consumer), in which companies directly offer goods and services to end consumers. Later, due to the complexity of economic processes and the development of cooperation between enterprises, the B2B (Business to Business) model emerged, focusing on interaction between organisations. However, despite its formal focus on businesses, B2B also involves relationships between people, as corporate decisions are made by specific employees who interact with each other behind the scenes.

The realisation that any commercial activity ultimately comes down to the human factor leads to the emergence of the B2H2H model (Business to Human (employees) to Human (clients)) [Kotler, 2021]. The development of this concept logically led to B4H (Business for Humans) - a model in which business does not simply sell goods and services, but acts in the interests of people, creating value and long-term relationships in which services are provided to people by the same people.

The B4H model is based on four levels of interaction that form a holistic ecosystem of human-centeredness:

- H1 (Human-Centric Culture) - human-centric corporate culture. This is a transition from KPI-oriented management to a model of employee support and development; the introduction of 'organisational empathic intelligence' that takes into account the emotional state of personnel. Emphasis on the well-being of employees, involvement and long-term development;
- H2 (Human Experience Beyond Client Needs) - human experience beyond client needs. The bank not only satisfies current requests, but also anticipates future needs of clients and employees, creating financial solutions that take into account life scenarios and the context of each person. Proactive support for clients in difficult situations (financial crises, life changes, career changes);
- H3 (Human Ecosystem & Social Responsibility) - social responsibility and the impact of the ecosystem leading to the creation of an interactive platform where the bank becomes a support center, not just a financial institution. Programs for financial education and social adaptation for vulnerable groups are being developed; inclusive banking products are being created for different segments of the population;
- H4 (Human-Driven AI & Ethical Digitalisation) - human-centric artificial intelligence and digitalisation are not technologies that replace people in the workplace. Instead, they act as tools to facilitate and speed up operational processes, allowing people to focus on more important tasks. They provide the opportunity for people to more efficiently and deeply engage with customer problems and to find effective solutions, while AI handles routine work [Lignell, 2023]. The use of hybrid services provides a balance between automation and live communication, based on customer preferences.

The comprehensive model of the human-centric marketing management strategy of B4H Bank consists of three levels. Each level is responsible for creating the necessary elements that characterise the strategy.

The first level is the formation of 'social DNA of the bank', which is the foundation and adaptation of values. Its goal is to create a unified system of values that unites clients and employees. To achieve this, it is necessary to:

– model the bank's values: analyse the corporate culture, values of clients and employees;
– determine the emotional triggers of employees and clients. AI analysis of communications, surveys, HR analytics can be used as tools;
– organise a trust platform, which is a dynamic system for measuring the involvement of clients and employees.

Table 1
Example of value categories

Category	Examples of values
Emotional	Trust, empathy, respect
Behavioural	Transparency, engagement, feedback
Social	Inclusion, accessibility, responsibility

Source: compiled by the author.

The result will be a visualised value map. Emotional triggers that influence employee satisfaction and motivation will be identified, and an emotional engagement management strategy will be developed based on these triggers. This will allow us to move on to the next step of personalising the customer experience.

1. The result can be measured using metrics:

Social DNA Index (SDNA Index) - the degree to which a bank's products and communications correspond to its values and customer expectations, calculated using the formula

$$SDNA = \frac{\sum K_c}{N} \times 100\%, \quad (1)$$

where $SDNA$ – the integral index of values conformity (Social DNA Index), K_c – the number of coincidences of values (from the word 'coincidence') between the bank, employees and clients, N – the total number of verified values. A successful result is expected at a rate of 70%+.

To calculate you need:

1) to form a matrix of basic values – a categorical scale, which will become the basis for the survey, text analysis, and comparisons (Table 1);

2) to collect primary data using the following methodologies:

– for external clients:
  – questionnaires (scaling of importance/assessment of values, open-ended questions);
  – interviews (10-20 people, semi-structured);
  – an analysis of reviews on the internet (social networks, forums, app store/google play).
– for internal clients:
  – a survey on the perception of internal values and environment;
  – an analysis of internal communication;
  – interviews with employees at different levels (HR, front-line, IT, strategic).

3) to collect secondary data on bank operations and reputation. Sources of information:

– ESG reports, press releases, CSR and brand pages;
– employee engagement statistics (eNPS, turnover, feedback);
– brand mention tone - tone analysis in social networks;
– loyalty and trust indices (if any) CSAT, NPS, Brand Trust Index.

4) to standardise and encode data:

– translate open-ended responses into coded values (qualitative content analysis → frequency of words, categories);
– assign values to each indicator (0 – no match, 1 – partial, 2 – full compliance) (Table 2);
– align scales to a single dimension (for example, recalculation into fractions/percentages).

Next, you need to make calculations according to formula (1). The results can be displayed as a Spider chart or Heat map of the values' correspondence.

2. Brand Trust Index (BTI) - how customers perceive a bank, measured by the formula (2):

$$BTI = \frac{\text{Positive mentions} - \text{Negative mentions}}{\text{Total mentions}} \times 100. \quad (2)$$

To calculate this indicator, it is necessary to collect and analyze public mentions of the brand for a given period. For example, for 3-6 months, social networks, mass media, media mentions, reviews, and comments in bank applications can be used as sources. An example of interpreting the results can be seen in Table 3.

Table 3
Interpretation of the final index

BTI value	Interpretation
0–39	Critical level of mistrust
40–59	Low level of trust
60–74	Average, unstable level of trust
75–89	High level of trust
90–100	Exceptionally high level of trust and reputation

Source: compiled by the author.

Table 2
Data correspondence matrix

Value	Claimed by the bank	Expected by the client	Actually being implemented	Compliance
Transparency	+	+	+	2
Innovations	+	–	+	1
Empathy	–	+	–	0

Source: compiled by the author.

The second level is 'meta-emotion' as a way to manage customers and work experience. The goal of this level is to create an adaptive system that manages emotions of customers and employees. To do this, you need to:

1) conduct emotional analysis of customers and employees in real-time using NLP analysis of messages, speech tone, and behavioral data.

2) make tailored changes to marketing, service, and internal processes based on emotions.

3) calculate automated employee workload distribution - AI analyses stress levels and redistributes tasks.

At this stage, the bank adjusts customer and internal processes in real time based on the emotional state of customers and employees. This leads to the following relationships: engaged employees → improved quality of customer service; optimized workloads → reduced burnout and errors.

Emotional and behavioral data are then used for collaborative product design and internal process optimiьiation.

At this stage, the bank carries out prompt adaptation of both client and internal processes, focusing on the current emotional states of both clients and employees. Such dynamic adjustment of interaction allows for the formation of stable relationships: increased staff involvement contributes to the improvement of the quality of client service, while effective distribution of the workload reduces the risk of professional burnout and the likelihood of errors in operational activities. Second-level performance metric:

The Emotional Perception Index (EPI) measures how positive emotions a bank evokes in customers. That is, it measures how much customers feel positive, trusting, pleased, calm, and involved in their interactions with the bank. This is measured using the following formula (3):

$$EPI = \frac{E_+ - E_-}{E_{total}} \times 100, \quad (3)$$

where E_+ – number of positive emotional responses, E_- – number of negative emotional responses, E_{total} – total number of emotional expressions (including neutral ones).

The calculation is based on three sources: texts, reviews, and social media. First, we need to analyse emotions in texts and comments using emotion detection. Emotions are divided into positive (joy, trust, gratitude, relief), negative (anger, fear, disgust, irritation), and neutral categories. Then, we conduct a survey of customers with direct questions about the dominant emotion experienced during interaction with the bank. Questions are rated on a scale from 1 to 5 or by intensity 'never - sometimes - often - always'. The third source is psychophysiological analysis. If a UX laboratory study is conducted (on mobile applications or in a bank branch), eye-tracking, facial recognition, skin conductance, EEG (in advanced UX centers) are used. This component is rarely used, but it can be included in the scoring system as a reliable marker of emotional reaction. The EPI value can be seen in Table 4.

The third level – live focus groups – involves joint product development and improvement of internal processes, its goal is to use emotions and behavioral data to improve products, customer service and the internal environment. This level requires:

1) creating a digital platform for collaborative design where ideas from clients, employees, and artificial intelligence are synchronised.

Table 4
Interpretation of the EPI scale

EPI value (0–100)	Emotional response of the client
0–30	Discomfort, irritation, negative perception
31–50	Predominantly neutral or contradictory perception
51–70	Moderately positive emotions, basic trust
71–90	High emotional comfort and loyalty
91–100	Strong emotional attachment to the brand (WOW effect)

Source: compiled by the author.

Table 5
Interpretation of the CPI scale

CPI (%)	Level of involvement
0–30	Formal participation, almost no reactions
31–60	Partial participation, weak implementation
61–85	Moderate and stable involvement
86–100	Strong integration of clients into the bank's development

Source: compiled by the author.

2) implementing interactive feedback and product testing through analysis of reviews and emotional reactions.
3) AI-generated product improvement recommendations for customers and employees [Obuchettiar, Megargel, 2023];
4) changing the working conditions of employees depending on their emotional state.

Products are created taking into account the real emotions and needs of customers. Employees are more involved in optimisation processes. As a result, flexible working conditions for employees lead to a decrease in burnout and, subsequently, an increase in productivity.

Level 3 Performance Metric:

The Customer Participation Index (CPI) allows for quantitative measurement of the degree of customer participation in the development of bank products and services. It also measures the depth and frequency of interaction between customers and the bank, as a co-creator of value. The index is calculated using a formula that takes into account customer feedback:

$$CPI = \left(\frac{P_{\text{involved}}}{P_{\text{total clients}}} + \frac{I_{\text{implemented}}}{I_{\text{offered}}} \right) \div 2 \times 100\%, \quad (4)$$

where P_{involved} – The number of customers who participated in the creation and improvement of products, $P_{\text{total clients}}$ – total number of active clients, $I_{\text{implemented}}$ – number of ideas implemented, I_{offered} – total number of ideas proposed by clients.

The share of engaged customers can be determined by using CRM (Customer Relationship Management) platform analytics (how many customers participate in surveys, testing, and participation programs), as well as forms (Google Forms, Typeform, 'Suggest an idea') and a platform such as the customer's personal account or mobile app.

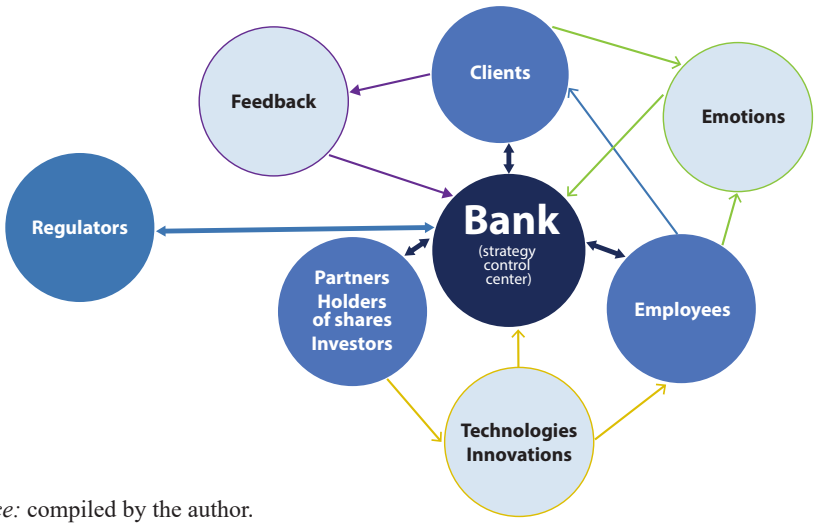
Information on the share of accepted ideas (implemented) can be obtained from internal reports/initiative logs, platforms such as the 'idea bank', crowdsourcing portals, and reports on the implementation of client proposals (for example, from public communications).

The sum of the two indicators, P and I, must be divided by 2 because the CPI formula uses two equally important components. The arithmetic mean of their shares is taken, as an example of interpreting the results, which can be seen in Table 5.

Let's take a closer look at how the state of employees and their attitudes towards them affect the customer experience:

- burnout → slow and poor service → negative customer emotions → customer churn;
- engagement → empathy → improved customer experience → increased satisfaction;

Fig. Schematic visualisation of the model



Source: compiled by the author.

- flexible working conditions → employee motivation → better service → increased trust in the bank.

You can see a direct relationship between employees and the quality of a bank's products. In a human-centric model, interactions are dynamic, involving employees and partners, as their emotions and involvement determine the level of service. This is in contrast to traditional marketing models where interactions are only between banks and clients.

In the human-centric model, the bank is the central node of the ecosystem. It implements strategic management of all key processes. This can be seen in the figure. The employees form customer service, and are actively involved in product development. Customers provide feedback and participate in the joint creation of value. Partners, including financial, technological and social organisations, contribute to the development of innovative solutions, while regulators, represented by the central bank and government institutions, set the regulatory framework for operation. The interaction between the elements of the ecosystem is based on the principles of mutual benefit: employees gain access to corporate values, training programs and modern technologies, ensuring a high level of engagement, service quality and innovation. Clients use personalised products and services while simultaneously providing the bank with data, emotional responses and loyalty. Employees, through high-quality service, create a positive emotional experience for clients, which in turn serves as a basis for further improvement of service. Partners provide resources, investments, and technological solutions and the bank provides access to new markets, integration models. Compliance with regulatory requirements ensures the transparency and sustainability of the entire ecosystem. It is not just a bank but a living ecosystem where each participant influences the quality of service and strategy.

Unlike the traditional model, where banks 'force' products on clients, the human-centric model is based on flexible relationships and mutual beneficial development.

The emotions of employees and customers become not just a fact, but a tool for marketing and business development. As a result, the bank operates on values and involvement as a dynamic and self-developing platform.

To implement the proposed bank's marketing management strategy, the following steps need to be taken:

1. Creating a human-centric banking environment, rethinking the internal culture, and forming a human-centered business model:
   – introduction of emotional leadership - training managers to work with employee motivation and engagement;
   – revision of the performance evaluation system - not only KPIs, but also the Employee Well-being Index.
   – creation of a flexible work environment where employees feel part of a meaningful process.
   – inclusion of clients and employees in the process of joint product design (co-creation)
   – development of the concept of 'financial mentoring', where the bank acts not only as a service, but also as life consultant
   – taking into account not only transaction data, but also context factors (changes in social status, life priorities, personal circumstances).

2. Interacting with customers as people, not as sales objects; moving from managing customer segments to managing life scenarios; demonstrating the flexibility of digital solutions for customer behaviour:
   – instead of standard product lines, individual life models are offered that take into account the client's financial and personal circumstances.
   – focus is on the mental well-being of clients, reducing stress during financial transactions and promoting transparency in decision-making. Aggressive sales are avoided.
   – adaptive interfaces are implemented, allowing the bank to adapt to the user's level of financial literacy. Predictive services are developed to help avoid financial difficulties. Interaction is through a 'financial interlocutor' rather than just chatbots.

3. Social dimension of human-centeredness. Changing the position of the bank in society; making the bank a trusted partner, not just a seller of services.
   – development of sustainable financial behaviour programs: helping clients to develop healthy financial habits.
   – the bank as a support platform, not just a commercial structure (educational initiatives, mentoring).
   – creation of inclusive products, taking into account the needs of people with limited mobility and pensioners.
   – development of ethical marketing and refusal of manipulative sales.
   – increase in the transparency of conditions and reducing cognitive load when making financial decisions.
   – implementation of the 'financial compass' mechanism to help clients find optimal solutions without pressure from the bank.

The B4H model differs from a customer-centric approach in that it not only personalises financial services, but also creates a new paradigm for marketing management based on a deep understanding of the person, their needs, emotions, and life scenarios.

The bank of the future is not just a financial institution, but a social entity that creates long-term value connections between people, technology and society. This model combines analysis of customer and employee emotions to create a living, dynamic ecosystem within the bank. Employees and customers become part of the value-creation process. Emotions are used not only for sales but also for internal optimisation, which allows the bank to gain flexibility and adaptability. Customers get a personalised experience as a result.

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