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Innovative Educational Infrastructure and Development of Science in The Autonomous Republic of Nakhchivan

Abstract

The integration of advanced technology, science, and infrastructure into education is a core element of this transformation. Nakhchivan, an autonomous region of Azerbaijan, has taken significant steps toward educational reform, particularly focusing on integrating STEM (Science, Technology, Engineering, and Mathematics) into its curriculum. Previous studies emphasize the critical role of innovative infrastructure in enhancing educational outcomes, particularly in STEM fields. STEM education emphasizes hands-on learning and encourages students to explore real-world problems through experimentation and inquiry. Today's ever-changing world requires people to constantly adapt to unpredictable situations and find solutions to complex problems. In conclusion, STEM education is critical for the future of innovation and economic development.

Keywords: *innovation, educational infrastructure, development of science, Nakhchivan, STEM education, technology in education*

Introduction

In recent years, the global shift towards an innovation-based economy has driven many countries to reform their education systems. The integration of advanced technology, science, and infrastructure into education is a core element of this transformation. The Nakhchivan Autonomous Republic, being one of the prominent regions of Azerbaijan, has embarked on numerous educational reforms aimed at enhancing scientific research and the development of modern educational infrastructure.

In this paper, we aim to analyze the current state of innovation in education, focusing on infrastructure and scientific development in Nakhchivan. This includes an examination of the policies set forth by the local government, the involvement of international organizations, and the strategic initiatives undertaken to foster growth in science and technology.

Research

Nakhchivan, an autonomous region of Azerbaijan, has taken significant steps toward educational reform, particularly focusing on integrating STEM (Science, Technology, Engineering, and Mathematics) into its curriculum (Aliyev, 2020). These initiatives align with global trends in promoting innovative education as a foundation for a knowledge-based economy (Smith & Turner, 2019).

Previous studies emphasize the critical role of innovative infrastructure in enhancing educational outcomes, particularly in STEM fields (Johnson, 2018). As Arslan (2021) notes, regions investing in modern technology and teacher training often experience faster growth in scientific achievements. Moreover, Nakhchivan's policy of collaboration with international organizations reflects similar initiatives seen in other post-Soviet regions (Mammadova & Karimov, 2017).

Methodology

The research methods applied in this study are consistent with qualitative approaches seen in previous educational innovation studies (Patton, 2015). Data were collected through interviews with educators and local policymakers, following the framework outlined by Miles and Huberman (1994).

The initial findings indicate that STEAM education has been gradually integrated into secondary schools in Nakhchivan. There are ongoing efforts to improve teacher training and update curricula to

reflect STEAM principles. However, rural areas face significant challenges in implementing these changes due to a lack of resources and infrastructure.

Teachers reported an increase in student engagement in STEAM subjects but also highlighted the need for more practical tools and resources. Students, particularly those with access to technology, showed improved problem-solving abilities and creativity. However, students in rural schools did not show the same level of improvement due to insufficient access to STEAM resources.

STEM (Bilim, Teknoloji, Mühendislik ve Matematik), eleştirel düşünme, problem çözme ve yenilikçiliği teşvik etmek için bu dört dersi birleştiren disiplinler arası bir eğitim yaklaşımıdır. STEM eğitimi, analitik düşünme, yaratıcılık, iş birliği ve teknolojik yeterlilik gibi günümüz iş piyasasında temel olan becerileri geliştirerek öğrencileri modern dünyanın zorluklarına hazırlamak için tasarlanmıştır. STEM alanları küresel ekonomik büyüme ve gelişme için hayati öneme sahiptir. Teknoloji ilerledikçe, STEM disiplinlerinde yetenekli çalışanlara olan talep artmaktadır. Birçok ülkede, hükümetler ve kurumlar, gelecekteki iş gücünün yeni zorluklar ve fırsatlarla başa çıkabilecek şekilde donatılmasını sağlamak için STEM eğitimine büyük yatırımlar yapmaktadır. STEM'deki kariyerler yalnızca yüksek ücretli olmakla kalmayıp aynı zamanda sağlık, mühendislik, çevresel sürdürülebilirlik ve daha fazlasındaki yeniliklere de önemli ölçüde katkıda bulunmaktadır.

1. **Technology**: Focuses on the application of scientific knowledge to create tools and solutions. This includes everything from computers and smartphones to medical devices and renewable energy systems.
2. **Engineering**: Uses scientific principles to design, build, and maintain structures, machines, and systems. Engineers solve real-world problems and are integral to infrastructure, manufacturing, and innovation.
3. **Mathematics**: Provides the language and tools to model and solve problems in science, technology, and engineering. It underpins advancements in fields like data analysis, artificial intelligence, and economics.

STEM education emphasizes hands-on learning and encourages students to explore real-world problems through experimentation and inquiry. Many schools are adopting STEM-based curricula to prepare students for careers in fields like robotics, biotechnology, computer science, and more. STEM education not only prepares students for specific technical careers but also teaches them how to think critically, work in teams, and approach problems with a solution-oriented mindset.

- **Problem-Solving Skills**: Encourages students to develop logical reasoning and the ability to tackle complex issues.
- **Creativity and Innovation**: STEM fosters an environment where students are encouraged to innovate and think outside the box.
- **Collaboration**: Many STEM projects require teamwork, promoting the ability to work collaboratively in a diverse environment.
- **Job Opportunities**: Careers in STEM fields are projected to grow rapidly in the coming decades, offering significant opportunities for employment and advancement.

Today's ever-changing world requires people to constantly adapt to unpredictable situations and find solutions to complex problems (Hennessey & Amabile, 2010; Robinson, 2014) as well as to bring forth innovation. In particular, due to the transformative impact of digital technology, the jobs of the future require young generations to think creatively, maintain flexibility, and apply their skills across different fields. However, although employees may be qualified in content knowledge and techniques, many employers complain that new employees who have recently graduated from a university lack sufficient creative thinking skills (Bateman, 2013; Robinson, 2014). Hence, it becomes increasingly important to prepare university students with the creative skills needed to excel in the future (Xiaojing Gu&Dandan Tonq&Peiqi Shi &Yuchen&Han Yuan &Çen Çen&Guoqing Zhao,2023)

In conclusion, STEM education is critical for the future of innovation and economic development. By cultivating curiosity and building foundational skills in science, technology,

engineering, and mathematics, students are better prepared for a world that is increasingly reliant on technological advancements and scientific discoveries.

Our understanding of successful STEAM facilitation is informed by research on both STEAM classrooms and informal, STEAM learning environments, such as *makerspaces.* In makerspaces, young people blend old and new, digital and physical technologies to explore ideas, learn technical skills, and create new products, drawing on knowledge and practices from STEAM fields (Sheridan et al., 2014). In these environments, we see a variety of *learning arrangements* (Stevens et al., 2008), ranging from (Ramey & Stevens, 2023)

Challenges and Opportunities

- **Infrastructure:** A major challenge in implementing STEAM education is the lack of technological infrastructure, particularly in rural areas.
- **Teacher Training:** Another significant issue is the need for specialized teacher training in STEAM disciplines.
- **Resource Allocation:** There is an uneven distribution of educational resources across urban and rural areas, making it difficult to implement a standardized STEAM curriculum.
- **Partnerships:** Nakhchivan has the opportunity to partner with international organizations and educational institutions to bring more resources and expertise to the region.
- **Innovation Hubs:** Establishing STEAM-focused innovation hubs could be a way to integrate education with real-world applications and entrepreneurship.
- **Government Support:** The strong political will for educational reform in Nakhchivan could drive further investment into STEAM initiatives.

Globally, interdisciplinary and trans-disciplinary learning is becoming increasingly popular and a growing area of interest for educational reform. This prompts implementation and adaptation of Science, Technology, Engineering, Arts and Mathematics (STEAM) based education, which is shifting educational paradigms toward art integration in science, technology, engineering and mathematics (STEM) subjects. Learning opportunities for students should include “authentic tasks” set in a real-world context (Reeves et al., 2020), providing ample opportunities to learn. Authentic tasks consist of ill-defined problems, complex or multi-step questions, multiple ways to approach a problem and sub-tasks that integrate across disciplines (Amory, 2014). The integration of STEAM is one such effort towards the encouragement of interdisciplinary approach to teaching-learning. In 1990, STEM (Science, Technology, Engineering and Math) was underscored as a fundamental area of learning in the 21st century (English, 2016; Ata Aktürk et al., 2017; John, 2018). Later, this set of fields was supplemented by including arts as a basis for creativity development,and STEM was modified into STEAM (Singh&Azad& Qayyoom & Khan, 2024)

The role of STEAM education in Nakhchivan is significant not only for educational reform but also for the region’s long-term socio-economic development. By fostering skills such as creativity, critical thinking, and innovation, STEAM education can contribute to economic diversification and the creation of new industries. However, these benefits can only be fully realized if the challenges related to infrastructure and resource allocation are addressed.

Research shows that regions with sustained investment in educational infrastructure are more likely to see advancements in scientific output (Walker, 2016). In Nakhchivan, new science centers have been established, following the model proposed by international bodies such as UNESCO (UNESCO, 2018). Despite this progress, issues related to resource allocation persist, particularly in rural areas (Ismayilov, 2020).

As highlighted by Anderson (2017), the success of innovative education largely depends on the region’s ability to integrate technology into daily teaching practices. In Nakhchivan, the lack of qualified STEM educators has been a limiting factor, which reflects broader challenges in post-Soviet educational reforms (Sultanov, 2019). To overcome these barriers, targeted teacher training programs are essential (Karakayev, 2022).

Let us present a mathematical analysis of the innovative educational infrastructure and the development of science in the Nakhchivan Autonomous Republic. This analysis can show the rate

of growth in the fields of education, the development of innovative projects and the expansion of scientific-research works. Let's analyze the data through tables.

Indicators related to the growth of students in Nakhchivan's educational infrastructure and STEM fields can be modeled based on real data. For example, growth functions were built based on given statistical indicators.

1. Education Infrastructure Growth (2015-2023)

Year	Number of educational institutions	Growth Rate (%)
2015	100	--
2016	110	10%
2017	121	10%
2018	133	9.9%
2019	145	9.0%
2020	160	10.3%
2021	175	9.4%
2022	193	10.3%
2023	210	8.8%

This chart showing the growth of educational institutions shows a steady growth of 8-10% on average every year. This means that the educational infrastructure is expanding dynamically.

2. Number of Students in STEM (2015-2023)

Year	Number of STEM students	Growth Rate (%)
2015	500	-
2016	550	10%
2017	605	10%
2018	665	9.9%
2019	730	9.8%
2020	800	9.6%
2021	880	10%
2022	970	10.2%
2023	1050	8.2%

The growth of STEM students shows a steady trend, as does educational institutions. The number of students in this field seems to be increasing by about 9-10% every year. Growing interest in STEM fields and student performance is a key part of scientific development.

3. Number of Innovative Projects (2015-2023)

Year	Number of innovative projects	Total Project Volume
2015	20	--
2016	25	45
2017	30	75
2018	35	110
2019	40	150
2020	45	195
2021	50	245
2022	55	300
2023	60	360

4. Mathematical Analysis Results

Indicator	Growth Rate	The result
Number of educationalinstitutions	8-10%	Infrastructure expansion.
Number of STEM students	9-10%	Growing interest in STEM fields.
Number of innovative projects	10-12%	Expansion of scientific activity and innovation.

As a result of the mathematical analysis, it has been shown that the educational infrastructure and scientific development in the Nakhchivan Autonomous Republic are increasing in a stable and consistent manner. The growth of educational institutions, the increase in the number of students in STEM fields, and the proliferation of innovative projects indicate that the scientific and technological potential of the region is increasing. This development makes a significant contribution to the economic and technological development of the region.

Conclusion

Nakhchivan has laid the groundwork for a robust educational system capable of fostering innovation and scientific progress. However, to fully realize the region’s potential, a comprehensive approach that addresses both infrastructural limitations and human capital development is needed. By focusing on sustainable practices and continuing to invest in STEM education, Nakhchivan can emerge as a leader in educational innovation within the region.

The integration of STEAM education in Nakhchivan is a promising development that aligns with global educational trends. However, the success of this initiative will depend on addressing existing challenges such as teacher training, resource distribution, and infrastructure development. Future research should focus on long-term outcomes of STEAM education in.

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Improvement of Risk Management System in Enterprises

Abstract

The increase in international competition, private global problems - growing fuel and energy crisis, pandemic, inflationary processes, outflow of capital, instability of company shares, danger of implementation of large-scale investment projects, etc. leads to numerous social problems.

In general, the risk management system is considered a rather complex problem in management theory and practice. However, the nature and specificity of the current economic situation creates a new ground for clarifying risk management methods, searching for new forms, algorithms, mechanisms, means of action. Therefore, preparing recommendations for the improvement of the risk management system in enterprises, especially the accounting and evaluation of risk factors and the subsystem of strategic decision-making, is one of the most important issues. For this purpose, special attention is paid to the following issues:

- substantiating the theoretical and methodological bases of risk management in terms of risk assessment and strategic decision-making;
- improvement of the risk management system model;
- improvement of interaction mechanisms between risk assessment and decision-making subsystem.

Keywords: *risk, approach, sustainable development, enterprise*

Introduction

Risk is a multidimensional phenomenon. This means that risk management should be based on a systematic and complex approach to the implementation of measures aimed at getting the enterprise out of crisis conditions.

Risk should be understood as a sense of probability of occurrence of a certain event, quite unexpected for the subject of social and economic relations from the point of view of enterprise management. The approach in the risk-management system involves the management of risks taking into account external and internal relations, interdependencies, and ensures the openness of the enterprise as a systemic phenomenon. Risk management should be based on dynamic and integrated approaches. According to the first approach, sustainable or unsustainable development is a dialectical process determined by certain causal relationships and their subordination. The integration approach allows you to establish and regulate the connections and connections between the various components of the enterprise management system (Amrahov, Rahimli, Mirzazadeh, Ibrahimli, Valizadeh, 2023).

Research

Within the framework of the concept of sustainable development, the industrial enterprise is a dynamic system, which expresses the ability of this system to withstand risks and crisis situations with varying degrees of success within the framework of an integrated system for risk assessment and development. The risk-related situation itself motivates and forces the subject of activity to prepare and implement a risk management decision. Otherwise, the enterprise cannot fulfill its functional purpose, achieve the set goals, maintain and ensure the required level of competitiveness.

The theory and practice of enterprise management is based on the direct relationship between the strategic decision-making system and the risk assessment system and the business as a whole. Errors in making certain management decisions are often related to errors made in the process of analyzing and evaluating the current situation. This ultimately leads to failures in the implementation of strategic plans and affects business sustainability, which is why the article focuses on the methodological aspects of developing solutions and assessing business sustainability. In this regard, there is a need to improve the management mechanism due to the possibility of achieving a synergy effect between the elements of the management system of the enterprise's sustainable development (Yermekova, Romanenko, Zhanibekova, Aitzhanova, Apakhayev, 2024).

The risk management system in enterprises allows the analysis of theoretical sources related to the integration into the management system. The importance of the schematic management model, which is difficult to implement and needs to be simplified, is particularly evident in the conditions of increasing uncertainty. Because risk management requires quick action, situational assessment and decision-making. In this regard, it is appropriate to rely on models that involve the creation of simplified models simulating complex business processes (Amrahov, Mirzazadeh, Taghiyev, Muradov, Hamidov, Karimova, 2023).

Based on the task of creating simplified models and schemes for risk management and the strategic development of the enterprise as a whole, it is necessary to refer to the works of a number of other researchers. These researchers refer to the decision-making subsystem as one of the main, integrative elements in the risk management system, the decision-making process is associated with the knowledge factor in technology and organization (Mirzazadeh, Zeynalli, 2024). The authors propose a model that has proven itself successfully in high-tech startups. The model is also applicable in industries involved in mass, serial production of products.

Identification and prevention of risks should be carried out at each stage of strategic management, at each step, each possible risk requires the development of a management decision related to the company's strategic development plan. The optimal solution is possible only with the implementation of a timely and methodologically justified assessment of the enterprise's risks and sustainability indicators (Mirzazade, 2023).

It is indeed very difficult to successfully implement risk management without a reliable assessment of the risks of the external and internal environment. Accounting and risk assessment based on the concept of sustainable development should be comprehensive, which implies the existence of economic, social and environmental indicators (Osinubi, Ajide, 2022). When assessing risks, it is appropriate to focus on universal methods that offer an integrated approach to risk management. Thus, it is important to use resource, indicative and index approaches as a basis for assessing the enterprise's risks (Sakkaraeva, Abdurashitov, 2024). This allows achieving a balance of applied criteria, linking different indicators and taking into account more precisely the risks and consequences of their effects. Thus, the analysis and evaluation of the sustainable development strategy includes the application of quantitative and qualitative indicators, allows to respond in time to the challenges of the environment, to determine and calculate the amount of resources needed to adapt the company to risks, the possibilities of reproducing the activity (Isakov, 2010).

Resource and indicative-index approaches are chosen as the main ones for evaluation. The resource approach assumes the distribution of the main quantitative characteristics in the organization and management of ecological and economic systems (Amrahov, Mirzazadeh, Guliyeva, Gazanfarova, 2024). The indicator-index approach allows to add possibilities of assessment of the resource approach, helps to assess the impact of the enterprise on the ecosystem and social environment. A comprehensive assessment involves at least three groups of indicators: assessment of the economic component, the social component and the environmental subsystem (Amrahov, Hajiyeva, Mirzazadeh, Taghiyeva, Karimova, Karimov, 2023).

Thus, the main components of risk management include the business evaluation subsystem and the decision-making subsystem. The peculiarity of including the risk management system in a single company management mechanism is determined by the appropriate level of integration of these processes and components (Bogacheva, 2017). The risk management system covers all areas

of the company's activity and the interests of its participants as a subsystem for the management and development of the organization's activities. To implement and work effectively, the analysis of scientific works and work experience shows that it should be integrated into all management systems of the organization.

Conclusion

Optimal strategic management of enterprise stability, accurate assessment of risks, timely response to them and making adequate decisions are based on a well-functioning mechanism and algorithm of enterprise management activities.

The analysis of the theory and practice of management of sustainable development of enterprises allows to determine the main directions of improvement of risk management processes and mechanisms, where the main unifying components are the assessment and determination of the state of the enterprise.

The purpose of risk management is to fully or partially protect the resources of the economic entity or to obtain full income as a result of the decision made, which ultimately has a positive effect on financial stability. Depending on the purpose, the following tasks of risk management are distinguished:

1) collection, processing, analysis and storage of information about the external and internal environment;

2) formation of a set of enterprise risk factors;

3) determining the degree of danger of the identified risk factors;

4) development of risk management strategy and tactics;

5) development of the program of risky decisions, organization of its implementation, control and analysis of the results;

6) preparation of a program of risky investment activities;

7) implementation of insurance activities on risky decisions;

8) conducting appropriate accounting, statistical and operative reports on risky decisions, etc.

The first step in the improvement of the risk management system in enterprises is the creation of a specialized structural unit that carries out complex work in the direction of risk identification and cost assessment in order to further develop specific measures within the existing financial service. It should be noted that at first the unit will have only one employee - a financial risk management specialist. Risk management can be entrusted to a highly professional risk management team or carried out with the help of a consulting company that performs this activity directly, but these options are quite expensive for the organization. For an organization, it seems more optimal to choose a specialist who has experience in this industry and who can develop risk management using the models, methods and techniques of risk theory based on available data for the position of financial risk manager.

The main principles of the development and use of risk management methods are:

1) determination of management methods for each type of risk determined by the results of the analysis;

2) reducing the costs of risk compensation by using all available risk management methods;

3) revising risk management in the direction of increasing the share of preventive measures and pre-event financing in the process of risk management, as well as increasing the scope of non-financial risks;

4) increasing the scope and types of the company's risks by changing the structure of risk financing without increasing insurance costs.

The choice of one or another risk management method is based on the results of the ranking of risks, which allows to highlight the priority risks of the management need position. Thus, to equalize the risk of inflation, it is important to take measures aimed at:

1) formation of the market price and control over the level of production costs;

2) increasing labor productivity through the automation of production and the introduction of new technologies;

3) marketing research (projects with a long payback period should be avoided);
4) development of a rational financial policy (minimization of cash and receivables).

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The Role of the Economy in Financial Markets: Digital Manipulation and Information Direction

Abstract

This research examines the transformation of financial markets under the influence of the digital economy and manipulative information, the effects of these transformations, and the misunderstandings that arise between buyers and sellers. Specifically, it investigates how market participants, including individual investors and institutional players, can counteract the effects of digital manipulation and information steering, as well as the strategies that can be employed to turn disadvantages into advantages in such an environment.

The study will analyze how major states, multinational corporations, and high-status individuals exploit informational advantages to intervene in financial markets, how brokers and other financial institutions use digital manipulation to create artificial price fluctuations, and how these processes result in financial losses while, in some cases, offering potential gains. The primary objective is to develop effective strategies that enable investors and traders to make informed decisions in response to these market distortions.

Additionally, the research will explore the fundamental principles of risk management, guiding new entrants in financial markets on which investment instruments to choose, which strategies to adopt, and which pitfalls to avoid. The impact of various factors on trading decisions, the role of market trends, and the application of fundamental and technical analysis methods in a manipulated digital environment will be thoroughly examined.

Furthermore, the study will investigate the development of economic psychology in an environment of digital manipulation and information steering, emphasizing rational decision-making and behavioral models. A particular focus will be placed on strengthening psychological resilience among investors, mitigating the effects of information overload, and constructing strategies based on objective market analysis to avoid falling into manipulative traps.

Ultimately, this research aims to comprehend the impact of the digital economy and information manipulation on financial markets, identify the risks posed by these phenomena, and provide individual investors with effective risk management strategies.

Keywords: *digital economy, financial markets, information manipulation, trading strategies, risk management, market psychology, price fluctuations, investor resilience*

Introduction

The financial markets and their various types differ in structure and functionality, allowing users to select the most suitable option based on their individual needs. Users may either directly engage in these markets or access them virtually through brokers, thereby transitioning from digital trading platforms into the broader economic landscape.

In the realm of digital financial markets, traders primarily operate within three distinct trading styles: binary options, stocks, and forex. Among these, certain mechanisms exhibit a manipulative nature, and, according to some sources, may even be classified as forms of gambling.

The influence of economic news, major corporations, governmental entities, and high-status individuals on these markets can result in unpredictable fluctuations and manipulated outcomes.

A particular focus will be placed on binary markets, examining their potential resemblance to gambling, strategies to counteract their manipulative aspects, and methods to safeguard traders from exploitation. Furthermore, the research will explore the broader role of financial markets in the economy, the nature of market manipulation, and the strategic dissemination of information to influence market dynamics.

Research

Digital financial markets perform the same fundamental functions as traditional markets; however, brokers act as intermediaries, enabling users to participate in virtual trading. Through these brokers, individuals can engage in trading across forex, binary options, and stock markets.

A crucial aspect of virtual trading is understanding its underlying mechanisms. Once a trader successfully completes the security registration process with a broker, they gain the ability to deposit funds into their virtual wallet. After making a deposit, the trader assumes full responsibility for their transactions, as brokers, according to their protocols, bear no liability for any losses incurred.

The next step involves choosing a trading avenue: binary options, forex, or stocks. While all three operate on similar principles, they differ in execution. In the stock market, a trader invests in shares of a chosen company or currency, effectively becoming a shareholder. Their profits and losses are directly proportional to the rise and fall of the share price. This type of trading does not impose a time limit; traders can close their positions at any time, provided the market for their selected asset is open.

Forex trading, however, presents a different structure. Instead of acquiring ownership of a stock, forex traders speculate on the price movements of assets, earning profits or incurring losses based on their predictions. Investments are made in a chosen asset, company, or currency, and traders set an entry price. Their trade's outcome is determined by fluctuations in price. A notable feature of forex trading is leverage, which artificially amplifies the size of a trade, allowing for higher profits but also increasing the risk of greater losses. Unlike stock trading, forex does not impose a time limit, though it includes liquidation and closure price parameters. If a trade's loss reaches the investment amount, the position is automatically closed, resulting in a loss. However, there is no cap on potential profits; traders can close their positions at any desired profit level.

To mitigate risks, forex markets offer stop-loss and take-profit mechanisms, allowing traders to predetermine acceptable loss and profit levels before initiating a trade. This is particularly beneficial when traders are away from the market, ensuring their positions are managed automatically. Additionally, setting a stop-loss at half the total trade volume allows traders to enter high-volume trades while limiting potential losses.

Binary trading, on the other hand, differs significantly from both forex and stock trading. Various sources classify it as deceptive trading or even gambling. Similar to forex, binary trading involves price predictions; however, each investment index comes with a predetermined payout percentage, which fluctuates throughout the day. If a trader invests in an index with a 90% payout, their profit will consist of their initial investment plus 90% of that amount. In contrast, losses always equal the invested amount. Notably, binary trading platforms never offer a 100% payout, ensuring that brokers never provide returns exceeding the initial investment.

Another major distinction is that binary trading enforces strict time constraints. When placing a trade, a trader must specify the duration within which their prediction will be valid. If the predicted movement occurs even a fraction of a second after the set time frame, the trader loses their investment. Similarly, if the prediction is incorrect but the price moves slightly in the right direction at the last second, the trade is considered successful.

All three trading markets—binary, forex, and stocks—operate on similar underlying assets, including companies, fiat currencies, and cryptocurrencies. To make accurate predictions, traders must conduct three essential types of analysis: technical, market, and experiential analysis.

Technical analysis involves using various methodologies to assess price movements. Two primary tools for this are indicators known as oscillators and alligators, which function as advanced technological calculators. They measure market volume, volatility, greed index, peak points, and the strength balance between buyers and sellers (bulls and bears). The difference between these tools lies in how they display information: oscillators present data as numerical charts, while alligators visualize price movements using Japanese candlestick patterns. Additionally, traders rely on pattern recognition, which is based on the belief that market behavior is algorithmic and repetitive. Recognizable patterns serve as indicators of potential future movements, allowing traders to anticipate upcoming trends.

Market analysis follows, though it may sometimes precede technical analysis. Here, traders examine news and external factors affecting their chosen assets. For stocks, this involves reviewing company-related developments, investments, and market sentiment. For currencies, economic news releases play a crucial role, as scheduled financial reports can drastically shift market trends. Even if all prior analyses suggest a favorable outlook, a sudden news event can reverse market movements, complicating decision-making. Since trading is essentially a competition between buyers and sellers, poor timing—either too early or too late—can lead to losses.

At this stage, experiential analysis becomes critical. Based on experience, a trader must assess whether a given market situation represents a profit opportunity or a loss trap. However, this is far from easy. While traders compete against each other on the surface, their real competition lies with major corporations, countries, high-profile investors, and, most notably, brokers. Brokers exploit traders' greed, keeping them in a state of continuous engagement. Meanwhile, influential investors—often called "whales"—manipulate the market through large-scale investments, news releases, or even mere statements. These actions create artificial imbalances, which they then exploit for personal gain. Many traders, unaware of these manipulations, find themselves repeatedly incurring losses.

Among all trading markets, binary trading presents the highest risk. Unlike forex and stock trading, binary platforms are designed with user-friendly UI/UX interfaces to appear visually appealing and intuitive. This deliberate design choice aims to lower traders' psychological barriers, making them feel comfortable and confident, ultimately encouraging continued engagement and investment.

Binary options trading conducted through "exchange terminals" remains a contentious issue in both economic and legal discourse. While these activities are linked to financial markets, concerns persist regarding their similarity to gambling and their potential exploitation of regulatory loopholes for manipulative practices (Samaha, 2013, pp. 210-211).

Exchange terminals resemble traditional slot machines and are often installed in public spaces, including areas near schools and social institutions (Izumova, 2013. pp. 80-84). Equipped with cash acceptance mechanisms, these devices enable users to place bets on the price fluctuations of various currencies and assets under the guise of "exchange trading." However, participants in such transactions do not acquire actual ownership of the underlying assets; instead, they merely predict price movements within a specified timeframe. As a result, several jurisdictions have classified these terminals under the category of gambling devices rather than financial instruments. Judicial rulings across various countries have increasingly categorized such activities as gambling rather than legitimate financial trading (Cherry, List, 2001, pp. 256).

Regulatory authorities, including the U.S. Securities and Exchange Commission (SEC), the Commodity Futures Trading Commission (CFTC), the Monetary Authority of Singapore (MAS), and the French Autorité des Marchés Financiers (AMF), have issued warnings about the high risks and fraudulent nature of binary options trading (Ladouceur, 2004, pp. 501-503). These platforms often impose profit limitations while maximizing potential losses, as the trading conditions are predominantly controlled by brokers. Notably, the well-known brokerage firm Banc de Binary was fined $11 million by U.S. regulators for engaging in illegal binary options trading. Global regulatory investigations and sanctions have demonstrated that this market is frequently exploited for fraudulent activities (Terry, 2007, pp. 293).

Law enforcement agencies and central banks are taking measures to regulate binary options as illicit gambling rather than as financial instruments. A critical issue is that these terminals do not provide actual access to financial markets; rather, they create an illusion of trading through a visual simulation while remaining fundamentally disconnected from real market participation. Stricter regulatory oversight of binary options trading is necessary, along with a legal reclassification of exchange terminals as gambling devices rather than financial tools. Strengthening legal frameworks and ensuring transparency in trading conditions are essential steps toward protecting investors and preventing market manipulation (Erianto, Hanafi, Lubis, Siregar, 2024, pp. 44-46).

In trading, investors (traders) must be experienced and psychologically prepared for market fluctuations. The most challenging and crucial aspect of trading is the psychological factor, which itself is a matter of experience. Maintaining composure under pressure is one of the most demanding responsibilities of a trader, as they constantly navigate a fine line between greed and loss. Even millisecond-level interventions can alter the course and outcome of an entire trade (Saito, Oda, Gemba, Kubota, 2025, pp. 24-28).

At the moment of opening a position, traders often experience psychological anxiety due to the possibility of an unfavorable outcome. This fear can lead to impulsive decisions, causing them to open a trade prematurely or delay execution, potentially missing valuable opportunities. Similarly, during the trade, a trader who lacks emotional discipline might close a position too early due to fear, failing to reach the predetermined profit target. Conversely, at the closing stage, traders sometimes hesitate to exit a trade in time, allowing losses to accumulate.

To mitigate these risks, traders employ psychological strategies, risk management techniques, and trading tools. Among the most fundamental tools are Take Profit (TP) and Stop Loss (SL) orders, which allow traders to define their acceptable levels of profit and loss before initiating a trade. This approach removes the emotional burden during the trade and ensures objective decision-making. Once these parameters are set, the trader has minimal further interaction with the broker, as the predefined limits automatically trigger trade execution. However, setting these levels incorrectly can lead to significant losses (Xie, Wu, Zhang, Li, 2020, pp. 34-49).

There are several risk management strategies, including structured approaches that set limits on trading volume. One common rule suggests that a trader should only risk 1% of their total deposit per trade, ensuring that even in the event of consecutive losses, the capital remains recoverable. Additionally, experiential strategies play a role, but psychological resilience remains the most critical factor. For beginner traders with limited experience, the best approach is to set Stop Loss and Take Profit levels in advance and step away from the trading platform, as stress often leads to impulsive decision-making. It is essential to remember that in a buy trade, a price decrease is considered a loss, while in a sell trade, a price increase results in a loss.

However, binary options do not offer these risk management mechanisms. Unlike other trading methods, binary options do not allow traders to set Stop Loss or Take Profit orders, meaning that risk control is entirely removed. Additionally, the profitability of binary options is inherently capped, as traders never receive a full 100% profit on successful trades. This structure fundamentally disadvantages traders employing risk management strategies, as it places them at a perpetual recovery deficit. In a standard scenario, traders must win at least six consecutive trades at a fixed amount to compensate for five prior losses, while in other trading methods, a single well-executed trade can recover previous losses (Omicini, Ossowski, 2004, pp. 1-7).

Ultimately, while risk management strategies help traders maintain financial stability in most trading environments, binary options impose structural limitations that prevent effective risk control. The absence of adjustable loss limits and the inherent profitability cap make binary options a suboptimal choice for traders who prioritize strategic risk management.

Conclusion

Trading can be somewhat compared to chess. When the right moves are made, it is possible to achieve profit. However, it is more accurate to compare it to a board game like backgammon. A person with the experience to place the pieces in the correct positions and create the conditions for

doing so may win if luck also favors them. This is the nature of trading, and when correct trading is combined with a bit of luck, successful outcomes can be achieved. However, when trading correctly, examples such as stocks or forex can be given. On the other hand, binary trading is manipulated by large individuals, companies, and countries within the digital economy, driven by manipulation. Other trading methods may inevitably fall prey to such manipulation, but in those cases, the control is still in the hands of the trader. In binary trading, however, control is lost, leading the trader towards loss, which makes trading resemble gambling.

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Features of Formation of Risk-Management System in Enterprises

Abstract

At present, one of the most important aspects of the success of enterprises is the professional management of risks due to the formation of a risk management system. Risk management determines the ways and means of ensuring the stability of the enterprise, its ability to withstand adverse situations. The need to start developing and implementing risk management practices is mainly due to the fact that currently there are no real mechanisms for their financial support in crisis situations. On the other hand, risk management is a rather complex activity that requires significant costs of material and human resources. The lack of a common understanding of risk management leads to an unclear interpretation of the concept of "risk" itself and the diversity of its manifestations and the factors affecting its value, nature and content.

It should be noted that many authors understand the process of risk management aimed at reducing the degree of risk. The main goal of risk management is to determine ways to reduce it, given that time and resources are limited. Purposeful actions to limit and minimize risk in the system of economic relations are called risk management.

Keywords: *risk, management, decision, strategy*

Introduction

Risk management can be viewed as "a multi-stage process aimed at reducing or compensating damage to the facility during adverse events. It is important to understand that harm minimization and risk reduction are not adequate concepts. At the same time, various financial management mechanisms, such as insurance, provide compensation without affecting either the size of the damage or the probability of its occurrence (Ekimova, 2013).

The risk management system includes the development and implementation of economically justified recommendations and measures for a given enterprise aimed at reducing the initial level of risk to an acceptable final level. Such definitions are associated with the assessment of risk as a potential threat. Risk assessment and analysis processes are an integral part of the risk management process, and what is called risk management in the sources mentioned above should be referred to by decision makers as a possible response to risk. In addition, risk management should also allow for risky decisions (Amrahov, Mirzazadeh, Taghiyev, Muradov, Hamidov, Karimova, 2023). Therefore, taking into account the comments made, it can be argued that in practice it would be appropriate to understand how the management subject affects the object in the context of enterprise risk management (Isakov, 2010).

Research

Subjects of the risk management system are those related to decision-making in all areas of the enterprise and at all levels of management. Thus, the subject of risk management is, first of all, the head of the enterprise, as well as heads of structural divisions and risk managers. The objects of management in risk management are economic relations both inside and outside the enterprise. Undoubtedly, risk management should be based on the general principles of management, which include systematic, integrated, systemic, dynamic, purposeful, flexible and object-oriented management (Amrahov, Hajiyeva, Mirzazadeh, Taghiyeva, Karimova, Karimov, 2023):

- the sequence in which it is necessary to take into account all their interactions and interactions in order to manage risks. In addition, systemic relationships between different risk management tools should be considered;

- complexity - consists in the need to take into account the complexity of the management object and to use all risk management tools without exception to achieve positive results;
- dynamism that requires taking into account the constant development of the enterprise of risk management;
- sustainability, that is, it is necessary to continuously deal with risk management;
- purposefulness, which suggests that risk management should be carried out not randomly, but with certain goals in mind;
- flexibility and adaptability, indicating that the risk management system must adapt to rapidly changing conditions;
- it means taking into account the features of the management object, even characterizing the same enterprises with specific features that affect the efficiency of the application of a specific risk management tool.

It should be noted that the nature of the risk management system is specific, and this is reflected in the specific principles on which it should be based, namely:

It should be noted that the nature of the risk management system is specific, and this is reflected in the specific principles on which it should be based, namely (Liboreiro, 2023):

Among the issues of risk management methodology for enterprises, the most important is the identification of the main stages of this process. When studying this aspect, a number of authors dealing with risk management problems are of the opinion that the beginning of the risk management process is the identification and analysis of risks (Shebanin, Shebanina, Kormyshkin, Iu., Drobitko, Potryvaieva, 2024). But again, in the first stage of risk management, it is necessary to define the objectives in accordance with the above principles, for this it is necessary to define the object of risk management1 and the desired result. At the stage of identification for enterprises, the enterprise takes risks and determines the factors necessary to realize and describe all possible risks in this type of activity by determining its factors and causes. It is important to identify as many co-occurring risk factors as possible (Ismayilov, 2019).

The main point of the management process is analysis and evaluation, depending on criteria such as the degree of impact on the enterprise's activity, etc. It should be noted that in the analysis and assessment process, risks, risk-creating factors are separately classified according to external and internal factors. Nevertheless, the last step should be a comprehensive assessment based on the interaction of internal and external factors (Amrahov, Rahimli, Mirzazadeh, Ibrahimli, Valizadeh, 2023).

The risk-management system in enterprises includes the activities of the enterprise management as a whole, the enterprise's position in a certain market, any project, product, operation, etc. is related to Determining the acceptable level of risks, as a rule, is carried out depending on which assets of the company and to what extent they are negatively affected by risk factors (Liboreiro, 2023). Depending on the scale of losses, based on the concept of acceptable risk, a scheme is drawn up that includes a risk-free zone, a zone of acceptable, critical and catastrophic risks. However, the allocation of a risk-free zone corresponding to profit contradicts our understanding of the economic nature of risk, because it is the expectation of large profits associated with possible large losses, therefore, it is illogical to allocate a risk-free zone according to this criterion (Mirzazade, 2023).

Conclusion

In enterprises, the risk management system is the control of the existing process at each stage. The main task of control is to identify deviations from the planned results, to evaluate the effectiveness of the used risk management methods. The link in this system is a risk management information center that forms databases by collecting and processing data streams, namely:

- a lot of extrapolated information summarizing the previous development experience of the enterprise and the market;
- information obtained during the preparation of the solution;
- information obtained in the process of implementing the decision or the chosen strategy, including information about emergency situations;
- information obtained during risk analysis and assessment;

- information obtained during the application of risk management methods, etc.

The processing of these data streams leads to the creation of:

- risk monitoring archive;
- catalog of risk factors;
- bank of risk analysis methods;
- a bank of risk management methods.

It is well known that businesses are currently facing many types of risks. At the same time, the market risk is becoming more and more important, keeping a fairly high degree of influence of natural and climatic factors. This, in turn, suggests that it is necessary to strengthen the information block on market research. The database formation block is of great importance in the risk management process, as most of the steps in this process are based on existing data. In addition, this block should form a bank of information about the decisions made and the results of their implementation.

Risk management system includes management strategy and tactics. Strategic risk management in enterprises is the decision of the management to choose the direction of response to the main types of risks in order to achieve the goal. goals. A risk management strategy predetermines its tactics - specific techniques and methods for achieving the set goal under specific conditions. The task of risk management tactics in enterprises is to choose the most optimal solution and the most acceptable risk management methods in these economic conditions.

As part of the risk-management system in enterprises, it is appropriate to find the appropriate balance between threats and profitability and to understand what influence the management subject has on the object in order to ensure the successful operation of the enterprise in general. At the same time, risk management in enterprises should be carried out on the basis of general management principles, taking into account the characteristics of risk management and its special principles.

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Assessment of Economic Damage and Risk Analysis in Emergencies

Abstract

The article provides basic provisions and information on the assessment of damage caused in the field of economy in emergencies and risk analysis, as well as factors affecting objects. Here, the methodology for assessing economic damage as a result of the occurrence of risks and their analysis are presented.

Risk analysis and management is one of the most important directions in the training of specialists in the field of protection in emergencies, in ensuring the continuity of the development and operation of various national economic facilities in emergencies, in minimizing possible economic damage as a result of malfunctions in the operation of facilities or in ensuring safety in risky situations, including environmental protection.

The main assumptions here are determined on the basis of risk theory, i.e. activities in the field of analysis and management of environmental and economic risks. The methodology is the basis for the formation of factors, determining their stability in accordance with the methods of impact on the object under consideration, assessment of economic damage. Risk management is one of the important elements in ensuring a sufficiently reliable level of operation of the research object, its characteristics and sensitivity to various factors. Moreover, risks should be expressed not only in terms of cost, in the form of economic damage, but also in social and other indicators or forms. Examples include deterioration of the environment or human health, death or illness of animals, etc.

Risk is a combined factor of the probability of an undesirable event and its consequences. Risk can also be understood as a measure of danger characterizing the probability of an accident at a hazardous industrial facility and the severity of its consequences. According to another definition, risk management is a risk-based, purposeful activity aimed at implementing the best possible way to reduce risks to a level considered acceptable by society, based on available resource and time constraints.

Keywords: *economy, emergencies, risk, damage, safety*

Introduction

Currently, the assessment of damage caused to the economy in emergency situations and the development and justification of the most optimal action programs designed to effectively implement security solutions are the main element of such activities. The main element of such activities is the process of ensuring security, as well as the optimal allocation of limited resources to reduce various types of risks in order to achieve such a level of security of the population and the environment that is possible only from the point of view of economic and social factors. This process is based on environmental monitoring and risk analysis.

According to another definition, risk management is a risk-based, purposeful activity aimed at implementing the best possible option for reducing risks to a level that is acceptable to society, based on existing resource and time constraints.

Risk management is usually approached using subjective considerations and largely ignoring socio-economic aspects that determine the level of security of the individual and society.

Risk management is usually approached using subjective considerations and largely ignoring socio-economic aspects that determine the level of security of the individual and society. Ensuring the safety of people and their environment requires a methodology based on a quantitative analysis of the risks and consequences of the decisions made. Additionally, it should be noted that these decisions are made within the framework of a risk management system (Rodionov, 2020, pp. 9-35).

Research

The essence and purpose of monitoring and forecasting the damage caused in the economy in emergencies is to observe, control and predict the dangerous processes and events of nature and technosphere, which are the sources of emergencies, external factors that disrupt stability (armed conflicts, terrorist acts, etc.), as well as the dynamics of the development of emergencies, to organize their prevention and elimination, as well as to minimize the damage caused, and to determine the scale of problem solving. It should be noted that monitoring and forecasting of emergencies of a natural and technogenic nature is multifaceted in terms of its activity. It is carried out by many organizations (institutions) using various methods and means.

Individual dangerous events and potentially dangerous objects are compared with each other based on the scale of individual risk, and critical risks are identified. Protective measures are implemented in a rational volume within the framework of resource limitations arising from the socio-economic situation of the country.

The procedure for assessing technogenic risk for the region can be organized in the following stages:

1. Creation of a database for the studied region, which includes information on the geography, meteorology, topology, infrastructure, population distribution and demography of the region, locations of industrial and other potentially hazardous production facilities and objects, main transport flows, warehouses, industrial and household waste, etc.

2. Identification and inventory of hazardous types of economic activity, selection of priority objects for further analysis. At this stage, types of economic activity in the region are identified and ranked by the degree of danger.

3. Quantitative assessment of the risk to the environment and public health, including: quantitative analysis of the impact of hazards throughout the entire activity of the enterprise, taking into account the risk of emergency emissions of hazardous substances, analysis of the impact of hazardous waste and risk analysis for the transportation of hazardous substances.

4. Analysis of the infrastructure and organization of security systems. Includes: analysis and planning of measures during emergencies, taking into account the interaction of various services with state management and control bodies, as well as with the public and representatives of the population; analysis of fire safety systems and services, taking into account the fire hazard of enterprises, high-risk facilities, energy and energy carrier transport systems; analysis of the structure of environmental quality control in the region; examination and analysis of regulatory and legislative documents.

5. Development and justification of strategies and operational action plans designed to effectively implement security solutions and ensure the achievement of set goals.

6. Formation of integrated management strategies and preparation of operational action plans, including: optimization of costs for ensuring industrial safety; determination of the priority of implementing organizational measures to increase the stability of regional facilities during normal operation, as well as during emergencies, and to reduce environmental risks.

The use of the above measures and risk assessment will allow us to search for the type of risk management that will ensure safety both at the enterprise level and at the macro level on the scale of infrastructure and territories, and to make optimal decisions. For this, it is necessary to choose acceptable risk values. Risk is an inevitable accompanying factor of human anthropogenic activity. Risk is, in fact, a measure of danger. Therefore, the goal of risk management is to prevent or reduce injuries, destruction of material objects, property loss and harmful effects on the environment. To manage risk, it is necessary to analyze and assess it. Individual risk is determined by the probability of potential threats occurring in the event of dangerous situations.

The number of risk factors of the economy in emergency situations is determined by the following formula:

$$R_n = P_i (f; t) / L_i (f; t)$$

where R_n is the individual risk; P_i (f; t) is the number of deaths (mortality) from a certain risk factor f for a time unit t; L_i (f; t) is the number of people exposed to the corresponding risk factor f for a time unit t.

Individual risk can be voluntary if it arises as a result of a person's own activities, and mandatory if a person is exposed to risk as part of society (for example, in ecologically unfavorable regions, near sources of increased danger).

Technical risk is a complex indicator of the reliability of technosphere elements. It expresses the probability of an accident or disaster during the operation of machines, mechanisms, the implementation of technological processes, and the economic construction and operation of buildings and structures:

$$R_T = \Delta T(t) / T(f)$$

R_T technical risk factor; $\Delta T(t)$ – the number of accidents per unit of time t in the same technical systems and facilities; T(f) – the number of the same technical systems and facilities exposed to the general risk factor f.

The assessment of economic damage in emergency situations is intended for the prediction of damage caused by accidents of technogenic and natural origin, as well as in the investigation of emergency situations, the development of industrial safety declarations, liability insurance of organizations operating hazardous production facilities, the classification of hazardous production facilities by risk level, etc.

The assessment of economic damage caused at different stages of emergency situations, the problems of predicting emergency situations and planning measures to increase the effectiveness of protecting the population, production personnel and territories from the effects of harmful factors during accidents, disasters and natural disasters, as well as for the assessment of damage caused by emergency situations.

The methodology can be used during the training, design, construction, commissioning and operation of hazardous production facilities located in a separate territory or providing a single technological process, hydraulic structures, vehicles carrying dangerous goods, objects whose operation may include accidents that may cause harm to the life, health or property of other persons and the environment.

The methodology allows for the assessment of socio-economic damage from man-made and natural emergencies at the stages of forecasting and localization of emergencies within a year after the event (Vorobyov, 1998, pp. 3-13).

The assessment of damage from emergencies should be achieved using approaches and methods (techniques) agreed upon and approved for use by management bodies at various levels of the national economy (state, regional, sectoral). At the same time, it is possible to improve and refine industrial methods for assessing damage, develop more justified methods for assessing damage, taking into account new economic conditions, additional information on the impact of damaging factors of emergencies, changes in the regulatory framework and a number of other factors.

It should be borne in mind that both the approaches and methods used in practice, as well as new ones, allow us to obtain an assessment of damage, which is a more or less reasonable approximation to its actual value. In practice, damage is often considered justified when all interested parties agree on its amount (and, accordingly, the calculation method). In this regard, the validity of the damage assessment method can be considered a subjective concept. If all interested parties agree with the assessment obtained on its basis, then this method is not considered valid, its validity must be confirmed by law (law, regulation or other acceptable method).

Table 1.
Sources and factors of individual risk.

№	Source of individual risk	The most common risk factor for death
1	Internal environment of the human body	Hereditary genetic, psychomatic disease, aging
2	Victimity	A set of personal qualities of a person as a victim of potential dangers.
3	Habits	Smoking, alcohol, drug use, irrational eating
4	Social ecology	Poor quality air, water, food, viral infections, domestic injuries, fires
5	Professional Experience	Hazardous and harmful production factors
6	Transport links	Accidents and disasters of vehicles, their collisions with a person
7	Non-professional activities	Dangers caused by amateur sports, tourism, and other hobbies
8	Social environment	Armed conflict, crime, suicide, murder
9	Natural environment	Earthquake, volcanic eruption, flood, landslides, hurricane and other natural disasters

Investments in the regional economy to prevent and eliminate the consequences of emergencies are calculated using the following formula:

$$I_t = I_t^m + I_t^f + I_t^{sf} + I_t^{ss} + I_t^{in} + I_t^{pr}$$

where is investment in the period t for the prevention and mitigation of the socio-economic consequences of emergencies at comparative prices;

I_t – investments in the prevention and mitigation of the socio-economic consequences of emergencies, at comparative prices, in the period t;

I_t^m – investments in the prevention and mitigation of the socio-economic consequences of emergencies, at comparative prices, in the period t;

I_t^f – investments from the federal budget for the prevention and mitigation of the socio-economic consequences of emergencies, at comparative prices, in the period t;

I_t^{sf} – investments within the framework of the federal target program (investment program) for the prevention and mitigation of the economic consequences of emergencies, at comparative prices, in the period t;

I_t^{ss} – investments in the period t for the prevention and elimination of the socio-economic consequences of emergencies at the expense of own funds of enterprises, including attracted funds, at comparative prices;

I_t^{in} – foreign investments in the prevention and mitigation of the socio-economic consequences of emergencies (of a cross-border nature), in comparative prices, in the period t;

I_t^{pr} – other investments in the prevention and mitigation of the socio-economic consequences of emergencies, in comparative prices, in the period t.

The assessment of damage from emergencies should be formulated in such a way as to reflect the entire structure of cause-and-effect relationships from the moment of the emergency to the damage caused to economic entities and individuals.

In general, all approaches and methods for assessing economic damage from emergencies, implementing them, are divided into two main groups: direct calculation methods and indirect assessment methods.

Direct calculation methods, as a rule, reflect all elements of the chain of cause-and-effect relationships that cause economic damage to economic entities. They include the assessment of the effects arising between all links of this chain and the calculation of various components of the losses of the economic entity, expressed in value.

Approaches to the assessment of damage caused by emergencies based on the use of direct calculation methods are quite widely used in the assessment of losses of objects as a result of technogenic accidents and natural disasters, terrorist attacks. This is due to the fact that objects (territorial natural complexes, enterprises, residential areas) damaged by such events are usually characterized by a fairly clear structure, the value of their elements can be estimated more or less accurately (Akimov, 2004, pp. 200-234).

In this case, the loss of elements can usually be correlated with the power of the event (earthquake power, explosion power, fire duration). To obtain a reasonable and objective assessment of damage caused by emergencies (taking into account the causes and factors of damage occurrence), direct calculation methods are used, which predetermine the high accuracy of the damage assessment based on them. However, these methods are quite labor-intensive and difficult and require a large amount of initial information. As a result, their application in practice is not always possible.

Indirect assessment methods are less labor-intensive. They are based on the principle of transferring general patterns of action of damaging factors to a specific economic object. This principle is implemented using a number of standard indicators that convert the type and magnitude of the impact of the damaging factor into economic damage to the economic entity.

The general part of damage assessment methods consists in determining the distribution zone of damaging factors and their power, taking into account the features of the location of various elements (objects), from which the amount of physical (natural) damage they receive is determined. In turn, based on the structure and scale of natural damage, an estimated cost of damage to the object is obtained. For this, first of all, it is necessary to form a system of initial assumptions that determine the features of the formation of the structure of damage and the assessment of the value of each of its positions (in terms of costs incurred, lost profits, direct losses, etc.).

Ecological risk is the probability of an ecological disaster, disruption of the future normal functioning and existence of ecological systems and objects as a result of anthropogenic impact on the natural environment or a natural disaster. Undesirable ecological risk events can occur both in the direct intervention zones and beyond:

$$R_o = \Delta O\ (t) / O$$

where R_o is the ecological risk; $\Delta O\ (t)$ is the number of anthropogenic ecological disasters and natural disasters per unit of time t; O is the number of potential sources of economic damage to the environment in the area under consideration.

Rom is the scale of ecological risk estimated as the percentage ratio of the area of crisis or catastrophic areas ΔS to the total area of the biogeocenosis S under consideration:

$$R_o^m = (\Delta S * 100) / S$$

An additional indirect criterion of environmental risk can be an integrated indicator of the ecological cleanliness of the territory of the enterprise, associated with the dynamics of population density (number of employees):

$$O_T = \pm \Delta L = \pm \Delta M\ (t) / S$$

where O_T – the level of environmental compatibility of the territory; $\pm \Delta L$ – the dynamics of population density (working); S – the area of the study area; $\pm \Delta M\ (t)$ – the dynamics of population growth (working) during the observation period t:

$$\pm \Delta M\ (t) = G + F – U – V$$

where G, F, U, V are the number of people born, arriving in a given territory for permanent residence, dying and perishing, leaving for permanent residence in another territory (dismissed) during the observed period, respectively.

In this formula, the difference (Q-U) characterizes the natural increase in the population of the territory, and (F-V) characterizes the migration (staff turnover) of the population.

Positive values of the environmental compatibility levels allow us to divide territories according to the degree of environmental well-being, and negative values of the levels, on the contrary, according to the degree of ecological disaster. In addition, the dynamics of the level of ecological cleanliness of the territory allows us to judge the change in the ecological situation there over a long period of time, to identify zones of ecological disaster (demographic crisis) or prosperity (Husereau, Drummond, Petrou, 2013, pp. 367-372).

The assessment of damage to material objects from emergencies is carried out on a specific date and is expressed in the currency of the country where the damage was determined.

An expert approach can be used to determine the cost of damage for economic objects of various categories based on the requirements of relevant regulatory legal documents for assessing damage caused by emergencies, direct inspection of the object by an expert, collection and generalization of market data on the cost of similar economic objects (Yang, Wei, Jiang, 2022, pp. 125-138).

The indicator of damage caused by emergencies is given in terms of the current year, the period of operation of the object or the decommissioning of the object.

The final cost of damage caused by emergencies, indicated in the damage assessment act drawn up in accordance with the methodology and in the manner prescribed, may be considered recommended for the purposes of carrying out legal actions (transactions) with the object of assessment, if no more than 6 months have passed from the date of drawing up the assessment act to the date of submission or submission of legal actions (transactions) with the object of assessment.

Social risk characterizes the scale and severity of the negative consequences of emergencies, as well as various types of events and changes that reduce the quality of life of people. In fact, it is a risk for a group or community of people. This can be assessed, for example, by the dynamics of deaths per 1,000 people in the relevant group:

$$R_C = (1000 * (C_2 – C_1) / L) * (t)$$

where R_C is the social risk; C_1 – the number of deaths (deaths) in the study group per unit of time t at the beginning of the observation period, i.e. before the development of emergency events; C_2 – the number of deaths in the same group of people at the end of the observation period, i.e. at the stage of eliminating the emergency; L – the total number of the group (Kokoshkin, 2014, pp. 29-41).

The general scheme for calculating damage during emergencies is as follows:

• calculation of damage caused to individuals;

• calculation of damage to property of individuals and legal entities; calculation of damage to the environment.

In accordance with the existing classification of damage caused, legal and regulatory documents on the assessment of damage from emergencies are divided into four blocks, the application of which is carried out separately or in full - when the fact of causing complex damage is established, depending on the scale and volume of damage caused as a result of the emergency.

Direct damage. Direct economic damage from any impact includes costs, losses and damages expressed in monetary terms by this impact at a certain time and in a specific place. These are one-time costs aimed at carrying out rescue operations; the costs of evacuation, temporary accommodation, relocation of people from the natural disaster zone and the provision of emergency medical care to them; one-time payments to victims and their families; the cost of destroyed or damaged natural resources; the residual value of all movable and immovable property (housing

stock, utility infrastructure, communications, goods and unsold products, fixed and current assets of enterprises of all types of property) (Morozov, Shakhramanian, 2012, pp. 87-103).

Direct damage is often proposed to be understood as losses that arise in the economy during the current reproduction period and are expressed in the form of a deterioration in the relevant indicators of socio-economic development based on annual results. All other types of damage are classified as indirect losses, i.e. do not directly affect the economic indicators of the current year. Actual economic damage means losses that occurred as a result of emergency situations and must be estimated in monetary terms.

Direct economic damage, which characterizes the immediate destruction, deterioration, damage to any property and material resources, their removal from economic circulation in other forms (production activities, use for social purposes, etc.).

The components of direct economic damage, as a rule, can be documented at the "primary level" (organization, enterprise, municipality) on the basis of accounting data, property write-off acts and other documents that have a sufficiently high degree of reliability and can be verified.

Therefore, it can be said that direct economic damage is, in principle, documented economic damage.

The main difference between an individual and a legal entity when determining direct economic damage is the lack of accounting data and other official documents that would allow for an inventory of losses and a sufficiently unambiguous calculation of this damage. Therefore, for individuals, expert assessments of physical and economic damage caused as a result of emergencies should be the main ones.

The results of the determination (assessment) of direct economic damage during emergencies by a legal entity or individual are a necessary condition and basis for applying to state bodies or insurance bodies for compensation for the damage caused.

The main information on the scale of direct damage to economic facilities and the population can be obtained as a result of checking the volume of damage at individual facilities immediately after the end of the emergency based on inventory data. Inventory is a physical calculation of the assets of an enterprise and a reconciliation of its liabilities. In emergencies, an inventory of property and financial liabilities is mandatory (Bogdanov, 2001, pp. 230-265).

The peculiarity of the domestic economy is that direct damage to enterprises from emergencies or terrorist acts causes significant indirect damage in the social and household spheres of these enterprises, since in most cases large and medium-sized enterprises of the main industries: the fuel and energy complex, the mining industry, metallurgy, the defense complex, the forestry complex, etc. - perform urban planning functions in relation to districts of large cities, small settlements and villages.

Indirect damage. Economic losses due to any activity include forced expenses, losses, and damages resulting from secondary impacts (actions or inactions resulting from primary actions) of a natural, man-made, or terrorist nature.

Indirect damage, unlike direct damage, can manifest itself long after the moment of the initial action; does not have a clearly defined territorial affiliation and in most cases has the so-called "cascade effect", i.e. secondary actions (inactions) create a chain of subsequent actions (inactions) and, accordingly, indirect damage.

Economic risk is determined by the ratio of benefits and losses that society receives from the type of activity in question (Borisenko, Kovalev, 2003, pp. 55-71):

$$R_Э = (B / K) * 100$$

where RE is the economic risk, %; B – harm to society from the type of activity in question; K – benefit.

In general, it is defined as $B = Z_b + U_{sh}$.

where $Z_б$ is the cost of achieving a given level of safety; Harm is the damage caused by insufficient protection of a person and his environment from hazards.

Income is the sum of all benefits (in monetary terms) received by society from the type of activity in question:

$$P = F – З_б – B > 0 \quad \text{или} \quad P = F – З_п – З_б – M > 0$$

where F is the total income from the type of activity in question; $З_п$ – basic production costs.

Then the economically justified equation of the safety of life activity will have the following form:

$$M < F – (З_п + З_б)$$

In the context of economic activity, it is necessary to find the optimal ratio between security costs and possible damage from insufficient protection. It can be found if we set a certain value for the realistically achievable level of security of KBP production. This problem can be solved by optimization.

A distinction is made between individual and social risks. Individual risk characterizes the danger of a certain type for a particular individual. Social or group – this is a risk for a group of people. Social risk can be defined as the relationship between the frequency of events and the number of people affected.

At the level of an organization (enterprise), economic losses associated with the suspension of production are economic losses incurred as a result of the suspension, cessation, or reduction in the intensity of production and any other economically significant functional activity of the organization (enterprise) in terms of the production of products, the performance of work, and the provision of services of both a production and non-production nature.

From a macroeconomic point of view, the main impact on the most important indicators of the country's socio-economic development, including the volume of industrial production in the industry, the volume of industrial production in the country as a whole, the volume of final products, the volume of GDP, etc. is the suspension of production at enterprises (organizations) (Buyanova, 2007, pp. 14-21).

Unlike documented indicators of direct economic damage, which are obtained primarily on the basis of accounting data, losses associated with the suspension of production are calculated, obtained on the basis of planned economic and financial calculations and assessments. Some components of the damage (for example, an indicator of lost profits due to the suspension of production) can only be obtained at the level of estimates.

At the level of the organization (enterprise), economic damage to “third parties” is economic damage caused to other legal entities and individuals (the so-called “third parties”), economic entities, natural and other objects that are economically related to the reporting enterprise, but are not directly affected by emergency situations.

Among the indicators of this type of indirect economic damage, as an exception, there may be documented indicators (for example, indicators of economic damage due to the failure of the enterprise to fulfill its contractual obligations to related enterprises and consumers of products, indicators of civil liability for damage caused to other persons and objects).

However, in general, economic damage caused to “third parties”, as a rule, can be determined only at the level of assessment of the damage caused. The situation is further complicated by the need to take into account “cascade effects”, i.e. accounting for economic damage caused to related enterprises along the chain.

The problem of accounting for economic damage caused to “third parties” at the macroeconomic level can, in principle, be solved on the basis of systematic economic and mathematical modeling of the economy in emergency situations.

Summing up the indicators of economic damage to “third parties”, carried out by simply reducing (adding) the initial results without taking into account system effects, can lead to an overestimation of the results with the so-called “double counting”.

A significant component of indirect damage resulting from man-made, natural emergencies or terrorist acts is the damage caused to related enterprises in the technological chain, primarily to suppliers and consumers of the enterprise's products that have suffered direct damage as a result of emergencies or terrorist acts. This damage can also be determined only approximately.

A characteristic feature of indirect economic damage is that its components, as a rule, cannot be documented. They are determined using appropriate methods or estimated, including by experts.

In addition, due to the systemic nature of economic damage from emergencies and cascading factors, controversial provisions inevitably arise regarding the inclusion or exclusion of individual components in the composition of indirect economic damage.

In this regard, calculations or assessments of indirect economic damage, especially those that claim to fully take into account all components of the emergency factor, objectively have a sufficiently high degree of uncertainty and insufficient reliability (Buyanova, Inshakov, Lomovtseva, 2007, pp. 5-11).

As a result of emergencies, the production facility, which is the basis for assessing indirect damage in the initial period of the production loss cascade, may be destroyed. This cascade is formed due to the complex nature of inter-sectoral flows of intermediate products aimed at the production of final products in the economy.

One of the possible areas of application of cyclical calculations is the identification of critical nodes and deficit flows of products in inter-industry relations. This is expedient for minimizing the consequences of an earthquake in dynamics and for determining the sequence of measures for such minimization.

In the context of potentially increasing unemployment, indirect production losses are employment losses directly related to the cascade. If we assume a direct relationship between job losses and production reductions, then we can determine the potential indirect loss of unemployment as a result of an emergency in a given place.

In the structure of losses due to emergencies, cyclical losses of production are likely to play a leading role. Therefore, the above assumption about the direct dependence of job losses on production reductions is quite plausible. In reality, wage reductions may be combined with a reduction in employment (part-time work) or job losses and a reduction in employment. However, the complexity of calculations for such options is still controversial and has not yet received legal recognition in the international community.

Total loss. The occurrence of long-term losses from emergencies largely depends on the dynamics of the national economy. The likelihood of long-term consequences increases for the economic crisis situation, so the calculation of discounted losses is very relevant for countries such as Kyrgyzstan. Discounted estimates should reflect the value of future losses today.

The total loss Vk, taking into account the discount, can be calculated by the following formula:

$$V_k = \sum_{r=0}^{R_k} \cdot (V_{kr} / (1 + t)^r$$

where t is the discount rate; R is the period of reconstruction and recovery of the consequences; k is the year of the emergency (Vorobyov, 2010, pp. 10-14).

Total damage is the sum of direct and indirect damage. Total damage is determined at a certain point in time and is intermediate compared to total damage, which will be quantified over a long period of time. The need to take into account the time-distributed or delayed effects of damage is especially important for emergencies related to environmental impacts or exposure to radioactive materials.

Total economic damage accompanying an emergency, based on the above, can be defined as the sum of direct economic damage and indirect economic damage. The calculated dependencies are presented by the formula:

$$U = U^p + (A * U^k)$$

where A is the coefficient of reduction of costs at different times (discount coefficient); U – economic loss from emergencies; Up – direct economic loss; Uk – indirect economic loss.

At the same time, it should be taken into account that the differentiation of direct and indirect damage is to some extent conditional, since the same losses can be mediated in different forms.

Since the uncertainty in the amount of indirect economic damage is high, the amount of total economic damage also has a high uncertainty.

However, it should be taken into account that when solving various practical problems, the results of damage assessment (actual or projected) may differ significantly due to the inconsistency between the objectives of damage assessment, the methodological features of accounting, or the lack of consideration of individual components of economic damage - direct and indirect.

State statistical accounting of emergencies should be carried out on the basis of primary data, i.e. at the "primary level" - data generated in organizations (enterprises) and municipal bodies (Voronin, 2002, pp. 35-87).

At the same time, it is necessary to ensure the coverage of all organizations where systematic statistical observations are carried out in terms of collecting information on emergency situations.

Coverage of all territorial connections, which allows obtaining comprehensive (complete) information on the damage caused by an emergency situation at the level of the subjects of the country, and then at the republican level as a whole, should also be ensured.

The following should be added to the data of the systematic state statistical accounting of emergencies (Guzev, Abramova, 2003, pp. 43-54):

• data obtained from the statistical accounting and analysis of the department;

• results of scientific research, forecasting and analytical developments;

• materials of a private and selective nature obtained in the process of licensing, insurance, development of investment projects, business plans, etc.

Studying the risk of emergencies for the population and territories based on the probabilistic method allows building various risk assessment methods. Depending on the available (used) initial information, these can be the following types of methods:

• statistical, when probabilities are determined on the basis of available statistical data (if any);

• probability-theoretic, used to assess the risks of rare events when statistics are practically absent;

• heuristic based on the use of subjective probabilities obtained as a result of expert assessment (used in cases where not only statistical data, but also mathematical models are lacking in the assessment of complex risks arising from various hazards, or the models are too crude, that is, their accuracy is low) (Zarnadze, 2000, pp. 77-82).

Methods for predicting the occurrence of emergencies are most often developed in relation to emergencies of a natural nature, or more precisely, to the dangerous natural phenomena that cause them. A well-established national monitoring system of natural disasters and precursors of disasters is necessary for their timely prediction and detection at the stage of their occurrence.

Let us consider the features of the forecasting of the assessment of the socio-economic consequences of emergencies. In solving this problem, it is impossible to rely on experiment (with the exception of experimental data on the physical durability of individual technical elements and materials of special exercises). Extrapolation of statistical research data, which is widely used to predict economic processes occurring in the absence of emergencies, is also excluded. These circumstances sharply narrow the range of methods that can be used in forecasting. In fact, when forecasting the socio-economic consequences of an emergency for the country's economy, only heuristic methods and economic-mathematical modeling methods (or rather, an organic combination of these methods) based on the judgments of specialists-experts are used (Kalinina, 2008, pp. 8-14).

The peculiarity of emergencies, especially large-scale events, is that all of them, fortunately, can only be thought out and possible at the preparatory stage. Therefore, all work on the preparation and justification of decisions should be carried out primarily with descriptions and models of real

processes at the information level. This implies an exceptional, decisive role of mathematical modeling in solving this problem.

Conclusion

1. As the main result of the study, the analysis of the calculated parameters allows us to assess the degree of impact of the state economic policy in the field of emergency prevention on the development of each subject of our Republic and to develop substantive recommendations for its regulation.
2. Budgetary expenditures on reducing the socio-economic consequences of emergencies and expenditures of extra-budgetary funds on mitigating the economic consequences of emergencies are the predicted control parameters of the regions (empirical parameters), information on these elements of the final demand is taken from the analytical database.
3. A comprehensive assessment is carried out on the basis of comparing the selected indicative indicators of the socio-economic situation of the region with the average level, bringing all indicators to a comprehensive assessment and subsequent analysis of changes in the values of these indicators during the forecast period for certain regions. The parameter indicators used in the field of complex assessment are:
   a. index of the physical volume of industrial production;
   b. share of the region in the total volume of investments;
   c. financial security of the region - regional income per capita;
   d. communication development index (density of roads and telephone communication);
   e. unemployment rate (as a percentage of the economically active population);
   f. share of the population with incomes below the subsistence minimum;
   g. retail trade turnover per capita;
   h. ecological situation (share of emissions into the atmosphere and water).
4. Investments in the regional economy to prevent and eliminate the socio-economic consequences of emergencies can be carried out at the expense of funds from the constituent entities of our Republic, funds from the federal budget, own funds of enterprises, funds from foreign investors and other sources.
5. The basis of the proposed method for analyzing and forecasting the level of change in the gross regional product from the socio-economic consequences of emergencies is the equation characterizing the relationship between its production and use.
6. The complexity of forecasting the economic consequences of emergencies is due to the need for a comprehensive analysis of many interrelated parameters characterizing the socio-economic development of entities with different potential in the time interval from 1 to 15 years. The successful solution of this problem largely depends on the choice of rational methods for its implementation.
7. The main method of forecasting the economic consequences of emergencies is defined as variant economic-mathematical modeling based on the use of modern computer technologies.
8. Each of the methods provides not only the development of the area of economic activity in the current regime, but also its development. The specified areas of development within the framework of the problem under consideration should model the possibilities of preventing and eliminating emergencies and create a basis for quantitative justification of relevant measures and assessment of the necessary volume of resources (including financial funds) attracted for these purposes.

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The Origin and Development of Marketing

Abstract

The article discusses the history and development of marketing, which is currently one of the most important areas used to successfully operate in world markets and win the competition.

Marketing as a science has undergone a great development since the middle of the 20th century.

There are different opinions about the history of marketing. Thus, some historians claim that the emergence of marketing as a science began in 1900 in connection with the development of industry, while another group of scientists claim that it is older. However, when we pay attention to the dates of discovery of some of the tools used in marketing (Gutenberg's invention of the mass printing device for flyers and brochures in 1450, the publication of the first paid advertisement in a French newspaper in 1836, etc.), the emergence of marketing goes back to much earlier times.

The emergence and development of marketing is divided into certain historical periods.

1. Ancient times, primitive forms of manifestation - During this period, market relations began to emerge

2. Middle Ages, improvement - The impact of early discoveries on market relations increased even more.

3. Early 20th century, science and application - The influence of science and applications as a means of regulating market relations in the marketing industry, and the emergence of new tools began to expand.

4. Modern era - Electronicization meant more development.

Marketing as a science is found in one source in 1906 - 1911, and in another source in 1897 in the Journal of the American Economic Association (Bartels 1988, Brussiere 2000). In the Oxford English Dictionary, the date of origin of the word marketing coincides with the 16th century (Dixon, 2002).

The first teaching of marketing as an education did not begin in the United States, as many people think, but in Germany in the late 19th and early 20th centuries (Jones and Moniensen, 1990). At that time, market trends were studied from the specific to the general, and regularities were determined based on observations and experience.

Marketing, which has reached the modern era, was created in the United States and transformed into a system.

Keywords: *marketing, business, international business, advertising, market, production, sales, breed*

Introduction

Currently, the most important field used to successfully operate in world markets and win the competition is marketing.

Marketing as a science has undergone great development since the middle of the 20th century.

There are different opinions about the history of the emergence of marketing. Thus, some historians claim that marketing as a science began in 1900 in connection with the development of industry, while another group of scientists claims that it is older (Ashurov, 2008, p. 18-27). However, if we pay attention to the dates of discovery of some of the tools used in marketing (Gutenberg's discovery of a mass printing device for flyers and brochures in 1450, the publication of the first paid advertisement in a French newspaper in 1836, etc.), it can be traced back to an earlier time. These were the following.

1. Ancient times, primitive forms of manifestation – During this period, market relations began

to emerge

2. Middle Ages, improvement – The impact of early discoveries on market relations increased even more.

3. Early 20th century, science and application – The influence of science and application as a means of regulating market relations in the marketing industry, the emergence of new tools began to expand.

4. Modern era – Electronicization meant more development.

Marketing as a science is found in one source in 1906-1911, and in another source in 1897 in the Journal of the American Economic Association (Bartels 1988, Brussiere 2000). In the Oxford English Dictionary, the date of the emergence of the word marketing coincides with the 16th century (Dixon, 2002).

The first teaching of marketing as an education began to gain momentum in Germany from the end of the 19th century to the beginning of the 20th century, not in the United States, as many people think (Jones and Moniensen, 1990). At that time, market trends were studied from the specific to the general, and regularities were determined based on observations and experience (Churchill, Ford, Walker, 2011, pp. 2-38).

Marketing, which has reached the modern era, was created in the United States and has been developed into a system.

Research

One of the most important areas that is currently successfully operating in the international business sector and used to win the competition is the marketing field.

As a science, marketing has enslaved many thinkers, writers, and even ordinary people who have made great progress since the middle of the 20th century and turned them into market figures against the background of the development of market relations.

There are different opinions about the history of marketing. Thus, some historical scientists claim that marketing as a science began in 1900 in connection with the development of industry, while another group of scientists claim that it is older. However, if we pay attention to the dates of discovery of some of the tools used in marketing (the discovery of the mass printing device for flyers and brochures by Gutenberg in 1450, the publication of the first paid advertisement in a French newspaper in 1836, etc.), it takes us to an even older time.

The history and development of marketing can be divided into certain historical periods.

The history of the development of marketing is mainly divided into 6 parts:

1. Market period

2. Production period
3. Sales period
4. Brand period
5. Customer period
6. Value period

Marketing emerged with the emergence of the market, that is, the market. We know from history that the market emerged during the first great social division of labor: the first market place was the place where farmers and cattle breeders met to exchange the goods they produced. Why can we say with certainty that marketing emerged precisely during this period? Remember, before the emergence of money, there was a barter economy. In what ratio do you think the farmer should exchange wheat for the shepherd's sheep? Although there was no state that set these norms, both tried to agree on a ratio that was profitable for themselves. The shepherd praised his sheep and tried to buy more wheat, and the farmer had to convince the shepherd that his wheat was superior to that of his competitors in order to sell his goods. This process reminds us of marketing (Alirzayev, 2005, pp. 25-29; Kotler, 2008, pp. 12-20).

In the second division of labor, artisans appeared, and in the third, merchants. With the emergence of merchants, marketing entered a stage of development. We can call merchants the first professional marketers, because marketing was their breadwinner. Merchants study the market in detail, create new markets, classify people coming to the market into personnel at first glance, and an individual approach is applied to each client, which is how a profitable business is built. Merchants were able to acquire great wealth by skillfully using marketing. The owners of the greatest wealth put their money into circulation and became bankers.

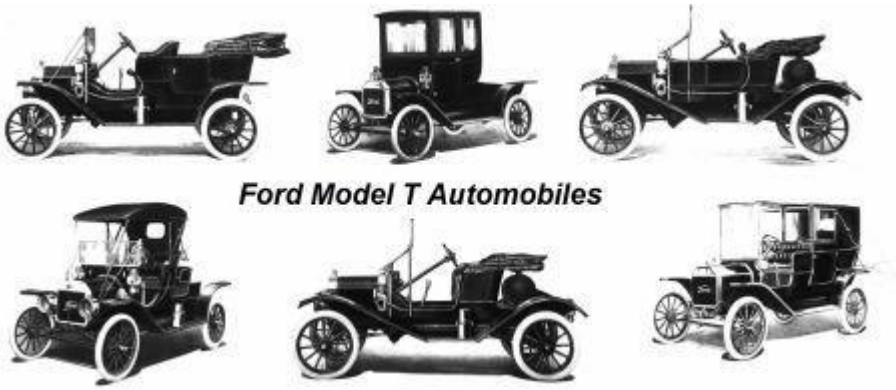
In the Middle Ages, international markets were created with the direct influence and participation of merchants and bankers. During the era of great discoveries, Europe became acquainted with the markets of India, China, Africa, and America. The first foundation of international marketing was laid in this century (Bagiev, Tarasevich, 2012, pp. 52-67).

One of the greatest discoveries in history that occurred during this period - Johann Gutenberg's printing press - raised marketing to a higher level. It was no coincidence that, along with printing books and newspapers (and perhaps more so), printing presses were used to print advertising posters. At one time, posters were so widespread that it was forbidden to paste posters on private houses in London.

2. The Marketing Production Era

The market era lasted until the fourth division of labor, that is, the industrial revolution. In this division of labor, two new classes emerged: the bourgeoisie and the working class. Until then, merchants and bankers, who had held socio-political power in their own hands, had to share power with the bourgeoisie. The same process took place in marketing. The bourgeoisie was engaged in industrial production, which is why we call this period the Marketing Production Era. What was the difference between this period and the previous one? With the industrial revolution, the era of mass

production began. For example, due to the high wool production in England, the textile industry began to develop sharply. After the British market was saturated with fabrics, manufacturers began to enter the European, and then the Middle and Far East, and American markets. Since the fabric was a homogeneous commodity, it was difficult to market it, and the only competitive advantage was the raw material quality of the wool. For this reason, manufacturers focused on factors such as reducing production and logistics costs and exemptions from export and import taxes rather than marketing in order to achieve high profits. The most beautiful expression that characterizes the era belongs to Henry Ford, who is considered one of the most powerful industrialists: "The customer can have a car in any color he wants, as long as it is black". With this statement, Ford notes that he was more interested in the interests of production than in the interests of the customer, because additional color meant additional production costs and lower production efficiency (Lamben, 2008, pp. 37-52; Mammadov, 2014, pp. 43-58).



During this period when marketing was at its weakest, a number of innovations also occurred: the first newspaper advertisement (1836), the first product placement (soap) in a motion picture for advertising purposes (1876), the first outdoor billboard advertisement (1867), and radio advertising (1922). No, marketing did not die completely, it continued to develop extensively at the small and medium business level. During this period, direct marketing experienced its golden age. It is no coincidence that salespeople who succeeded in direct marketing later founded many advertising agencies, such as David Ogilvy, who is considered the father of advertising. In the 1880s, with the emergence of patent law, the first trademarks and brands were founded (Sadikhov, 2012).

Marketing began to be recognized as a science, and in 1902, Edward David Jones taught the first marketing course at the University of Michigan. Although the first advertising agency was founded in 1786, these agencies were mostly engaged in placing advertisements in newspapers. "N.W. Ayer & Son," a full-service advertising agency in the classical sense, was founded in Philadelphia in 1869.

The production era of marketing ended during the Great Depression of 1929-1939. The main reason for the Great Depression was overproduction. Manufacturers competed to produce more and cheaper, without thinking about their employees, that is, their potential customers. In this crisis, they began to realize that something had to change in business and marketing (Zhang, Zhou, Andrews, 2025, pp. 3-6).

3. The sales era of marketing - The Great Depression was of great benefit to marketing. Manufacturers realized that it was necessary to sell and be able to sell the goods they produced, not by producing more and cheaper. The biggest factor that caused such a sharp change in the approach to business was the intensification of competition. It was no longer possible to compete in production: production processes had become technologically identical, the state had introduced a minimum wage, and with the development of sea transport, logistics prices were at their lowest levels in history. What did manufacturers have to change their focus to? Distribution of goods, placement in the market, and persuasion and promotion of customers. To compete in these four areas, they needed marketing, and marketers who knew marketing well.

The sales era of marketing was, in a sense, a period when salespeople played horses. Every

advertisement consisted of a sales message, every marketing tool was used to make a sale. The success of marketing was measured by sales figures. Nevertheless, branding also found its place in that era. Marketers who were sellers understood that selling once was not enough. For sales that sold themselves and did not require as much advertising budget for the next sale, it was necessary to make people love the product. To do this, people should not recognize the product, but love the brand. Thus, marketing entered its fourth era (Ashurov, 2018, pp. 33-40).

4. The brand era of marketing

After World War II, the market had already stabilized. There were no sharp revolutions, the population began to appreciate their own lives, to enjoy life (remember the hippies). Sales no longer worked, because people had a certain hatred for the consumer society. People began to make decisions about purchases on a psychological level. For them, the product they bought was no longer a thing, but a way of self-expression, an indicator of their status in society. Remember the classic cars of that time: Mustang, Cadillac, Corvette, Plymouth. Each was a brand of its own (Kotler, Aristorng, 2001, pp. 22-35).

This period was the period when the well-known military brands were created, developed, and gained leadership: Coca-cola, Apple, Burger King, Crest (which we know as Blendamed), Doritos, Lego, etc. In order to make people love the brand, marketers began to refine and improve the marketing tools at their disposal. For the first time, creativity became the driving force of marketing and advertising. Ordinary people began to love advertisements. Although the first TV commercial was broadcast in 1941, it was in the 60s and 70s that it was able to reach a wide audience. Telemarketing also experienced its golden age in those years (Küster, Vila, Canales, 2016, pp. 4-7).

While engaged in brand management, marketers discovered another truth. In order to make people love brands, it is necessary to get to know people better. The search for an answer to the question “How does a person become a customer?” led us to the fifth stage in the history of marketing.

5. The customer era of marketing

The 80s of the 20th century are one of the most significant years in the history of marketing. During these years, advertisers and marketers literally discovered the customer. In the 1980s, customer databases were created that laid the foundation for CRM, relationship marketing spread, guerrilla marketing took its rightful place, and the development of the Internet laid the foundation for the transition to individualized and personalized marketing. People, with their problems, needs, desires, and wishes, became the main focus of marketing. Even goods began to be produced differently: if they first thought about how to produce and then sell them, now goods were produced that met the customer's wishes and needs. The strength of a brand was measured not by more recognition or more sales, but by the percentage of loyal customers. Brands themselves began to resemble people, and each brand gained a brand identity. Marketers invented their most powerful weapon to capture customers: integrated marketing communications. In order to capture customers and maintain brand loyalty, all marketing tools work together as a single system, with one message, to achieve one goal. The customer is helpless in the face of this marketing attack, even if he runs away from TV, marketing finds him on the Internet. Even if he moves away from society, the invisible tools of marketing catch him on a remote mountaintop (Cieslik, 2025).

Customer-oriented marketing has experienced another leap in the era of the Internet and mobile devices. Social networks, cookie tracking mechanisms have turned people into open books for marketers.

6. The era of value in marketing

You may ask what is value. Value is the benefit given to a person. In what way? By solving any problem, fulfilling a desire or wish, the brand directly benefits its customer. We would not be wrong if we say that utility marketing is currently the most widely used and most effective marketing tool. It is no longer very difficult to push a customer to make a sale with original creative, artificial intelligence advertising tactics, and various sales promotions. The generation raised by the Internet wants entertainment, wants to see the value that their parents did not receive or learn. What does this generation say to brands? Don't sell me goods, first benefit me, entertain

me, then maybe I'll buy your goods (Deng, Shen, Guo, 2024, pp. 6-9).

Is the history of marketing over?

Is the seventh era ahead of us? Maybe we don't know, we are already living in that era? It's hard to say. We know one truth for sure that history is a science that is changing every second. The history of marketing is also like that. We will live and see (Hermanto, Astuti, Sugito, Triatmanto, 2024, pp. 5-8).

If Marketing, which combines humanitarian and formal sciences, has remained relevant from its inception to the present day, if it occupies its own place in the philosophy of companies that "change the world" and can change people's outlook on life, do you think it is possible to approach this science superficially?

Conclusion

Marketing can be said to be one of the most relevant fields that has emerged since ancient times and has developed to this day. Its development period can be shown as follows.

1. Market period
2. Production period
3. Sales period
4. Brand period
5. Customer period
6. Value period

Having passed a long period of development, this subject, which is the most important for people's life activities, remains relevant in the modern era.

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User Behavior Analysis on Websites With the Help of Artificial Intelligence Algorithms and Application Examples

Abstract

This article explores the applications of artificial intelligence in the field of user behavior analysis on websites and the potential of this technology. Artificial intelligence algorithms are widely used in various fields such as personalized content presentation by analyzing user behavior, enhancing customer experience through chatbots and virtual assistants, improving user experience, optimizing marketing campaigns, increasing customer satisfaction, and detecting fraudulent activities. The article explains how various technologies of artificial intelligence, including methods such as machine learning, deep learning, and natural language processing, are used to predict and analyze the behavior of website users. It also discusses the potential opportunities of artificial intelligence for more accurate analysis and prediction of user behavior in the future. The article highlights the growing role of artificial intelligence in user behavior analysis and shows what strategic advantages advances in this field provide for businesses.

Keywords: *artificial intelligence, user behavior, website analytics, machine learning, user behavior analysis*

Introduction

The extensive application of artificial intelligence (AI) in the analysis of user behavior on websites has been studied from various aspects in the existing literature. An analysis of previous works shows that the main focus is on the classification and prediction of user behavior. For example, the application of machine learning and deep learning technologies is recognized as an effective approach to provide personalized content and product recommendations based on users' past activities. This approach is especially widespread in the field of e-commerce and is widely used to increase customer satisfaction.

Research on the application of artificial intelligence to analyze user behavior on websites is extensive and has addressed the topic with various approaches. A review of previous works mainly emphasizes the role of AI in providing personalized content, improving user experience and achieving commercial goals. For example, it is shown how recommendations based on user behavior are applied to increase customer satisfaction on the Netflix platform. This article will examine how artificial intelligence is used in the analysis of user behavior on websites, which algorithms are used, and various application examples in this field (Shirinova, 2021).

Artificial Intelligence and User Behavior Analysis

The wide application of artificial intelligence (AI) in the analysis of user behavior on websites has been studied from various aspects in the existing literature. An analysis of previous works shows that the main focus is on the classification and prediction of user behavior. For example, the application of machine learning and deep learning technologies is recognized as an effective approach to provide personalized content and product recommendations based on users' past activities (Shirinova, 2021, s. 376). This approach is especially widespread in the field of e-commerce and is widely used to increase customer satisfaction.

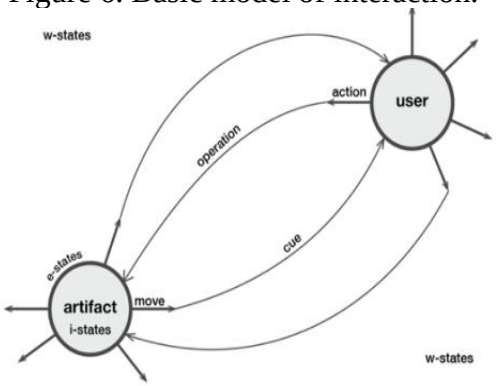
Research on the application of artificial intelligence to analyze user behavior on websites is extensive and has addressed the topic with various approaches. When looking at previous works, the role of AI is mainly emphasized in providing personalized content, improving user experience and achieving commercial goals. For example, Gómez-Uribe and Hunt analyzed the effectiveness

of recommendation systems on the Netflix platform and explained how recommendations based on user behavior can be applied to increase customer satisfaction. This study shows that personalized recommendations using AI offer content that is tailored to users' interests, which in turn keeps users on the platform longer (Maharramova, 2024, p. 12).

Another study was conducted by Riedl and Zanker, which explained how AI is applied in recommender systems across different sectors and how these systems are used to predict user behavior. They examined how AI is used in automated decision-making processes and to personalize the user experience, and presented various application examples in this area (Aslanzade, 2021, p. 194).

According to Janlert and Stolterman (Shirinova, 2021, p. 376), interaction can be defined as a user's action, understood as an operation by an artifact, and an "action" from the artifact. See Figure 6.

Figure 6. Basic model of interaction.



Source: Janlert və Stolterman, 2014

A brief explanation of the model and its key concepts may be needed. First, as explained in (Shirinova, 2021, p. 377), "states" are divided into two classes: internal states, or i-states for short, are functionally critical internal states of an artifact or system. External states, or e-states for short, are operationally or functionally relevant states of the interface, artifact, or system exterior that are observable by the user. Furthermore, world states, or w-states for short, are states in the world that are outside the artifact or causally related to the operation of the system (Shirinova, 2021, p. 378). The model details the activity on both the artifact and the user side. For example, states change as a result of user action or an operation triggered by the movement (action) of the artifact. These actions appear as a cue to the user. These cues are perceived by the user as either e-state changes or w-state changes. The model is intended as a tool for analyzing any form of human-artifact interaction. This serves our purpose well in exploring the relationship between automation and interaction. Based on the model, we can now define any form of "automation of interaction" as the removal of a pair of actions and actions from an interaction that leads to the same or similar outcome. We first focus on the extreme forms of the relationship between interaction and automation, namely, the absence of automation (full interaction) and the absence of interaction (full automation)

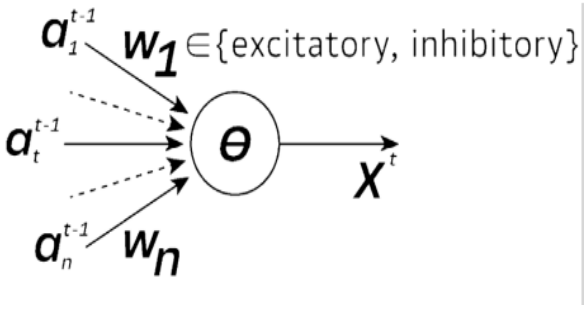
The Main Algorithms Used

In the development of artificial intelligence, there is a large field called machine learning, which studies the methods of building self-learning algorithms. In the absence of a clear solution to the problem, self-regulation and self-learning are required, and instead of finding the right solution, it is rational to create a mechanism capable of inventing, developing and suggesting the method itself to find the solution. Neural networks have advantages over traditional regression models and include the ability to approximate any continuous dependence function with automatic learning, universal work with different scales for measuring dependent and independent variables (Usubov, 2021, p. 385).

For a consumer who intends to order, buy or use goods only for personal, family or household needs, it is important to find motives, interests and triggers to make a purchase decision that is convincing in the new reality. Rational and emotional needs change under the influence of emerging new interests, immersion in virtual or hybrid reality, self-development and finding a balance between the new generation Y, Z, A, ecological, biological, anthropological, psychological, psychological, etc. moral, spiritual and technological information content of the world (Jafarov, Aliyeva, & Shirinli, 2020).

Neural network (artificial neural network ANN) was developed in 1943 by scientists Warren McCulloch and Walter Pitts and is presented in the form of a mathematical model, software or hardware implementation, built by analogy with the organization and functioning of networks of nerve cells (Fig. 7).

Figure 7. Warren McCulloch and Walter Pitts neural network model (Usubov, 2021, p. 6).



In the model, X is the input vector of parameters. W is the vector of weights (generally the matrix of weights). From the point of view of machine learning, an artificial neural network is a special case of using pattern recognition methods, discriminant analysis (interpretation of intergroup differences, classification of observations into groups), clustering methods (graphical, hierarchical). From the position of artificial intelligence, ANN, the philosophical movement of connection or the approach in the field of artificial intelligence, cognitive science, neurobiology, psychology and philosophy of consciousness, is considered a platform for modeling mental or behavioral phenomena with simple elements. From this point of view, ANN is characterized by the basic structural content of modeling natural intelligence using computer algorithms (Usubov, 2021, p. 387).

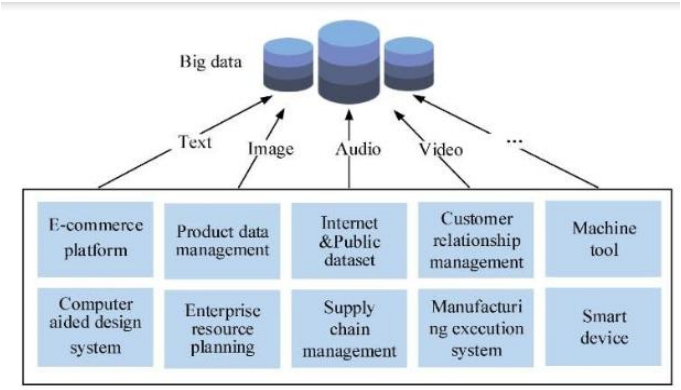
Researchers Skorobogatikh and Musatova focus on certain segments of consumers who are constantly in contact (connected consumers) and are active on the Internet. “Digital” consumers have constant access to the Internet (smartphones, tablets), but can represent different strata (income) groups, differ in age and social status (Kumar, 2019, p. 85). In the general group of “digital” consumers, we can distinguish the most active, young and creative consumers (Young Active Consumers) who participate in online sales processes. It should be noted that these consumers mainly live in cities, are well-educated, have high personal and total incomes.

The most active consumers are people aged 30-39 (32.4% of total consumption at the end of 2019). If in 2020 millennials dominated the structure of the working-age population (42.8%), then by 2036 their share will decrease to 40%, while the share of Generation Z in the labor force will increase from 15.2% to 29.7%. It is logical to assume that by 2029, the “alpha” generation, those born in 2013 and younger, will reach working age. Generation A is projected to constitute 16.6% of working-age Russians, marking a significant demographic shift that will influence the consumer market, societal needs, and prevailing attitudes. This emerging generation is likely to bring new priorities and expectations shaped by their upbringing in a highly digital, interconnected world. As digital natives, they may demand greater technological integration, personalized experiences, and sustainability-focused products and services. These changes will require businesses and policymakers to adapt to the evolving preferences and challenges posed by this influential cohort (Teymurov, 2023, p. 21).

Experts note that the application of neural networks is limited by the complexity of initial training, the high cost of building an optimal network architecture, the need to collect a large amount of data for building a training and testing sample, and the lack of knowledge. For most enterprises that use standard quantitative and qualitative marketing research and use mathematical analysis methods, problem solving is not always effective in a dynamically changing situation (Teymurov, 2023, p. 11). The introduction of neural networks into research activities will increase the level of cost savings for consumer research, free up specialists, and ensure the development of the most reliable forecasting model for effective interaction with customers and increasing the competitiveness of the company (Tewari, Pant, 2020, p. 17).

Understanding user behavior is essential for creating user-centered designs that meet the needs and expectations of target audiences. By analyzing user interactions, designers can identify usability problems, optimize user flows, and adapt designs to match user preferences, ultimately improving the overall user experience.

Figure 8. The Role of AI Algorithms in User Behavior Analysis



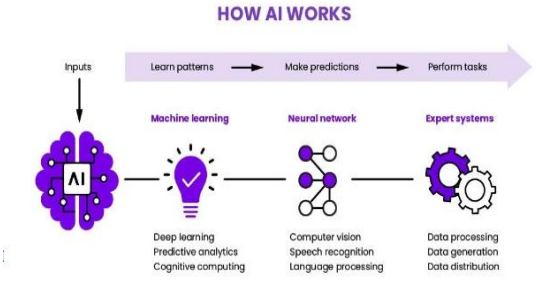
Source https://www.linkedin.com/pulse/how-ai-algorithms-used-analyze

AI algorithms collect and process large amounts of user data from a variety of sources, including website analytics, user feedback, and user interactions. By combining data from multiple touchpoints, AI algorithms provide a comprehensive view of user behavior, allowing designers to identify patterns and trends across different user segments (Huseynov, 2020, p x. 2).

AI algorithms use machine learning techniques to identify patterns and correlations within user data, such as common navigation paths, frequently accessed content, and user preferences. By recognizing patterns in user behavior, AI algorithms uncover insights that are not visible through manual analysis and help designers more effectively understand user needs and preferences.

AI algorithms use predictive analytics to predict future user behavior based on historical data and trends. By analyzing past user interactions and preferences, AI algorithms can predict user actions, preferences, and needs, allowing designers to proactively address user requirements and optimize design elements accordingly.

Figure 9. AI Applications in User Behavior Analysis



Source: https://intellipaat.com/blog/fraud-detection-machine-learning-algorithms/

AI algorithms power personalized recommendation engines that suggest relevant content, products, or services based on individual user preferences and past behavior. By analyzing user interactions and preferences in real time, AI algorithms provide personalized recommendations that enhance user engagement and satisfaction.

AI algorithms segment users into distinct groups based on shared characteristics, behaviors, or preferences. By segmenting users, designers can tailor design elements, content, and features to meet the specific needs and preferences of each user segment, maximizing relevance and engagement.

AI algorithms perform deep behavioral analysis to uncover user intent, motivations, and pain points. By analyzing user interactions, mouse movements, and engagement patterns, AI algorithms provide insights into user behavior, allowing designers to optimize user flows, eliminate friction points, and improve the overall user experience (Vahidli, 2021, s. 386).

AI algorithms can exhibit bias or unintended discrimination based on the data they are trained on. Designers should mitigate algorithmic bias by providing diverse and representative data sets, implementing fairness-aware algorithms, and regularly testing and monitoring algorithm performance.

As AI technologies continue to evolve, the capabilities of AI-driven user behavior analysis will expand, allowing designers to gain deeper insights and more accurately predict user needs. Advances in machine learning, natural language processing, and predictive analytics will further enhance the effectiveness and accuracy of AI algorithms for user behavior analysis (Vahidli, 2021, s. 387).

Despite the increasing role of AI in user behavior analysis, human judgment and empathy remain critical in the design process. Designers must balance insights from AI-driven analysis with human intuition, empathy, and creativity to create truly user-centered designs that resonate with users on an emotional level.

Application Examples of Artificial Intelligence

Artificial intelligence algorithms analyze users' past behavior and interests on a website to provide personalized content. For example, on e-commerce sites, artificial intelligence algorithms analyze information such as the products the user has viewed, searches, and items in their shopping cart. Based on this analysis, other products and services that the user may be interested in are suggested. Platforms like Netflix and YouTube also use artificial intelligence to offer users content that is relevant to their interests. E-commerce platforms like Amazon use artificial intelligence algorithms to analyze users' past shopping behavior, viewing history, and search criteria. For example, after a user searches for "camera," Amazon sends that user product suggestions related to cameras. This approach helps increase sales by increasing the product choices that are relevant to the user's interests.

Artificial intelligence plays a significant role in the development of chatbots and virtual assistants. These technologies provide real-time assistance to users on websites and mobile applications and interact with them interactively. For example, in the banking and customer service sector, chatbots answer user queries, solve problems, or make suggestions. Artificial intelligence-based chatbots understand and respond to user questions using natural language processing (NLP) technology. A virtual assistant named Erica, developed by Bank of America, assists customers with banking transactions. Using artificial intelligence and natural language processing technology, Erica answers customer questions, checks account balances, arranges bill payments, and provides users with financial advice. This improves the customer experience, prevents time loss, and increases customer satisfaction.

Artificial intelligence allows you to optimize the design and functionality of websites to improve the user experience. Algorithms analyze how users behave in different sections of the site and determine the most clicked or interesting pages. Based on this data, the interface of websites is optimized and the user experience is improved. For example, platforms such as Amazon and eBay

are constantly improving the layout and interface design of their websites with the help of artificial intelligence. Netflix uses artificial intelligence to create personalized content recommendations for each user. The user's viewing history, genre preferences, and ratings are analyzed. For example, if a user often watches romantic comedies, Netflix suggests new movies and series in that genre to that user. Such personalized recommendations lead to users spending more time on the platform and extending their subscription period (Johnson, & Lee, 2021).

Artificial intelligence is widely used to increase the effectiveness of marketing campaigns. This technology analyzes users' behavior, interests, and shopping habits to create targeted ads and campaigns. For example, Google and Facebook aFdvertising platforms analyze users' personal information and online behavior through artificial intelligence algorithms and target ads according to their interests. This approach allows ads to be more effective and optimize advertising costs. Facebook Ads uses artificial intelligence algorithms to help advertisers accurately identify their target audiences. For example, a restaurant wants to target its advertising to people who live in the area, are in a certain age group, and are interested in healthy food. Facebook Ads analyzes this data and delivers the ad to that audience, thus increasing the effectiveness of the campaign and optimizing costs.

Artificial intelligence is also used to improve customer satisfaction. For example, user comments and reviews are analyzed using natural language processing algorithms to determine their satisfaction level. Based on this information, businesses can identify and resolve customer problems more quickly. As another example, quick-service food establishments use AI-based systems to measure and improve customer satisfaction. TripAdvisor uses AI algorithms to analyze hotel and restaurant reviews. It automatically identifies positive or negative opinions in user comments and calculates the customer satisfaction level of each establishment. This approach helps users make better choices and businesses improve their services.

Artificial intelligence is widely used to detect fraudulent activities on websites, including cyber attacks and fraud attempts. Algorithms analyze anomalies in user behavior to detect and warn of potentially dangerous activities. For example, in the fields of finance and banking, AI systems reduce the risk of fraud by monitoring suspicious transactions and actions in users' account data. PayPal and other payment platforms use AI-based fraud detection systems to protect user accounts. For example, if a user's account is charged with an unusually large amount and this transaction is not consistent with the user's usual behavior, the system automatically blocks this transaction and warns the user. Such measures are effective in preventing cyberattacks and fraud attempts.

Conclusion

The application of artificial intelligence (AI) technologies in the analysis of user behavior on websites creates broad opportunities for businesses to succeed in the modern digital world. Through technologies such as machine learning, deep learning and natural language processing, it is possible to understand user behavior more deeply, provide personalized content and improve user experience. The use of artificial intelligence in areas such as e-commerce, banking, media and marketing offers various advantages such as increasing customer satisfaction, increasing the effectiveness of marketing campaigns and detecting fraudulent activities. The examples presented in this article show that artificial intelligence technologies are a powerful tool for increasing the competitiveness of businesses and increasing user satisfaction. In the future, with the development of artificial intelligence, more advanced methods and approaches will emerge in the field of analyzing user behavior on websites. This will create additional opportunities for businesses to make better decisions and implement more effective strategic planning. Thus, the application of artificial intelligence is not only a technological innovation, but also a necessary tool for achieving success in the digital world

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Analysis of Enterprise Management System

Abstract

The increasing role of the management system in the development of enterprises creates new opportunities and prospects for strengthening the position of local producers in the world markets. Improvement of management activities, implementation of management systems and their integration allow enterprises to reduce overall costs, increase management efficiency and meet consumer needs more efficiently. Currently, international standards for management systems have been developed in relation to almost all the main functional areas of enterprise activity. However, the existing management systems in most local enterprises operate separately, which makes inter-organizational communication difficult.

Analysis of the formation of relevant economic relations and their management in the activity of enterprises is particularly important. The profitability of the enterprise mainly depends on how effective management decisions and "management" itself will be. The responsibility of managers for the results of their activities and attention to the constant improvement of economic efficiency forces the management of economic entities to choose the most economical and efficient structures, flexible processes and management methods. It is for this that the analysis of enterprise management functions is necessary and important.

Keywords: *enterprise, management, management system, forecast, strategy*

Introduction

The purpose of the analysis of the management system in the activity of enterprises is to obtain reliable information about the state of management in the enterprise in order to increase the efficiency of management decision-making. To realize the set goal, it is necessary to solve a number of tasks:

- evaluate the state and efficiency of the existing management system and its elements;
- to determine the compatibility of the system with the characteristics of the tasks and the characteristics of the management object;
- to investigate problem areas and causes of deficiencies in the management system;
- to find out the causes of inconsistency and identify resources for increasing efficiency;
- to diagnose the development prospects of the management system and its individual elements, as well as the possibilities of adaptation to the predicted changes in the external environment;
- prepare measures aimed at increasing the efficiency of the management system.

Based on management functions in the enterprise, the following analysis objects can be distinguished (Yashin, 2012):

- planning of the enterprise's activities, that is, determination of compliance with plans and programs - strategies, goals and missions of the enterprise; analysis of the appropriateness of planning and programs in terms of their profitability;
- organization of enterprise activity: assessment of management norms, as many people as the manager can manage effectively; analysis of established mutual powers and duties; evaluation of the organizational structure of the enterprise;
- motivation of labor resources in the enterprise: evaluation of the motives that motivate employees to be active and the results of their application and analysis of factors influencing the activity of employees;

- the organization of control in the enterprise as a type of management activity, the task of which is to determine the actual state of work, compare it with the required one and prepare the necessary corrective measures.

Research

A feature of the control analysis is the selection of individual control elements, especially the connection and compatibility of the controlled and control system, as an independent control object: economic mechanism and management organization; organizational-production and organizational-management system; elements of the support subsystem (information, personnel, technical, etc.); different levels of management systems (Mazurin, 2019).

Thus, a complex unified method of management system analysis should include all its elements - functions, methods. The results of the analysis are the basis for assessing the significance of the management impact on the activity of the managed facility (Rabetino, Kohtamäki, Federico, 2021).

In the context of the development of free competition, the intensification of the life cycle of the organization, the application of flexible automated production and new information technologies, the efficiency of the enterprise is only intensive factors, etc. production resources are also important mainly to evaluate the organization's management system (Ajide, 2021). The analysis of the management system is most relevant when it is impossible to apply operational methods to reduce or maintain a stable level of costs, increase labor productivity, expand all shrinking domestic and foreign markets, or attract additional financial resources (Salimova, 2014).

Analysis of the management system is fundamentally necessary when making a decision to combine economic entities or significantly increase the scale of activity, expand the range of products, enter new markets, change the situation in the resource market, develop production processes and review the production process. The motivation for the analysis may be a stable overload or a change in senior management or the majority of the management team. Management systems analysis is relevant when there are deep and persistent disagreements over organizational issues, particularly the distribution of functions, rights, duties, responsibilities, powers, and other aspects of delegation.

When changing the strategy of the enterprise, the analytical process is inevitably accompanied by an adjustment in the structure, regardless of whether the production is diversified or homogeneous. Improvement of organizational forms often helps to develop new and more flexible strategic decisions. Redistribution of tasks, rights, duties, information flow, improvement or improvement of employee motivation helps to increase the efficiency of the organization by improving the management system (Mirzazadeh, Zeynalli, 2024).

Structural and strategically oriented innovative tasks cannot be solved independently of each other. Nevertheless, priority is given to the allocation of resources to the main programs that make up the strategy of the enterprise. The reason for this is that most of the serious problems in large enterprises are of a strategic nature. Despite the relevance, the scientific basis of target analysis has not been practically developed. There is no theoretical platform for the diagnosis of the organizational-functional structure and information system of the economic entity. A necessary component of the analysis of the management system is the assessment of management resources that determine the future of the organization.

These qualifications cannot be compensated for by rapid training in-house or by outsourcing. It is important to consider such a factor when allocating functions within an existing or planned structure. It is impossible to solve these issues without the choice of approach to the analysis of managerial personnel, the development of manual and automated evaluation technologies. In the analysis of organizational culture, there are also a number of scientific problems that largely determine the efficiency of the business entity's management system.

Methodological problems related to the selection of control subsystem diagnostics methods have not been sufficiently studied. Decisions should be based solely on traditional analytical models, ignoring the individual characteristics of decision-makers and, more importantly, their group interests. In many cases, the achievements of the economic entity are proven not only by quantitative indicators, but also by qualitative parameters such as the intellectual potential of the

management system, the influence of communication tools, the completeness and complexity of the use of information technologies, and the level of management. These factors cannot be accounted for with the current approach used by practitioners in analytical work.

The relevance of the problem of analysis of management systems of organizations, the fragmentation of the theoretical base, insufficient methodological and practical study of solutions predetermines the need for research in this field. The management system is not only a group of employees of the administrative apparatus, but also a set of interrelated blocks whose "structure" directly affects the contribution of each.

The existence of the target block is predetermined by the common goal (mission) of each organization, the implementation of which justifies its existence. The mission creates a system of sub-goals that are formed taking into account reality and defined values. The structural block is a set of management bodies, departments, executives, and the methods by which control measures are implemented. It can be described using organizational and functional structure and information system (Amrahov, Mirzazadeh, Guliyeva, Gazanfarova, 2024).

The organizational-behavioral block represents the management ideology, value system, interests and behavioral norms shared by the management team of the organization (Udalov, 2018). Structurally, it separates employees by the parameters that characterize them and socio-cultural relations between people-organizational culture. Blocks of the management subject, dynamically interacting with each other, are designed to regularly assess the management system and the results of the measures implemented for its development, which determines the success of the business subject. Within the framework of these blocks, the tasks of analyzing the efficiency of the management system, evaluating organizational and functional structures, information system, analyzing the potential of managerial personnel and organizational culture are solved (Sakkaraeva, Abdurashitov, 2024).

The complexity of the analytical study of the management system is explained by the fact that there are no universal inventions that formally and clearly present and evaluate the goal, structure and organization, such as the balance sheet. The specificity of management system analysis is that it cannot be presented as a task of formally selecting the best organizational decisions according to a clearly stated, unambiguous optimality criterion (Amrahov, Rahimli, Mirzazadeh, Ibrahimli, Valizadeh, 2023). It is a quantitative and qualitative problem solved on the basis of a combination of formalized assessment methods and the subjective activity of managers, specialists and experts. With the constant increase in the variety of research methods and the volume of knowledge collected by analysts, and the difficulty of their activities, there is a need to improve technical and organizational assessment tools (Eskindarov, 2016).

Conclusion

Analysis of the management system is one of the types of cognitive activity based on well-known scientific principles. The composition of modules, objects, methods and technologies for management system analysis is determined by the previously described structure of the management subsystem. Primary data and the result of the analysis are expressed through a system of indicators and parameters that describe the management subject. When analyzing a control system, it is recommended to use a combination of both computational and heuristic methods. Computational estimation methods are recommended for solving well-structured problems where the relationships of variables, constraints, and objective functions are clearly defined.

When making decisions in classic and non-standard management situations associated with poor structuring of problems due to deep changes in the organization's environment, analysts should use heuristic methods based on a combination of evaluation and pattern recognition, intuition. In heuristic theory, a representative and constantly updated arsenal of techniques used in all fields of knowledge is developed. When analyzing the control system, a combination of assessment and assessment-research can be used.

The most important features of heuristic methods are relying on the experience and knowledge of experts, their individual and collective judgments, alternative search in the range of real options, lack of an exact data transformation algorithm, and focus on providing acceptable solutions.

The initial stage of management system analysis is the sorting of certain source data using methods such as comparison, grouping, summation, detailing, balancing and leading transitions. Various elimination methods are used to reveal the intensity of functional relationships in the analyzed events and processes. When it is not possible to use simple deterministic models, the question arises whether to use stochastic modeling: correlation, regression, variance and other economic and mathematical methods.

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