

# **INTERNATIONAL REVIEW**

## **Special Issue No.1 Part I.**

### **Round Table**

# **DIGITAL TRANSFORMATION CHALLENGES**

**26. February 2021, Moscow, Russia**

**April, 2021.**

# **INTERNATIONAL REVIEW**

## **Special Issue No.1, Part I**

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## NOTE OF EDITOR OF CHIEF

This special issue of International Review is divided into three sections. The first section assesses some of the implications of globalization for the scholarly debate on *management, organisational behavior and culture* and related concepts. The argument is based, among other things, on the domestic and foreign experience in innovation management and increasing impact of digital technologies and organizational and economic mechanisms on change management. The second section discusses changes of *ecology and agroeconomy in the conditions of digitalization*. It is argued that these changes are shifting the role of ecological behavior, ecological culture and agroeconomy as well as dependence between human capital and production with a high level of automation in the conditions of digitalization. This leads to a discussion of the education and human resource management what is considered in the third section.

The special issue hosts diverse works that reflect and critically investigate the themes that make up the framework of this edition. We expect that this edition will provoke reactions from the scholars and will benefit researchers.

April, 2021.

Acad. prof. Dr Mirjana Radović-Marković

## **PART I. MANAGEMENT, ORGANISATIONAL BEHAVIOR AND CULTURE**

# DOMESTIC AND FOREIGN EXPERIENCE IN INNOVATION MANAGEMENT

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## Abstract

Although previous research highlights the advantages of external collaboration for the creative performance of an organization, little research has explored the role that collaboration plays across the various stages of the innovation process. The article discusses domestic and foreign experience in innovation management. In today's fast-paced world, the introduction of innovations and their effective management allows multinational corporations to create competitive products that have a high degree of knowledge-intensiveness and novelty. For effective innovation management, there are various models of innovative development, which in turn presuppose not only the creation of R&D divisions within the enterprise but also transform the economic mechanisms of the Corporation, which adapt it to constantly changing competition.

**Keywords:** Innovation, Innovation Process, Strategic Management, Industry, Management, Open Innovation Method

JEL: O30

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## Introduction

The most important characteristic of the modern world economy is innovation. The problems of innovation in an ever-evolving modern world are becoming increasingly relevant [20], [24], [25], [27].

The company understands that innovative development is the “mover” of various fields of activity, which is impossible without innovations in production, managerial, technological, marketing innovations, etc. Innovation plays the main role of updating the market, leading to the expansion of the range of production of goods and services, improving their quality and introducing new production technologies, marketing of products and the use of new methods of innovation management in organizations [34], [13], [9].

Innovation management is carried out by choosing an innovation process model that will be used in the further development of the enterprise. The innovation process is the process of transforming scientific knowledge into innovation [14], [32], [33], [29], [38], [39].

At present, competitors of one industry can use various methods of innovative processes in carrying out their activities. Some organizations, as in the past, spend huge resources on internal research and development, seeking to gain fundamental knowledge that would enable them to create new products or services in the future [22], [2], [37], [19]. Other organizations do not conduct or conduct very little of their own theoretical research, getting new ideas they enter the market from the outside - usually, this is cooperation or investing in companies that inspire confidence and reliability.

Organizations that act in this way without conducting their own research go on a par with the results of R&D of the world's leading organizations. Such organizations use the “open model” of the innovation process. The Open Innovations model, according to W. Lichtenaler, is the process of acquiring, searching for external sources of knowledge (technologies) and their effective application in the process of interaction with other companies [7], [12], [16], [36], [11], [18].

The Open Innovation model has the following main strategies:

1. Integration into a common fund for organizing research and development processes;
2. The development of individual components of an innovative product is carried out by different organizations;
3. Free sale of developments of wide application, which are used for various innovative products;
4. When making decisions in the innovation activities of large companies, the level of bureaucracy is reduced.

New modern models of the innovation process also appear, which are developed and used by companies.

## Methods

Given the accumulated experience of foreign countries and the new vector of the country in the transition from a raw material economy to an innovative one, it is necessary to study the accumulated knowledge and use modern tools for innovation management.

The innovative development of any company is a key factor in business development. Innovation management is one of the areas of strategic management of the company's top management, the purpose of which is to determine the main areas of production and scientific and technical activities of the organization in such areas as development and implementation of new services and products; improvement and modernization of products and services; product development; removal from the production of obsolete products [3], [21], [31].

The basis of the country's sustainable economic growth is the level of development and the dynamics of the innovation sphere - new technologies, science, knowledge-intensive industries. Progress in the scientific and technical field is changing the structure and scale of production and has a significant impact on the state of the world economy.

The experience of innovation management in both domestic and foreign companies shows the need for widespread implementation of innovative processes in all areas of the organization. The development and success of an organization depend on the correct and timely steps to improve the innovation management system at all stages of the product life cycle [15], [17], [30], [40].

The experience of innovation management gained by different companies shows the complexity of their implementation. You can quote the words of Henry Ford from the book “My Life — My Achievements”: “All social institutions of man for thousands of years have served the main goal - to protect against changes, or at least to slow down these changes [10]. Throughout history, changes were perceived as a disaster, and immutability was considered the goal of human organizational efforts.” In the modern world, the entire life cycle of a service or



product is decreasing at an enormous speed, and consumer requirements are increasing, competition is becoming more noticeable. Innovations are becoming one of the main reasons for the success of the company, and the effectiveness and survival largely depend on adaptation to the external environment, flexibility, variability of the structure and ability to innovate.

The life cycle of innovation is usually called the "innovation cycle", which consists of three stages and six stages:

- The first stage is the emergence of an innovative idea. The emergence of a new idea or concept of innovation;
- The second stage is the development of innovation (the emergence of innovation), the stage of invention. At this stage, an innovative idea takes on a material form, which occurs as a result of the implementation of scientific and technical activity (an innovation embodied in any object, spiritual or material product-sample);
- The third stage is implementation. Commercialization of innovation, i.e. turning innovations into innovations, introducing a product or service on the market for commercial use and obtaining economic benefits. This stage consists of 4 phases:
  - Innovation. At this stage, the innovation enters the market (trial placement), after which it is finalized, if necessary. Obtaining a sustainable effect from innovation ends with the stage of innovation.
  - Diffusion. Dissemination of innovation and its use in various sectors of the economy, including the process of promoting, disseminating and selling innovations. Diffusion cannot be identified with marketing innovation, because marketing - is a part of diffusion that does not have control from the organization (advertising innovation, the process of promotion and pricing of intellectual goods). An organization does not have control over another part of the diffusion process (a final consumer's story to his friend about the advantages and disadvantages of an innovative product or publication about innovations in scientific work).
  - The dominance of innovation. The stage where an innovation loses its novelty, in which case an effective alternative appears, or the existing innovation is replaced by a more effective one.
  - Downsizing. The final stage in which the innovation is replaced with a new product.
- Change in the scope of innovation at the stages of the life cycle (Figure1).

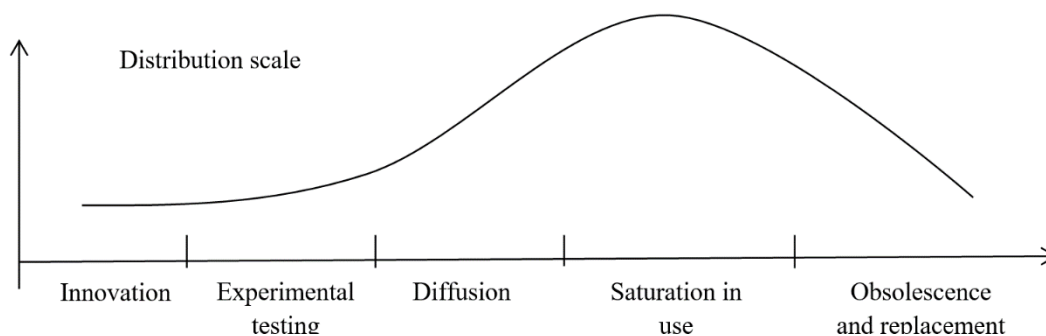


Figure 1. The life cycle of innovation [4]

The initial stages of the development of the innovation process, which are associated with the introduction and implementation of innovations on the market, are capital-intensive and pose increased risks that may arise due to the uncertainty of the results of the completion of innovation processes. Investment activity that is carried out at these stages is usually considered risky (venture).

Based on this, the innovation process is a sequential chain of events from the emergence of a new idea to its implementation in a particular service, technology or product and the subsequent dissemination of innovation. It so happens that between the two stages of the innovation process, there is a significant time gap that slows down the entire innovation process as a whole.

The driving forces of innovative processes include:

1. Competitive advantages - the "engine" of innovative processes in a market environment, which includes:
  - Increasing the profitability of the organization (increasing the market share of the product);
  - Advantages of a strategic nature (development of the company through the diversification of activities and markets);
  - Minimization of the costs of economic activity (restructuring of activities, reducing the number of defects);

- Benefits and special benefits (state support, soft loans).
2. State regulation can significantly accelerate innovation processes, stimulate enterprises of various forms in various industries, invest in the development of innovative services, technologies and products for successful development, including the goals of social, environmental and economic development.

The innovation process is implemented through innovation. Innovation activity - a type of activity related to the transformation of ideas (usually the results of scientific research and development or other scientific and technical achievements) into technologically new or improved products or services introduced on the market into new or improved technological processes or methods of production (transfer) of services used in practice. Innovation activity involves a whole range of scientific, technological, organizational, financial and commercial events, which together lead to innovation [28].

## Results and Discussion

A large role in innovation management for high technology sectors is played by government support measures - special financing programs, soft loans, tax incentives, various instruments for transferring exclusive rights from the state customer to the contractor for their further commercialization and profit, and others.

By analyzing the various experience of foreign and domestic companies, we can distinguish the main three areas of innovation in the industry - business, manufacturing and engineering. These three areas include such areas as after-sales service; organization of procurement; relationships with suppliers; innovation management; distribution of production; increasing production productivity and quality in production; computer-aided design systems; product life cycle management; environment (ecology); aircraft systems; aerodynamics and others [8], [35].

If we take the practical aspects of introducing new ideas, then, as practice shows when introducing innovations, along check is required, and a positive result is not guaranteed. In industry, the cycle from design to the introduction of new solutions reaches more than ten years. The high cost of performing the work, combined with the long lead times and the high level of regulations coming from the regulatory authorities, leads to difficulties for innovative companies since after certification of innovations they become available to competitors and the company loses all the advantages due to higher initial costs. Such conditions should serve as a basis for strategic decision-making by the management of companies to conduct R&D by their units or enter into various associations and alliances, both with domestic and foreign partners, using the open innovation model, the aim of which should be new knowledge, technologies and experience [1], [26].

The method of open innovation has become widespread in recent times, innovations and sources have changed significantly in terms of their organization, and these changes are most likely associated with a rapidly changing global technological base.

Despite the advantages of open innovation, there are risks associated with their use, which often repels companies. A survey of European companies showed the following concerns about applying this paradigm, as shown in Figure 2.

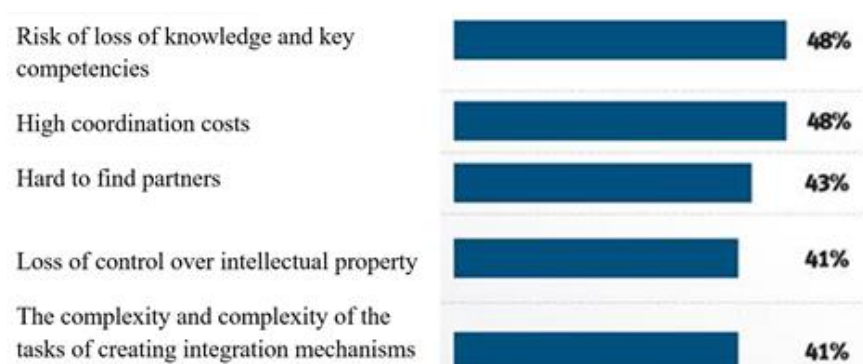


Figure 2. Risks of an open innovation model for a corporation (results of a survey of European companies)

Analyzing the above, we can conclude that the successful development and competitiveness of the company is possible due to an open innovation policy, but only in combination with competent management and analysis of all risks.

The innovation process, of course, took place in the industrial era, but it was greatly extended in time. Design bureaus and scientific organizations teamed up with enterprises to solve their tasks, but there was no question of attracting potential

consumers to develop innovative products. A very limited circle of performers was engaged in the creation of new technologies, new goods, services and their introduction to the market. Only since about the 1980s, speaking of the USSR, the heavy image of "mass demand" began to confidently be forced out of the market arena.

In Russia in post-perestroika times, the innovative component of the economy was practically forgotten, which was quite natural in the logic of the Washington Consensus, which implied the maximum removal of the state from participation in the economy in general and in support of its innovative component in particular. Nevertheless, it is safe to say that in recent years the innovative situation in Russia has changed dramatically, and at a very fast pace [23].

However, in the Russian Federation, the OI paradigm is increasingly being used. Many organizations are ready to support young innovators. They finance innovative projects or buy development and attract specialists themselves to work in their companies.

In Russia, there are a small number of institutions that support innovators. Among them: RVC OJSC, Skolkovo Foundation, Rusnano OJSC, Autonomous Non-Profit Organization Agency for Strategic Initiatives to Promote New Projects, and the state non-profit organization Foundation for the Promotion of the Development of Small Forms of Enterprises in the Scientific and Technical Field. Among the above institutions, it is necessary to distinguish RVC OJSC and the Skolkovo Fund, as they play a paramount role in maintaining a small innovative business in the Russian Federation.

The American economist Henry Chesbrough, speaking about the theory of "open innovation," argued that "in a world where knowledge is widely distributed, companies must engage third-party technologies in their business and open their technologies to other companies." [5], [6].

An example of open innovation is the association of Boeing, Embraer, EADS for the design preparation and implementation of aviation biofuels. The example clearly shows how competing manufacturers came together in order to achieve a common goal for the use of biofuels in air transportation.

An unconventional technological environment encourages companies to create collaborative work scenarios and more open innovative platforms, and companies increase the role of continuously managing information and various knowledge. Taking as a starting point, a common knowledge base and using a variety of sources of knowledge, the design and implementation of innovations in organizations can greatly increase [17].

The acquisition of various types of knowledge is based on partnerships between companies. In general practice, joint associations are most often used to create large technological changes, and existing technologies are developed by internal research and development work of organizations. Other forms of cooperation between organizations that do not provide for general participation in the capital are common in the case of additional technological changes (related and significantly affecting the organization's additional activities, but not significantly affecting the main one).

The scientific community has proven that various associations between enterprises can provide a competitive advantage in innovation for such associations.

## **Conclusion**

In order to increase corporate innovation, an important aspect is maintaining contacts with professional communities and universities. In various industries, there are many examples of successful cooperation. This interaction brings together industry, research centres and universities, and the purpose of this cooperation is to increase the competitiveness of industry under the prism of the development of general knowledge and through the improvement of educational programs and various training for students. In Russia, an example of such interaction was the conclusion of an agreement on long-term cooperation between the European concern EADS, St. Petersburg State Polytechnic University and the Russian Academy of Sciences, as well as a research centre, was created in the Skolkovo innovation centre.

The transition to digital technology and numerical modelling has become the main means of increasing production efficiency and reducing costs. All examples show how important it is for companies to implement innovative solutions in their business processes. Even taking into account the specifics of high-tech industries. We can draw conclusions about the need for innovative approaches and solutions in all aspects of organizations.

## **Research Contribution**

Joint associations are most commonly used in general practice to create significant technological improvements, and current innovations are created by the internal research and development work of organizations. The scientific community has shown that different associations between companies may provide those associations with a competitive advantage in innovation.

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## DIRECTIONS FOR IMPROVING THE MANAGEMENT OF CURRENT ASSETS IN THE ORGANIZATION

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### Abstract

The article discusses the directions of improving the management of current assets in the organization. Working capital is one of the constituent parts of the property of the enterprise. The state and efficiency of their use is one of the main conditions for the successful operation of the enterprise. The development of market relations determines new conditions for their organization. High inflation, non-payments and other crisis phenomena force the enterprise to change its policy in relation to working capital, look for new sources of replenishment, study the problem of their efficiency. Working capital management is important in solving the key problem of the financial condition: achieving an optimal balance between the growth of production profitability (maximizing the return on invested capital) and ensuring stable solvency, which serves as an external manifestation of the financial stability of the enterprise.

**Keywords:** Current Assets, Stability, Organization, Inflation, Management

JEL: M20

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## Introduction

In a market economy, all agro-industrial formations are interested in rhythmic and stable functioning. To achieve high results, you need a well-structured, grounded and effective financial policy.

An important component of the financial management system of agro-industrial enterprises has been and remains the mechanism for managing current assets [10; 14; 8; 9]. The fact is that the development of a perfect mechanism for managing the circulating assets of agricultural organizations and its effective application in practice is an extremely urgent problem at the present time, since the effective formation and regulation of the volume of circulating assets helps to maintain an optimal level of liquidity, ensures the efficiency of production and financial cycles of activity, and, consequently, a sufficiently high solvency and financial stability of agro-industrial enterprises.

## Methods

The economic essence of the working capital of agriculture is the same with the concept of working capital of industrial enterprises. At the same time, they have features due to the specifics of agricultural production. In this production, as a rule, the working time is significantly less than the production time. In some periods, the labor process stops, and the production process continues under the influence of natural forces. This is especially evident in crop production. After sowing or planting agricultural crops, the labor process stops until the work is carried out to care for the crops, which, according to agronomic rules, are carried out at regular intervals. Then there is a long break in the work process before harvesting. In this regard, material costs - seeds, planting materials, fertilizers, fuel and money - are spent simultaneously and with a long break. As a result, there is a significant unevenness in the need for working capital in different periods of the year [12].

The second significant feature of circulating assets is that a significant part of them is formed in kind, bypassing the monetary phase of the circulation. These are seeds, feed, organic fertilizers, young animals.

The third significant feature is the composition of the standardized own circulating assets of agricultural enterprises:

- productive reserves;
- unfinished production;
- Future expenses;
- finished products;
- debtors;
- cash.

The structure of working capital is characterized by a high proportion of inventories. They include: young animals and animals for fattening, seeds and planting materials, spare parts and materials for repairs, oil products, fuel, mineral fertilizers, pesticides and medicines, containers and container materials, low-value and wearing items [4].

Organization of circulating assets is fundamental in the general complex of problems of increasing their efficiency (Figure1).

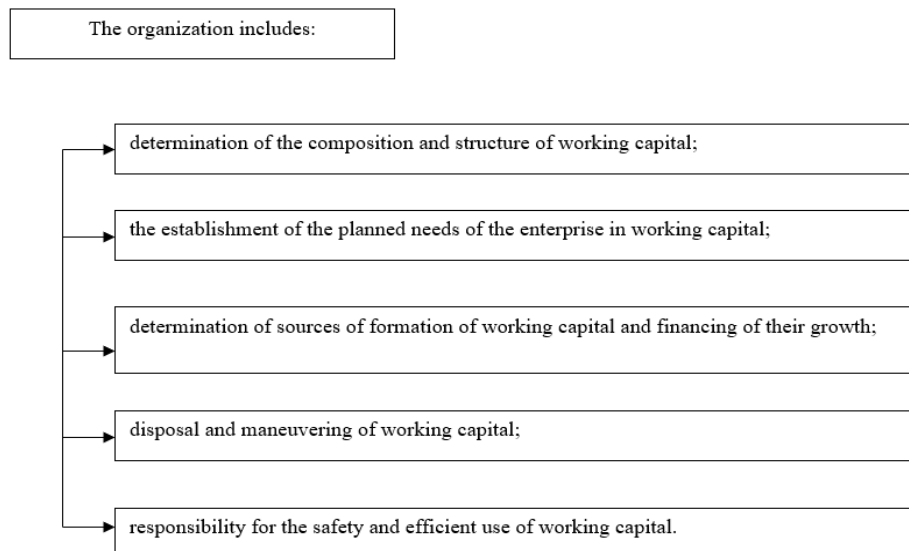


Figure 1. Problems of increasing the organization of working capital (Source: Author).

The management of current assets is understood to be the determination of their size, composition and structure.

The policy for managing the company's current assets is developed in the following main stages:

1. Analysis of the current assets of the enterprise in the previous period.

The main purpose of this analysis is to determine the level of provision of the enterprise with circulating assets and to identify reserves for increasing the efficiency of their functioning.

This analysis considers:

- a). Dynamics of the total volume of circulating assets used by the enterprise - the rate of change in their average amount in comparison with the rate of change in the volume of sales of products and the average amount of all assets; dynamics of the share of current assets in the total assets of the enterprise.
- b). The dynamics of the composition of the company's current assets in the context of their main types - stocks of raw materials, materials and semi-finished products; stocks of finished products; current accounts receivable, balances of monetary assets and their equivalents. At this stage of the analysis, the rate of change in the amount of each of these types of current assets is calculated and studied in comparison with the rate of change in the volume of production and sales of products; the dynamics of the share of the main types of circulating assets in their total amount is considered [16].
- c). The turnover of certain types of current assets and their total amount is studied. This analysis is carried out using indicators - the turnover ratio and the turnover period of current assets. In the process of analysis, the total duration and structure of the operational, production and financial cycles of the enterprise is established; the main factors that determine the duration of these cycles are investigated.
- d). The profitability of current assets will be determined. In the process of analysis, the profitability ratio of current assets is used, as well as the DuPont model, which in relation to this type of assets has the form:

$$P_{oa} = P_{pn} * O_{oa}$$

where  $P_{oa}$  - profitability of current assets;

$P_{pn}$  - profitability of product sales;

$O_{oa}$  - turnover of current assets.

- e). The composition of the main sources of financing of current assets is considered - the dynamics of their amount and share in the total amount of financial resources invested in these assets; the level of financial risk generated by the existing structure of funding sources for current assets is determined.

2. The choice of policy for the formation of current assets of the enterprise. The theory of financial management considers three fundamental approaches to the policy of forming the company's circulating assets - conservative, moderate, aggressive.

A conservative approach to the formation of current assets provides not only full satisfaction of the current need in all their types, which ensures the normal course of operating activities, but also the creation of high amounts of their reserves in case of unforeseen difficulties. This approach guarantees minimization of commercial and financial risks, but negatively affects the efficiency of using current assets - their turnover and the level of profitability [3].



A moderate approach to the formation of circulating assets is aimed at ensuring full satisfaction of the current need in all their types. This approach provides an average ratio between the level of risk and the level of efficiency of using current assets [7].

An aggressive approach to the formation of current assets is to minimize all forms of insurance reserves for certain types of these assets. In the absence of disruptions in the course of operating activities, this approach to the formation of current assets provides the highest level of efficiency in their use.

3. Optimization of the volume of current assets. The optimization process for this volume consists of 3 stages.

- a) Based on the results of the analysis of current assets, a system of measures is determined for the implementation of reserves aimed at reducing the duration of the operational, and within its framework, the production and financial cycles of the enterprise.
- b) Based on the selected type of policy and the disclosed reserves for reducing the duration of the operating cycle, the volume and level of certain types of these assets are optimized. The means of such optimization is the regulation of the period of their turnover and the amount.
- c). The total volume of the company's current assets for the coming period is determined:

$$TV_n = S_n + SF_n + A_{an} + D_{ap} + P_n$$

where  $TV_n$  - the total volume of current assets of the enterprise at the end of the period;

$S_n$  - the sum of stocks of raw materials and materials at the end of the period;

$SF_n$  - the sum of stocks of finished products at the end of the coming period (including the recalculated volume of work in progress);

$A_{an}$  - the amount of accounts receivable at the end of the period;

$D_{ap}$  - the amount of monetary assets at the end of the period;

$P_n$  - the sum of other types of current assets at the end of the period.

4. Optimization of the ratio of constant and variable parts of current assets. In the process of managing current assets, their seasonal (or other cyclical) component should be determined, which is the difference between the maximum and minimum demand for them throughout the year.

The process of optimizing the ratio of the constant and variable parts of current assets is carried out in the following stages:

- a) Based on the results of the analysis of the monthly dynamics of the level of current assets in days of turnover or in total for a number of previous years, a graph of their average "seasonal wave" is plotted in the context of months of the year.
- b) According to the results of the "seasonal wave" schedule, the coefficients of unevenness (minimum and maximum levels) of current assets in relation to their average level are calculated.
- c) The sum of the constant part of current assets is determined according to the following formula:

$$OA_{\text{post}} = \overline{OAn} * C_{\text{min}}$$

where  $OA_{\text{post}}$  is the sum of the constant part of current assets in the coming period;

$\overline{OAn}$  - the average amount of current assets of the enterprise in the considered forthcoming period;

$C_{\text{min}}$  is the coefficient of the minimum level of current assets.

d) The maximum and average amount of the variable part of current assets in the coming period is determined.

These calculations are carried out according to the following formulas:

$$OA_{\text{max}} = \overline{OAn} * (C_{\text{max}} - C_{\text{min}})$$

$$OA_{\text{avari}} = ((\overline{OAn} * (C_{\text{max}} - C_{\text{min}})) / 2) = (OA_{\text{max}} - OA_{\text{const}}) / 2$$

where  $OA_{\text{max}}$  is the maximum amount of the variable part of current assets in the coming period;

$OA_{\text{avari}}$  - the average amount of the variable part of current assets in the coming period;

$OA_{\text{const}}$  - the sum of the constant part of current assets in the coming period;

$C_{\text{max}}$  - coefficient of the maximum level of current assets;

$C_{\text{min}}$  - coefficient of the minimum level of current assets.

5. Ensuring the necessary liquidity of current assets. For these purposes, taking into account the volume and schedule of the upcoming payment turnover, the share of current assets in the form of cash, highly and medium liquid assets should be determined.

6. Ensuring the required profitability of current assets. Like any type of assets, current assets generate a certain profit when used in the operating activities of an enterprise. An integral part of current asset management is to

ensure the timely use of the temporarily free balance of monetary assets to form an effective portfolio of short-term financial investments in the form of their equivalents.

7. The choice of forms and sources of financing of current assets. This stage of the management of circulating assets ensures the choice of a policy for their financing at the enterprise and optimization of the structure of its sources. In the process of managing circulating assets at the enterprise, separate financial standards are developed, which are used to control the effectiveness of their formation and functioning.

## Results

Working capital management policy should ensure that a compromise is found between the risk of liquidity loss and operational efficiency. It boils down to solving two important problems.

1. Ensuring solvency.
2. Ensuring an acceptable volume, structure and profitability of assets.

The purposes and nature of the use of certain types of current assets have significant distinctive features. Therefore, at enterprises with a large volume of circulating assets used, their management is detailed in the context of their main types (Implementation of a management system).

Consider the features of management of certain types of current assets of the enterprise.

### *Inventory management.*

Effective management of inventories allows to reduce the duration of the production and the entire operating cycle, reduce the level of current storage costs, reduce the level of transaction costs for their purchase, free up part of the financial resources from the current economic turnover by reinvesting them in other assets.

The most important element of the analysis of stocks is the assessment of their turnover. The main indicator is the circulation time in days. The acceleration of turnover is accompanied by additional involvement of funds in turnover, and the slowdown is accompanied by the diversion of funds from the economic turnover.

Among the systems of control over the movement of stocks in countries with developed economies, the most widely used is the "System ABC". The essence of this controlling system consists in dividing the entire aggregate of inventories into three categories based on their value, volume and frequency of expenditure, negative consequences of their shortage for the course of operating activities and financial results, etc [17].

### *Accounts receivable management.*

Current accounts receivable is understood as a debt of legal entities and individuals of certain amounts of cash and cash equivalents to the enterprise, which arises in the course of a normal operating cycle or is due for maturity in a period of up to one year.

Formation of algorithms for managing current accounts receivable is carried out in the following main stages:

1. Analysis of the current receivables of the company in the previous period. The main task of this analysis is to assess the level and composition of the company's current receivables in the context of commodity (commercial) and consumer loans.
2. Choice of the type of credit policy of the enterprise in relation to the buyers of products. In the process of forming the principles of credit policy in relation to buyers of products, two main issues are resolved:
  - a) in what forms to sell products on credit;
  - b) what type of credit policy should be chosen by the company for each form of selling products on credit.
3. Determination of the possible amount of working capital sent to accounts receivable for commodity and consumer loans.
4. Formation of a system of credit conditions. These conditions include the following elements: loan term; the size of the loan provided; the cost of providing a loan; a system of penalties for late fulfillment of obligations by buyers.
5. Formation of standards for assessing buyers and differentiation of loan conditions. The establishment of such standards for evaluating buyers is based on their creditworthiness.
6. Formation of the procedure for the collection of current receivables. This procedure should include: terms and forms of preliminary and subsequent reminders to buyers about the date of payments; conditions for initiating bankruptcy proceedings against insolvent debtors.
7. Ensuring the use of modern forms of refinancing of current receivables at the enterprise. Refinancing - accelerated transition to other forms of current assets of the enterprise: cash and highly liquid short-term securities.

8. Construction of effective control systems for the movement and timely collection of current receivables. Such control is organized within the framework of building a general system of financial control at an enterprise as an independent unit. One of the types of such systems is the "ABC System" in relation to the portfolio of the company's accounts receivable [13].

#### *Cash asset management.*

The management of cash assets or the balance of cash and cash equivalents constantly at the disposal of the enterprise is an integral part of the general management of current assets. The size of the balance of monetary assets that the enterprise operates in the course of economic activity determines the level of its absolute solvency (the company's readiness to immediately pay off all its urgent financial obligations), affects the amount of capital invested in current assets, and also characterizes to a certain extent its investment opportunities (the investment potential of the enterprise making short-term financial investments).

The main goal of financial management in the process of managing monetary assets is to ensure the constant solvency of the enterprise.

Along with this main goal, an important task of financial management in the process of managing monetary assets is to ensure the effective use of temporarily free funds, as well as the formed investment balance [1].

When implementing this management, it should be borne in mind that the requirements for ensuring the constant solvency of the enterprise determine the need to create a high amount of monetary assets, i.e. pursue the goal of maximizing their average balance within the financial capabilities of the enterprise. On the other hand, the monetary assets of an enterprise in national currency during their storage are largely subject to the loss of real value from inflation; in addition, monetary assets in national and foreign currencies during storage lose their value over time, which determines the need to minimize their average balance.

## **Discussion**

The management of financing the current assets of the enterprise is subordinated to the goals of ensuring the necessary need for them with appropriate financial resources and optimizing the structure of sources for the formation of these resources. With this goal in mind, the management of financing the company's current assets is being built [15; 11].

1. Analysis of the state of financing of current assets of the enterprise in the previous period. The main purpose of this analysis is to assess the level of sufficiency of financial resources invested in current assets, as well as the degree of effectiveness of the formation of the structure of sources of financing from the standpoint of the impact on the financial stability of the enterprise.
2. The choice of the policy of financing the current assets of the enterprise. This policy is intended to reflect the general philosophy of financial management of the enterprise from the standpoint of an acceptable ratio of the level of profitability and risk of financial activities, as well as correspond with the previously considered policy of forming current assets [6].
3. Optimization of the volume of current financing of current assets (current financial needs), taking into account the formed financial cycle of the enterprise. Such optimization makes it possible to identify and minimize the real need of an enterprise for financing current assets at the expense of equity capital and attracted financial credit (in its long-term and short-term forms).
4. Optimization of the structure of sources of financing of the company's current assets. When determining the structure of this financing, the following groups of sources are distinguished:
  - equity capital of the enterprise;
  - long-term financial loan;
  - short-term financial loan;
  - commodity (commercial) credit;
  - the minimum amount of current settlement obligations [2].

So, working capital is one of the constituent parts of the property of the enterprise. The state and efficiency of their use is one of the main conditions for the successful operation of the enterprise. The development of market relations determines new conditions for their organization. High inflation, non-payments and other crisis phenomena force the company to change its policy in relation to working capital, look for new sources of replenishment, study the problem of their efficiency.

## Conclusion

Working capital management is important in solving the key problem of the financial condition: achieving an optimal balance between the growth of production profitability (maximizing the return on invested capital) and ensuring stable solvency, which serves as an external manifestation of the financial stability of the enterprise. An extremely important task is also the provision of stocks and costs of the enterprise with the sources of their formation and the maintenance of a rational ratio between own working capital and borrowed resources aimed at replenishing working capital.

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# THE INTERRELATION OF DIGITAL TECHNOLOGIES AND ORGANIZATIONAL AND ECONOMIC MECHANISMS IN CONSTRUCTION: ADAPTATION TO CHANGE MANAGEMENT

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## Abstract

The construction sector is one of the drivers of the world economy. The dynamics of the industry growth indicators over the past few years show a positive impact on countries' general economic indicators with different levels of development. The construction industry's economic and financial success depends on many factors of influence, which can be grouped into internal and external. The development of digital technologies is outpacing the development of the world economy, feeling in recent years where developing countries' stimulating influence. In the period of intensification of the development of the information society and total informatization of the economy, digital technologies significantly impact all sectors of the economy without exception; the construction industry is no exception. However, there are many obstacles to implementing new technologies, changes in the work of construction companies in the innovation direction, in particular the adaptation of organizational and economic mechanisms of construction to increase the impact of digital technologies on their economic systems and construction in general. Respectively, it seems expedient to enhance management by developing and implementing a relevant set of measures at the managerial level. The identified problem areas and the preliminary analysis of causation made it possible to develop a set of management activities to adapt the organizational and economic mechanisms of Ukrainian construction companies to the advance of digital technologies. The proposed approach to building a tree of objectives and their prioritization depending on the timeframe of implementation will create opportunities to enhance construction companies' functioning.

**Keywords:** Construction Industry, Developing Countries, Organizational and Economic Mechanisms In Construction, Digital Technologies, Causal Relationship, Regressive Model, Tree of Objectives

JEL: O10

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## Introduction

In economic systems of different levels, under the conditions of world and national economies transformation, intensification of globalization, construction has been established as a leader and occupies a prominent place as a key driver in economic growth. While defining construction an impetus underlying economic growth, it is also worth emphasizing the role of the industry in national economic chains, the financial success of related industries specifically relies on the construction industry [30]. According to analytical research, construction accounts for up to 10% of GDP in some leading world economies [17]. Empirical research suggests that investing one US dollar in the construction industry stimulates the placement of three additional ones in the country's economy [14]. Moreover, this entails additional employment of four workers for each additional worker hired in the construction industry [1,2]. Numerous studies confirm the significance of developing the construction industry and its value in the overall economic progress at the national level and worldwide. Apart from the mainstream trends, scientists turn the spotlight on the positive forecasts [33; 3], in particular, by 2030 the industry is anticipated to grow by 85% from the baseline of 2018 to 15.5 trillion USD [25-27].

From a perspective of the countries in terms of their economic level, the role of construction is significantly increasing, especially in the post-crisis recovery of their economy [2-7]. In fact, Ukraine can be referred to this type of economy. Provided the development and incremental investment in the construction industry, the emerging economies can obtain the following results and benefits: additional investments from domestic and foreign investors; increase foreign exchange earnings and increase opportunities for more effective monetary policy; reduce barriers to intensifying the development of sectors of the national development economy; to ensure the reduction of unemployment by way of boosting employment opportunities, especially for workers in technical specialties; as well as increasing budget revenues at various levels, businesses and households [22].

An important aspect is that the construction industry is low-tech, that is it is a mature industry where technologies are prone to change very slowly [19]. Enterprises, scientists and government institutes themselves work on improving the efficiency of the industry, emphasizing the key importance of digital technologies [26; 4]. A 2018 survey of construction companies by Turner and Townsend (2018) suggested that digital technologies ranked third among the key drivers of in the industry. An additional argument in favor of digital technologies and their role in the development of the construction industry is that in the framework of the World Economic Forum, digital technologies were included in the three key areas of modern transformation of the construction industry. Highly developed countries have long been focused on enhancing the development and implementation of digital technologies within the construction industry [8; 19].

The above statements can be supported by an increase in the number of modern studies, which are devoted to a detailed study of the features of utilizing digital technologies aimed at improving the efficiency of the construction industry. Probing deeper into the role of integrated digital technologies in construction projects is promising [10-13]. Scientists have substantiated the positive impact of using the digital technologies to enhance the efficiency of the construction projects. Shibeika and Harty (2015) studied the spread of digital technologies in construction taking the example of the British engineering firms, and also pointed out the benefits of this approach to increase the revenues of the companies. Kapogiannis and Mlilo (2019) considered strategies for digital construction and the use of BIM technology in railway tunnels engineering. This abovementioned study exemplified a positive effect by improving the quality of built tunnels, as well as optimizing the budget of such projects [15].

Despite the considerable in-depth and detailed research of the scholars and the apparent positive effect of digital technology, there are still some unresolved issues to be addressed, as well as significant sticking points in their integration and adaptation within the existing and operating in such countries organizational and economic mechanisms where such problems can be identified in Ukraine [23, 24]. As a developing country, the economic policy of Ukraine is focused on enhancing the efficiency within the framework of accelerating the integration processes into the economic space of the European Union, in compliance with the approved foreign policy, Ukraine strives to become a member of the European political and economic community in the near future. Under such circumstances, the construction industry can create groundbreaking prospects for economic development overall [21, 28]. However, the agenda of problems and obstacles along the way also addresses a point regarding the insufficient attention to the significance of advancing the digital technologies. According to the contemporary scholars, this factor keeps at bay the feasibility of the Ukrainian construction industry economic potential [31, 32].

Taking into consideration the arguments above alongside with the substantiation of the topicality of the chosen research topic, its purpose is to determine: drawing on the global trends and statistical indicators of Ukraine, to identify areas for optimizing the management of adjusting the organizational and economic construction mechanisms against the backdrop of the crucial role that digital technologies play currently.

## Materials and Methods

The article considers digital technologies as one of the key elements to ensure the growth of the global construction industry and construction industries of the developing countries, including Ukraine. The study is based on the assumption that construction companies headquartered in the developing countries, including Ukraine, are faced with the need to manage the adaptation of organizational and economic construction mechanisms to leverage the impact of digital technologies on the national economy.

To confirm or reject the hypothesis, the methods of quantitative analysis of statistical data were used, in particular the dynamics and trends of the world construction industry were presented, specifically within the framework of countries with different levels of economic development. A particular emphasis is placed to the analysis, using one-dimensional statistical methods (UI) of the dynamics of the global digital technology market, as well as in terms of the relationship between the digital technology industry and the construction industry in Ukraine. The statistical data for the period of 2009-2018 collected from the official statistical databases [18] were used for analysis conducted. One-dimensional statistical methods rely on a sample of data for analysis.

The article draws heavily on the method of correlation-regression analysis, namely the linear regression model, as well as statistical verification of the obtained model by calculating the pairwise correlation coefficient, the coefficient of determination and the Chaddock scale. These methods were used to study the impact of digital technology uptake in Ukraine on the growth of the construction industry.

Regression analysis involved identifying the relationship between a dependent variable and one or more independent variables. Hence, a dependence model was hypothetically built, and the obtained estimates of parameter values were used to develop an evaluative regression equation. Then, a number of varied tests were used to find out whether the model is satisfactory. If the model is held satisfactory, the evaluative regression equation can be used to predict the value of the dependent variable for given values of independent variables.

In simple linear regression, the model used to describe the relationship between a single dependent variable and a single independent variable  $x$  is as follows:

$$y = a_0 + a_1x + k \quad (1)$$

$a_0$  and  $a_1$  – parameters of the model

The model parameters in this case are the probability error term that explains the variability  $y$ , which cannot be explained by a linear relationship with  $x$ . If the error term was absent, the model would be deterministic; in which case, the value of  $x$  would be sufficient to determine the value of  $y$ .

Each regressive model is to be tested for adequacy, that is for compliance with the results obtained. One of the indicators is  $R^2$  – a determination coefficient. As a rule, this coefficient is within the range from 0 to 1. The principle “the higher the value, the better” does not work with this coefficient. Instead, if the value of the coefficient approaches to 1, it may indicate a mismatch of the constructed regressive model. This correspondence may be due primarily to inconsistencies in the data and the obvious relationship between the variables, or the presence of a component that distorts the results.

The use of  $R^2$  as an indicator of model validity entails certain disadvantages. That said, in case the value tends to be low, it can be improved by affecting additional parameters to the model that could potentially affect the dependent variable. This shortcoming can be eliminated by performing additional testing of statistical significance using the F-test or using an adjusted determination coefficient, namely  $AR^2$ .

Overall, the research methodology is based on system-functional, historical and systemic approaches in revealing and solving the problem of improving the management of adaptation of organizational and economic mechanisms of construction to boost the impact of digital technologies on the national economy. This approach made it possible to reveal the impact of digital technologies on the development of the construction industry. Apart from that, a historical approach was used to assess the dynamics of world GDP, the global construction industry, the construction industries of developing countries (Ukraine included), the global digital technology market, digital technology markets in developing countries (Ukraine included).

## Results

Over the past few decades, the construction industry has taken a key place among those that are actively developing and significantly influencing the countries' economic development. This statement can be exemplified by the following statistics and trends:

- for the period 2009-2018 there was a positive trend in the growth of the construction industry share in world GDP, despite the financial and economic crises and political instability. In total, in this time range, growth comprised 8 trillion USD (335.3% as compared to 2009);

- of note is also the development dynamics of the construction industry in the period 2009-2014. The period of the global economic crisis in 2009 was characterized by the falling dynamics of basic economic indicators, but the share of construction in world GDP was gaining, so this industry can be considered the driving force of economic systems. In the next few years, the organic growth of the industry had a positive impact on the balance of economic development in the post-crisis period and a driver of pre-crisis growth recovery.

The impact of construction in the national income and economic growth of countries is significant, and the problems that arise in the industry may pose a risk of future imbalances in the economic system and increase the probability of the financial and economic crisis to follow. Thus, it is feasible to monitor and analyze the impact of construction development on the global construction industry (Figure 1).

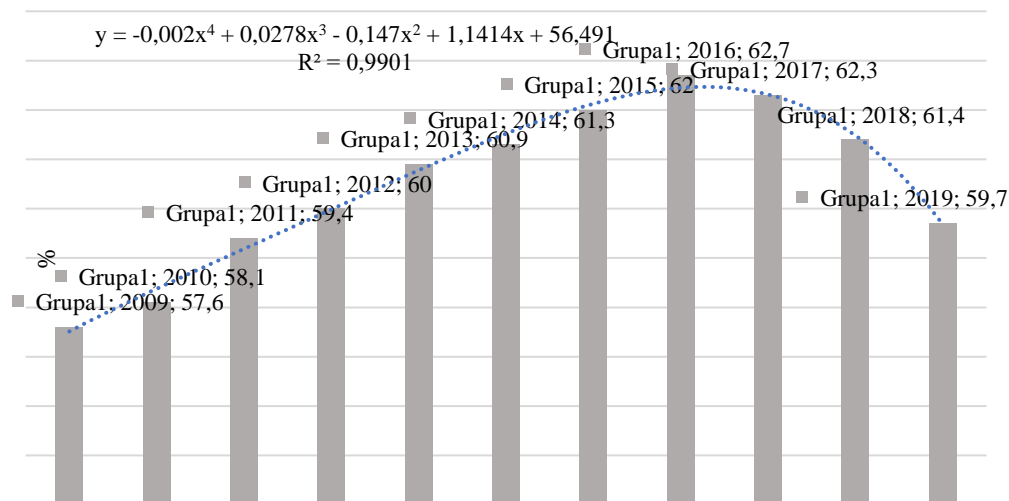


Figure 1. The share of construction in the total volume of world construction industry in 2009-2019: the developing countries

\* - Drafted by the author based on sources: [18]

The analysis carried out on the example of developing countries revealed the following trends and features of the relationship between the development of the construction industry and economic growth. In particular, the statistics presented points to a significant impact of the construction industry on economic dynamics in a number of the developing countries. Among the leaders in the world construction industry is China due to a key share. That being the case, India, the UAE, Mexico, Turkey, Taiwan, Peru, Brazil, and Chile are among the developed and highly developed countries.

The evaluation of global trends does not make it possible to identify to a full extent the defining problems, the influencing factors and possible consequences of changes in the dynamics of the construction industry. In this perspective, it is considered feasible to conduct a systemic analysis of development indicators of the construction industry on the example of a developing country (Figure 2).



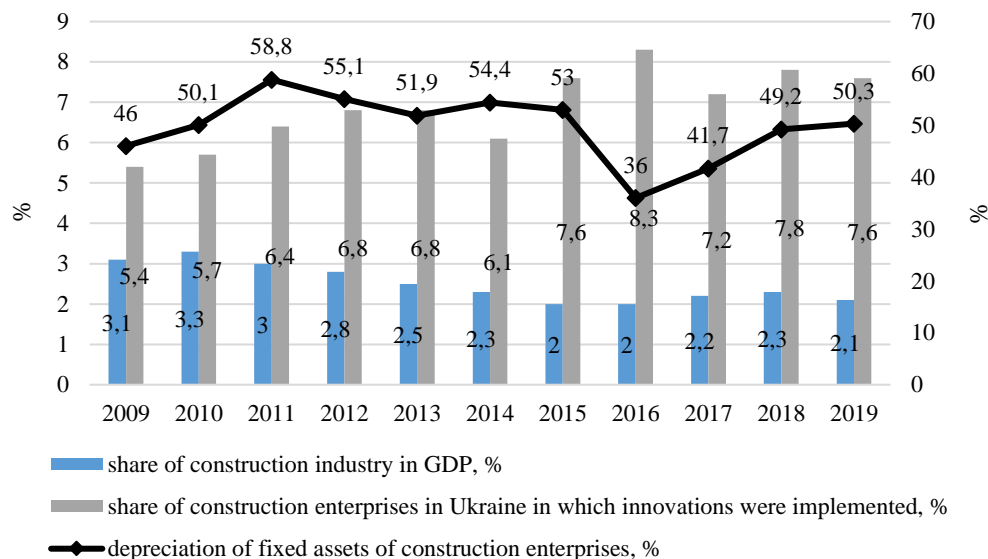


Figure 2. Development of the construction industry in Ukraine in 2009-2019: major indicators

\*- Drafted by the author based on sources [17-18]

The share of the construction industry in the country's GDP does not show the distinct dynamics, which is primarily due to the impact of domestic (an unbalanced economic system, a low impact of reforms, political tensions and the impact of the political factor, dependence on imports) and external factors (the world crisis of 2009, the fall of the world economy, a sharp decline in industrial development). Overall, the share of the industry in GDP indicates that construction is not a major and profitable sector of the economy. The key trends were as follows: 2009-2010 – growth (+ 0.2%); 2011-2016 – decrease (-1.3%); 2017-2018 – growth (+0.3%). Despite the economic incentives on part of the government, as well as the implementation of investment and innovation projects at the state level, in 2018 (2.3% of GDP) failed to reach the pre-crisis level (3.3% of GDP).

The non-prioritized status of the construction industry is enhanced by the statistics on the percentage of depreciation of fixed assets, which is a constraint on the development of the industry and an obstacle to the implementation of the potential to a full extent. Overall, the dynamics of fixed assets depreciation indicates a critical situation, as the percentage of depreciation ranges around 50%. That said, an insignificant improvement over the period of 2016-2017 was the result of the enterprises' bankruptcy with the most depreciated fixed assets; with artificial reduction of depreciation due to the revaluation of obsolete and worn-out fixed assets. Therefore, there is every reason to suppose that during the study period, the renewal of fixed assets virtually did not take place.

A considerable lever of influence for the construction industry growth, which at the same time has a positive impact on increasing the importance of economic development is the focus on innovation and breakthrough activity in general. The small share of enterprises advancing the innovations indicates a critically low attention to innovation on the part of construction companies. This is primarily due to the lack of insights on part of the management of enterprises as for the importance of innovations in construction; the lack of financial resources for the development, purchase and advancement of innovations in economic activity; the low interest of employees in the development and implementation of innovations; the reluctance of employees to innovate and restructure the conventional work flow.

The qualitative and quantitative indicators of the construction industry evolution in Ukraine indicate the presence of a range of significant problems that hinder a robust development. To conduct a systemic analysis of the problems and their gradation according to the criteria of direction and severity of impact, a comparative assessment is presented (Table 1). The targets were Ukraine and other developing countries taken together as a group. The ranking was performed on a 10-point scale by evaluating the systematized problems, where 0 (absent) – 10 (the most critical).

Table 1. Comparative characteristics of determining the negative impact factors on enhancing the construction in Ukraine and other developing countries

Problems	Developing countries	Rank of the problem	Ukraine	Rank of the problem
Elevating the construction costs	yes	7	yes	6
Possibility to attract credit resources	yes	5	yes	7
The cost of credit resources	yes	7	yes	9
Quality of state regulation	yes	6	yes	7
Solvent demand	yes	7	yes	7
Availability of infrastructure	yes	7	yes	6
Technologies	yes	6	yes	5
Shadow market	yes	6	yes	9
Staff shortage	no	-	yes	8
Staff training	yes	7	yes	5
Low productivity growth	yes	7	yes	6
Innovations	yes	9	yes	9
Digital technologies	yes	10	yes	10
Quality of construction	yes	8	yes	6

Source: drafted by the author

The conducted comparative analysis allowed to discern the factors, the impact of which is the most crucial. Namely, these are as follows: underdeveloped digital technologies; low level of innovation, unsatisfactory quality of construction due to the use of low quality materials. The shadow sector is additionally singled out for Ukraine, which basically distorts market mechanisms and creates preconditions for deepening unfair competition. Instead, in highly developed countries, the uptake of digital technologies and the introduction of innovations is a priority and determines the dynamics of the construction industry (Figure 3).

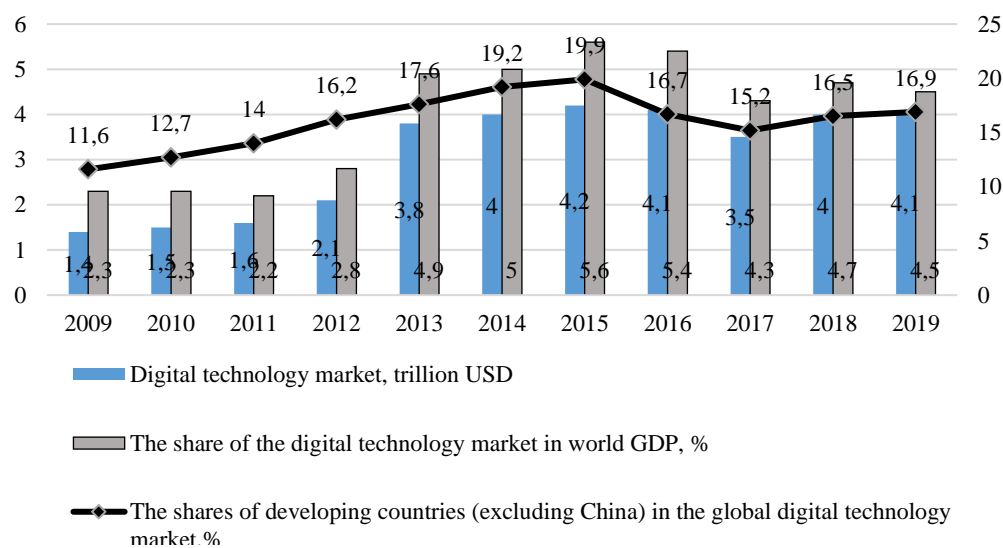


Figure 3 Dynamics of indicators of the digital technology industry uptake worldwide in 2009-2019.

\* Drafted by the author based on sources: [17-20]

During the period 2009-2018, the digital technology market developed intensively, as a result of which its share in world GDP increased from 2.3% in 2009 to 4.7% in 2018. Still, there is a distinct tendency to deepen the problems. in 2016-2017 and the gradual recovery of positive dynamics in 2018. Analysis of the share of the digital technology market in Ukraine's GDP showed (Figure 4) that the digital technology market in Ukraine in general indicates a gradual development, even in periods of two consecutive financial and economic crises, but also about the lag of the global indicator.

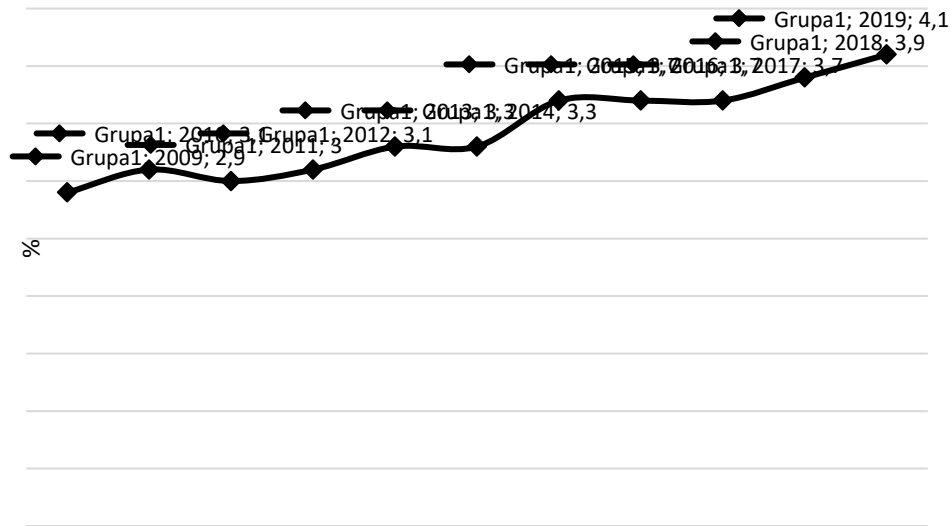


Figure 4. The change in the market share of digital technologies in the GDP of Ukraine in 2009-2019.

\* - Drafted by the author based on sources: [17-20]

Despite the consistent and positive advance of digital technologies in Ukraine, the following issues remain unresolved (Figure 5).

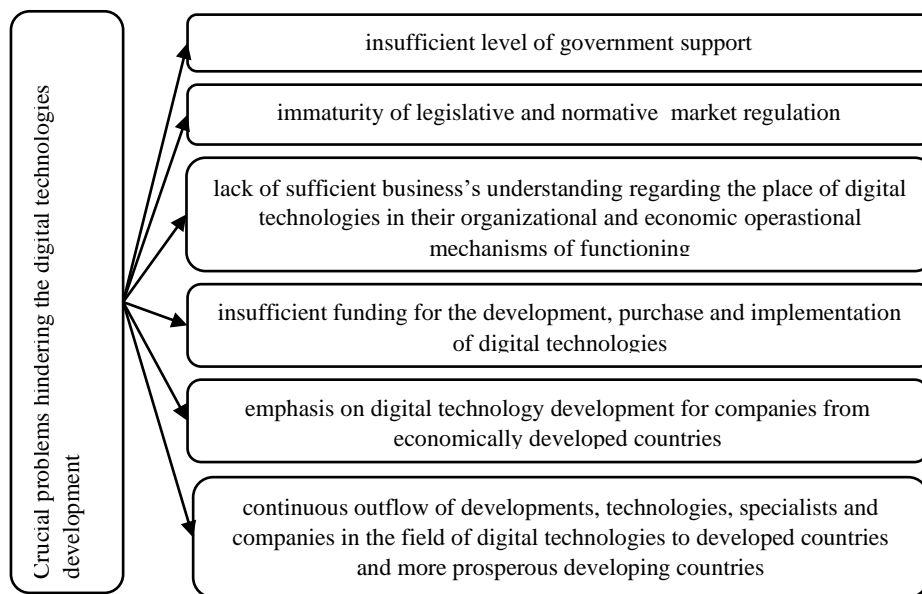


Figure 5. Systematization of problems of digital technologies development in Ukraine

\* - Drafted by the author based on sources

The role of digital technologies in the development of the construction industry is substantiated with due regard to their use for information modeling of the premises, reducing shortcomings in design and construction management, enhancing the efficiency of working time, improving the quality of communication between employees, buildings design, quality assurance in security management. This range of intersections is not limited to the items listed, the whole process depends on the specific technology and the readiness of the enterprise to implement them.

To check the hypothesis regarding the relationship between the construction industry and the digital technology industry, a model based on correlation-regressive analysis is proposed. Thus, a linear regression model is designed. The statistical indicators for the period 2009-2018 are selected as the initial data for the research, namely: the size of the construction industry and the cost of using digital technologies in construction (Table 2).

Table 2. The initial data for correlational-regressive analysis

Years	The size of the construction industry	The cost of using digital technologies in construction
2009	34123	990
2010	35366	1096
2011	39575	1187
2012	39049	1211
2013	36902	1218
2014	36876	1217
2015	38928	1440
2016	47457	1756
2017	64431	2384
2018	82924	3234
2019	83291	3516

\* - Drafted by the author based on sources: [4-8]

The statistical verification of the obtained model was also performed by estimating the pairwise correlation coefficient, the coefficient of determination and the Chaddock scale. The following regression equation was obtained using the built-in function of Microsoft Excel tools:

$$y = 26781x + 29780, \quad (1)$$

where  $y$  – size of the construction industry in Ukraine, UAH million,  $x$  – costs for use in the construction of digital technologies, UAH million

Each of the models designed requires statistical verification, in particular to determine the significance of the obtained results. The presented model is characterized by the following indicators (Table 3):

1. By comparing the estimated correlation coefficient ( $r_{est}$ ) with the critical correlation coefficient ( $r_{crit}$ ), which will be taken in the table taking into account  $\alpha = 0,05$  and  $f = 9$ .
2. By calculating the coefficient of determination  $R^2$  and estimating its approximation to 1.

Table 3. The statistical verification of the designed regressive model

Factor	$r_{est}$	$\alpha$	$f$	$r_{crit}$	Ratio $r_{est}$ and $r_{crit}$	$R^2$
Costs for use in construction of digital technologies	0,993	0,05	9	0,602	>	0,986

Source: drafted by the author

According to the results of the study, the following conclusions were arrived:

1. The relationship between the indicators is strong and increases over time, which indicates the comparison of the estimated value of the correlation coefficient ( $r_{est}$ ) with the Chaddock scale.
2. The occurrence of the following inequation  $|r_{est} \geq r_{crit}|$  is found. This suggests that the hypothesis of the significance of the linear relationship is not rejected and the indicator can be included in the above model.
3. The determination coefficient  $R^2$  is quite high and close to 1. This indicates a high statistical significance of the results.

Thus, the results of the statistical testing indicate a close linear relationship between the selected indicators, so digital technology is one of the key factors influencing the development of the construction industry in Ukraine.

Digital technologies have one of the key influences on the development of the Ukrainian construction industry but are not perceived as such by business entities in national construction. In view of that, it requires appropriate adaptation of organizational and economic mechanisms of construction companies in Ukraine. The process of adaptation of a construction company to the advance of digital technologies involves management decisions, prior to which there should take place a thorough consideration of this factor in the formation of a strategic plan for enterprise development. If the process of adaptation is considered separately without reference to the strategic plan, so we can present a tree of objectives as follows (Figure 6).

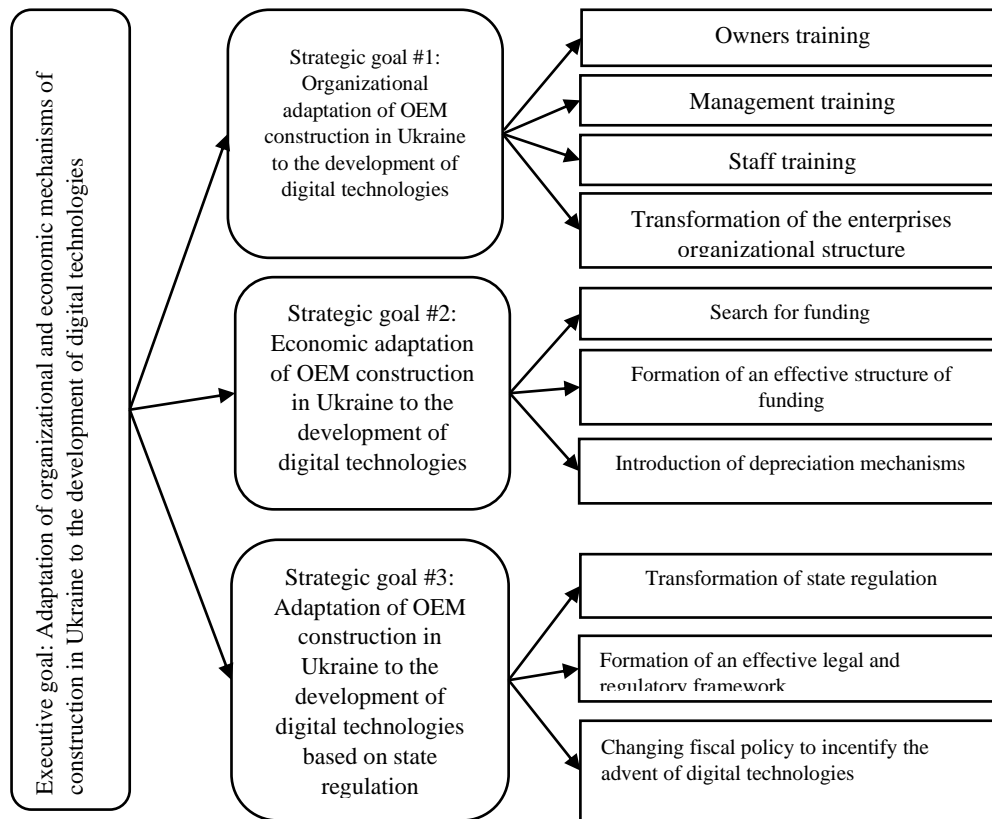


Figure 6. The set of management activities for the adaptation of organizational and economic mechanisms of construction in Ukraine to the development of digital technologies

The following approach was used in the distribution and formation of goals within the executive goal:

The first two goals are addressed and can be achieved through internal management influence on construction companies;

However, the third goal and tactical activities within its framework can be achieved within external management influences on construction companies.

The presented set of construction mechanisms in Ukraine for the development of digital technologies is sufficiently substantiated and previously reconciled with the obtained empirical results. However, this approach has several limitations. First, it is used for the hierarchical organization of activities within the achievement of strategic goals and the executive goal. Second, the management process is not characterized by cyclicity and integrated goals (objectives). The next limiting factor is the synchronization of deadlines, strategic goals and executive goal. It is also worth emphasizing the need for the principle of coherence of the executive goal, strategic goals and tactics activities. As the proposed approach is rather comprehensive, a significant limitation is that it does not take into consideration the financial and economic capabilities of the enterprise, as well as the availability of sufficient human resources to implement strategic goals and to achieve the executive goal. These limitations should be taken into account in the future adaptation of the model to a particular enterprise or other industry. In terms of supporting the process of forming a set of management activities for each specific enterprise, it is also advisable to review the possibilities of linear regression and reconsider the possibility of applying a multifactor model with the inclusion of a wider range of performance indicators. This limitation in the study may serve as a further perspective for expanding the model taking into account the specifics of the industry and the company.

## Discussion

The above analysis is in keeping with the hypothesis regarding the relationship between the development of the construction industry and the intensity of the digital technologies advancement. The regressive analysis method applied is widely used to identify causal inferences and directions of influence between indicators, model parameters [20]. The use of linear regression has certain limitations, in particular the presence of one affected parameter only and one parameter of influence [15]. In terms of achieving a meaningful high level of statistical significance, it is advisable to include several indicators, preliminary using the static tools and to clear the data off seasonality. Should the model be expanded and applied to the construction industry, the elimination of the seasonal

trend is crucial, because in winter the construction dynamics is significantly weakened by weather conditions that do not contribute to construction projects [11, 12].

The proposed approach to comparing and analyzing statistics made it possible to identify trends and identify time periods where the most profound changes were observed. The statistical analysis of the obtained data can be strengthened using not only absolute but also relative indicators [16]. The use of relative indicators in the course of economic-mathematical modeling and construction of a regressive model will have a positive impact on the results [9]. This approach will affect the statistical characteristics of the model and the relevance of the built correlations [8,21].

The hypothesis about the importance of digital technologies in the development of the construction industry can be significantly strengthened by deriving a benchmark among construction companies, in fact by comparing analytical data on their core business and the implementation of digital technologies [1; 4]. Also, the clause regarding the application of the systems approach falls under discussion. The systems approach involves considering any object of study as a system with built-in relationships, and therefore the application of this method already assumes that there is a relationship between variables [26, 34]. That said, the combination of a systems approach and regressive analysis should be substantiated [10].

## Conclusion

The importance of the construction industry in the economic growth of countries with different levels of development is confirmed by the analysis of statistical indicators and correlations built. During the economic crisis that was in effect in 2009-2011, the construction industry became one of the deterrents and an obstacle to a more pronounced decline in macroeconomic indicators. The modern development of the construction industry requires a revision of the policy regarding the advance of innovations and, more importantly, the uptake of digital technologies. The study outlined the trends and issues in construction and digital technologies worldwide, in developing countries and Ukraine. Besides, the regressive analysis pinpointed a close link between the development of the construction industry and the advance of digital technologies.

Drawing on the obtained results and confirmed hypotheses, a set of management activities for the adaptation of organizational and economic mechanisms of Ukrainian construction companies to the advance of digital technologies is presented. The proposed tools include strategic and tactical goals that are consistent with each other and aimed at achieving the executive goal, which entails the adaptation of construction companies to the advance of digital technologies. The effective implementation of such a set of management decisions will enhance the financial performance of enterprises, accelerate the growth of the construction industry in general, as well as create the promising conditions for future upturn.

Furthermore, the presented research is feasible in terms of practical implementation on the example of not only construction companies but also companies in other related industries. Besides, the proposed model of identifying the relationship between different variables (factors of influence) and basic indicators of enterprise functioning can be further elaborated.

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# CORPORATE CULTURE IN STUDENT VIEW IN THE ASPECT OF ORGANIZATION COMPETITIVENESS: PROBLEMS AND DYNAMICS OF FORMATION

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## Abstract

Nowadays, defining criteria of quality of services' rendering, creating a successful situation for employees, and developing its corporate culture will significantly improve incentives. The study aims to study the structure of banking institutions' corporate culture and highlight its elements. As a research method, the questionnaire method was used to determine the most influential corporate culture features in the representation of students working in the banking sector for the organization's competitiveness. The article demonstrates the leading indicators of banking institutions' corporate culture in the students' view and justifies the criteria for its assessment; describes the structure of corporate culture and highlights its elements; defines the technologies for corporate formation culture. The study's novelty and originality lie in the fact that the features of the banking sector's corporate culture in students' representation are studied. For the first time, it is determined that the bank's corporate culture is characterized to a lesser extent as market and adhocracy. To a large extent, it tends clan and hierarchical nature. For the first time, it is revealed that specialists in the banking sector preferred developing the organization's strategy in the direction of an adhocracy culture. It is shown that specialists are least likely to evaluate their organization as dynamic and focused on the growth of indicators and a family-type organization; they would like to see their organization more cohesive, less formalized, and aggressive. It is shown that the head of the banking service should more serve as an example of innovation, take risks, and take responsibility. The data obtained in this work can be used in marketing, economics, social psychology, and labor psychology.

**Keywords:** Corporate Culture, Types of Corporate Culture, Banking Sphere

JEL: L20, M14

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## Introduction

In recent years, Russia has begun to study the problem of organizations' corporate culture actively. Several years ago, almost no one knew the phrase *corporate culture*, which is now so common, although this does not mean that it did not exist before. Each organization as a whole formation has a unique culture [1-5].

Corporate culture exists as a given in any organization with even a short history because it is created by the employees interacting with each other. Because of such interaction, certain traditions, norms, values, and other specific components that characterize the corporate culture are formed [6-8]. For a long time, implementing and managing corporate culture was considered only in business relations. Oil and gas companies have become pioneers in the development of corporate culture in this country. They began to conduct full-scale research on this issue. As for other industries, particularly the banking sector, there has been a trend of positive changes in this direction [9-12].

Thanks to corporate culture formation, employees have a common view of what an organization is and its social and economic role. Corporate culture directly impacts the processes of the specialist's relationship with clients and other specialists. In addition to forming standard views, corporate culture ensures that employees' collective and individual interests are aligned [12-16]. Corporate culture is also important for banking service clients. Along with the quality of services provided, external attributes such as the Bank's interior, nature of communications, technical equipment, etc., are also important. The friendly style of communication and the attitude of banking service specialists to its customers are significant. Customer satisfaction with these indicators has a positive effect on the service's image in the external environment [17-20].

A significant number of authors speak about organizational culture, using the terms *business culture* and *corporate culture* as synonyms for its consideration [21,25]. Thus, corporate culture does not distinguish one banking service from another only and determines the success of the organization and its development in the future.

Corporate culture is manifested in mission, values, and rules, which are officially approved by the institution's management; besides, the organization has norms and rules for employees' informal communication and behavior [25-30].

There are a number of elements in the structure of corporate culture. It should be noted that the division of corporate culture into components is conditional, and there is no developed single point of view to date. Internal elements of corporate culture include traditions, language, rites, rituals, folklore, rules, and ethical standards in relation to colleagues and management. The corporate culture's external elements are based on the mission, credo, symbolism of the institution, and ethical standards concerning customers and other organizations [31-35]. The core of the corporate culture values. They act as a link in the system of elements of the corporate culture. The values included in the structure of consciousness make it possible to ensure the unity of internal and external elements, thereby contributing to the achievement of the service's goals and its successful functioning [21; 34; 16; 9; 10]. For any employee, it is necessary to feel a sense of belonging to the organization, to have motivating factors. Otherwise, if the strategic goals, mission and vision remain unintelligible for the staff, then the effectiveness of professional activity decreases, there is a process of emotional combustion and frustration in the profession [3; 14]. Currently, researchers consider many approaches to the structure of corporate culture and the allocation of its constituent elements. Proponents and authors of each approach are based on different criteria for identifying elements of the organization's corporate culture, and as a result, get different models. The choice of logical criteria that allow structuring the corporate culture of a particular organization is determined both by the practical tasks of the researcher and by the versatility of corporate culture phenomenon. In this regard, the logic of further analysis requires a more detailed consideration of the structure of institutions' corporate culture and the allocation of its constituent elements.

## Materials and Methods

In assessing the corporate culture of banking institutions, there is a need to determine the indicators and criteria for their evaluation. Analysis of the scientific literature has shown that currently, there is no consensus among researchers on this issue. This may be due to two main reasons: firstly, the complexity and ambiguity of the phenomenon of corporate culture, and secondly, the specifics of the banking services' activities themselves.

In this regard, the logic of the study required a more in-depth analysis of the corporate culture's state of this institution. A questionnaire survey was conducted. When preparing the survey, a target sample of respondents from among the banking service specialists was used.

27 specialists took part in the survey. All of them are women currently studying in higher education institutions, of which 53% are between the ages of 20 and 24, and 47% are between the ages of 25 and 35. The specialists involved in the survey have 3 to 10 years of work experience in the organization under study.

To form a broader view of the corporate culture of particular banking service, it is necessary to evaluate a number of other indicators: myths that exist in the banking service can also serve as an indicator of the corporate culture. They play a significant role because they influence the decision-making process in the company. People always filter incoming information, which allows us to quickly calculate the general flow of information; a system of rewards and punishments. What is encouraged and what is punished in a particular service is cultural in nature. One of the most important components of management is the motivation system. The motivation of specialists' professional activity is a multidimensional and dynamic formation, which can be evaluated by the following parameters: professional motivation, material motivation, motivation for self-realization, alternative forms of motivation.

The methodology used allows us to study the following aspects of the banking service's corporate culture: type of social service culture. In this case, the basic assumptions and styles of culture are identified. Knowledge of the cultural type of banking service lies in the fact that any organization's success depends on the extent to which the external environment's culture requirements. Differences between the current corporate culture of the banking service and its preferred state. This makes it possible to see its strengths and weaknesses and outline ways of changes, first, in those areas that significantly interfere with the banking service's effective functioning.

The following tasks were set in the study:

To identify common characteristics of the corporate culture;

To describe the leadership style in the banking service;

To describe the management style;

To identify unifying factors;

To show development strategies;

To examine the criteria for evaluating success in the banking service.

These tasks formed the basis of the questionnaire questions. The questionnaire contains a preamble, the first section, which evaluated the current state of the corporate culture, the second section, which evaluated the preferred state of the corporate culture, and the third section, which dealt with the personal data of the specialist.

## Results

The first question of the questionnaire concerned the main characteristics of the banking sector's corporate culture under study. Respondents were asked to give an overall assessment of the culture of their service. The alternative describing the organization as adhocracy received 13% of answers, the alternative describing the organization in terms of clan culture received on average 16% of answers, the alternative describing a bureaucratic organization received 23% of answers, and the alternative describing a market organization received 48% of answers. Thus, specialists in the banking sector are least likely to evaluate their organization as dynamic and growth-oriented and a family-type organization. In their opinion, the banking sector activities are strictly regulated and limited by formal procedures, as well as largely focused on results and solving production problems. Analyzing the preferred state of corporate culture revealed that the results differ in the upper limits of values. The lowest number of responses (13%) still corresponds to the characteristics of the adhocracy type of culture, which means that this type of culture is the least preferable for the staff. An equal number of responses (21%) were assigned to statements describing the market and bureaucratic types of cultures. The largest number of responses (45%) were given to the clan rather than the market, type of culture. Thus, experts would like to see their organization more cohesive, less formalized, and aggressive. The survey revealed the need to review the existing bureaucratic structure and the desire to solve the tasks at any cost. The second question of the questionnaire concerned leadership style. A significant number of respondents described the style of leadership in the banking sector as tending to family or clan (15%). The largest number of responses (51%) received a bureaucratic leadership style. Thus, a significant number of respondents assess the management's activities as an example of coordination, clear organization, and smooth business management in line with efficiency. The characteristics of the preferred leadership style in the banking sector also differ from those currently available. The statement corresponding to the market type of culture received 21% of responses, and more responses were assigned to the clan and adhocracy types of culture: 41% and 26% points, respectively. The number of points assigned to the statement that characterizes the bureaucratic style of the organization's corporate culture has significantly decreased (12%). Therefore, respondents do not want to change the management style to a more rigid and aggressive one, and they want to see the manager as a mentor and assistant. In their opinion, the head of the banking service should more serve as an example of innovation, take

risks, and take responsibility. Another critical factor in the development of the banking sector's corporate culture is the management style of the organization as a whole. Alternatives to the answers to this question were the following: the management style that characterizes the adhocracy corporate culture scored 15%, the respondents gave an average of 13% to the characteristics corresponding to the market type of culture, and 15% to the clan type. The highest number of responses (57%) was received by the management style characteristic of the bureaucratic type of corporate culture.

According to the data obtained in the course of the study, the leading management style in the banking service is characterized by job occupation guarantees, requirements of subordination, predictability and stability in professional relations. According to respondents, the management style also needs to be revised. Only 18% of respondents rated the currently dominant style. There is an obvious need to increase the share of individual risk, introduce innovations into the service's activities, encourage achievements among specialists, and increase leadership positions in the industry. In other words, there is a need to introduce elements of adhocracy and market elements into the existing corporate culture. However, according to the service employees, it is necessary to preserve the traditions of collective work that have developed in the banking service under consideration, the atmosphere of unanimity and trust, and the ability of team members to take part in solving the most important problems. The contradictions between the existing and preferred types of corporate culture in the studied banking service are also obvious when analyzing the answers to the question about the organization's unifying factors. The lowest number of responses (4%) received a judgment according to which the organization is tied together by the emphasis on achieving the goal and completing the tasks set. According to experts, winning at any cost is not the goal of the banking service. Innovation and leadership in the industry are not the leading unification factors; this alternative received only 16% of responses. A high rating (34%) was given to the judgment according to which the studied organization is united by a dedication to social assistance and support and mutual trust. Finally, the highest rating (63%) was given to the alternative, according to which formal rules and official policies link the organization. Thus, when assessing the existing type of corporate culture of the banking service, one can conclude that the unifying factors for this organization to a lesser extent characterize it as market and adhocracy, and to a large extent as tending to clan and hierarchical.

Meanwhile, the majority of respondents believe that the leading factors for combining the studied banking service should be mutual assistance and mutual support (41%), achieving goals and completing tasks (31%), innovation, and joint victories (35%). In addition, such factors as formal rules and official policies remain significant, although less preferable from the point of view of introducing them into the corporate culture of the banking service (23%). The next question of the questionnaire was devoted to the analysis of the development strategy of the banking service. The largest number of responses (57%) was received by the alternative, according to which the organization's strategy is to develop humanely, support openness and participation. A comparative analysis of the current and preferred state of corporate culture allows us to state that respondents preferred developing the organization's strategy in the direction of an adhocracy culture (51%). Perhaps this is due to current trends in the development of the banking sector when changing and adapting to new conditions and realities quickly is of great importance for the organization.

As for the indicator that characterizes the market type of corporate culture, respondents consider it necessary to increase its manifestation. The final question of the questionnaire was to identify criteria for evaluating success in the organization. The hierarchical type of corporate culture came out on top (53%). However, the clan type of corporate culture is noted as the preferred one. Thus, according to respondents, the existing criteria for assessing success (profitability, high quality of service at the lowest cost, etc.) need to be revised. This is because the system of assessing success within the hierarchical type of culture considers personnel to achieve the goal and does not pay attention to the potential available in the workforce team. According to respondents, the following criteria should be used as the leading criteria for success in the banking service under study: the quality of human resources, participation in collective work, and passion for business, care, and protection of employees.

When forming a banking institution's corporate culture, it is necessary to take into account that any change is always a long process; for the organization to change, people must change. It takes much time to change the corporate culture radically. According to the estimates of corporate culture consultants, the period in which an organization can achieve visible results is from seven to ten years. All activities carried out by the management of the banking service should form a sense of pride, demand, and desire to work among specialists.

## Discussion

For the head of the banking service, corporate culture opens up management prospects through norms and values, opportunities for rapid decision-making, define criteria for evaluating the effectiveness of social service functioning, and facilitates understanding of the workforce's processes.

Corporate culture has a powerful impact on its bearers, transforming their behavior following the requirements of the specialist's profession and its ethical standards. In other words, corporate culture helps employees relate their own goals to

the goals of the organization, strengthen organizational cohesion and create consistency in behavior. In general, culture, more than anything else, encourages responsibility and recognizes creative and effective employees' merits.

However, at present, most managers of institutions have no idea about corporate culture's phenomenon, are not sufficiently aware of its specifics and the possibilities of using corporate culture to improve the efficiency of the functioning of their subordinate institutions.

The corporate culture's external elements are based on the mission, credo, symbolism of the institution, and ethical standards concerning customers and other organizations. The link for these elements is a practical matter.

## Conclusion

When analyzing corporate culture's preferred state, it is determined that specialists would like to see their organization more cohesive, less formalized, and aggressive. The need to review the existing bureaucratic framework and the desire to solve the tasks at any cost is revealed.

Specialists in the banking sector are least likely to evaluate their organization as dynamic and growth-oriented and a family-type organization. The banking sector activities are strictly regulated and limited by formal procedures, as well as primarily focused on results and solving production problems.

The head of the banking service should serve more as an example of innovation, take risks, and take responsibility.

The leading management style in the banking service is characterized by job security, subordination requirements, predictability, and stability in professional relations. It is necessary to increase the share of individual risk, introduce innovations into the service's activities, encourage achievements among specialists, and increase leadership positions in the industry. Specialists have a need to introduce elements of adhocracy and market elements into the existing corporate culture. However, according to the service employees, it is necessary to preserve the traditions of collective work that have developed in the banking service under consideration, the atmosphere of unanimity and trust, and the ability of team members to take part in solving the most important problems.

Formal rules and official policies bind the organization. When assessing the existing type of corporate culture of the banking service, one can conclude that the unifying factors for this organization to a lesser extent characterize it as market and adhocracy, and to a large extent as tending to clan and hierarchical one.

Experts preferred the development of the organization's strategy in the direction of an adhocracy culture. Perhaps this is due to current trends in the development of the banking sector when changing and adapting to new conditions and realities is of great importance for the organization.

As the leading criteria for success in the banking service, it is necessary to apply the following: the quality of human resources, participation in collective work, passion for business, care, and employee protection.

The results obtained in the course of the study determined the choice of technologies within each type that can be used to form a corporate culture.

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## ORGANIZATIONAL AND METHODOLOGICAL SUPPORT OF THE PROCESS OF FORMATION OF OPTIMAL PRE-START STATE IN MARTIAL ARTISTS

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### Abstract

The relevance of the presented topic is stipulated by the fact that currently an important condition for increasing the efficiency of training process and competitive activity in all sports, including martial arts, is the development and implementation of technologies to optimize these processes. A special influence on the efficiency of competitive activity of an athlete is his state before and during the bout. For all the multifaceted dynamics of mental states in sports activities, there are three main types of situations in which psychoregulation is used: correction of deterioration of health, reduction of activity caused by increasing fatigue at the end of the day, removal of excessive mental tension, expressed in increased anxiety, aggression, overcoming frustration. This paper examines the peculiarities of the manifestation of mental states in athletes specializing in karate and proposes means to achieve an optimal pre-start state. The theoretical analysis of literary sources on the problem of research has revealed the fact that there are not so many works devoted to this problem and they concern mostly athletes of high level of sportsmanship. In this regard, all the above allows us to consider the chosen topic of relevance in terms of developing organizational and methodological support for the formation of an optimal pre-start condition in martial artists (by the example of karate). The aim of this study is to formulate the organizational and methodological support of the process of formation of optimum pre-start state in martial artists (on the example of karate). Conducted research allowed to concretize general theoretical ideas about ways, methods, and peculiarities of the process of psychological preparation of sportsmen, the results became the basis for the development of organizational-methodical support of the process of formation of optimum pre-start condition of martial artists. The developed organizational and methodological support of the process of formation of optimum pre-start state in martial artists (by the example of karate) can be applied in institutions of sports orientation.

**Keywords:** Pre-Start States, Combat Readiness, Karate

JEL: Z20

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## Introduction

In sport, as in any strenuous activity, the greatest effectiveness is possible only when the athlete reaches a certain level of mental state and precisely at the right time.

A special place in psychological research is given to sports performance.

It is known that states can have both positive and negative effects on an athlete's performance since sporting activities are high-stress activities. Causes leading to the emergence and development of a condition may be manifold in sporting activities. The presence of a cause, however, does not mean that the condition caused by it has already occurred, as functional systems are resistant to the action of internal and external factors. It should be noted that the same cause (e.g., monotonous training), can cause different, sometimes opposite, states. Athletes' different reactions to the same factor are since these factors induce states indirectly, refracting through the characteristics of the individual and personality [4].

In other words: "state as a holistic adaptive reaction, which includes various components of mental regulation of activity. However, the essence of states and the mechanisms of their development have not been sufficiently studied so far. Therefore, it is necessary to dwell on the main characteristics of states that appear in the process of sports activities and affect performance" [23].

In addition to personality traits, the determining role in the emergence of states in the presence of the same cause is played by the situation in which the athlete is [17].

Emotional states of the athlete are characterised not only during the sport competition itself, but also before it begins [1].

The following four types of these states are distinguished. Starting fever. Its characteristics are: 1) strong excitement, sometimes overwhelming and disorganizing the activity of the athlete; 2) instability of emotions, rapid replacement of one by another, opposite; 3) disorder of attention, distraction, inability to concentrate, to be "collected" to the upcoming responsible actions; 4) weakening of memory - in the state of starting fever the athlete often forgets many important points to be considered in the upcoming competition.

Fever is physiologically related to an excessive increase of excitatory processes in the cerebral cortex with a simultaneous weakening of inhibitory processes. It is expressed outwardly in sharp increase of respiration and pulse rate, as well as in sudden appearance of trembling of hands, legs, coldness of extremities, sweating, increased diuresis, etc., which is explained by weakening of the regulatory activity of the cortex in relation to the vegetative nervous system and subcortical processes [23].

Starter apathy. It is the opposite state to that of startle fever. Its characteristic features are: 1) reduced excitability, expressed in sluggishness of all mental processes and sometimes even drowsiness; 2) lack of desire to participate in the competition; 3) asthenic mood, accompanied by loss of strength; 4) weakened intensity of perception and attention processes.

Physiologically, the state of pre-start apathy is associated with a decrease in excitatory and an increase in inhibitory processes (protective inhibition) in the cerebral cortex as a result, mainly, of overexertion or overtraining. Often, however, the protective inhibition has a psychogenic character and is caused by complex conditioned reflex cortical processes connected with the reflection of unfavorable sides of the forthcoming competition in the sportsman's consciousness [23].

State of combat readiness. This state is characterized by the following features: 1) concentration of attention on the upcoming competition, increased attention span; 2) aggravation of perception and thinking processes; 3) stenotic emotions contributing to successful participation in the competition.

Physiologically, the state of readiness is associated with the nervous excitement optimal for solving the forthcoming competition tasks balanced by the corresponding processes of inhibition. This state is due to the optimal fluidity of the nervous processes in the cerebral cortex [7; 8].

## Methodological Framework

The methodological positions of the study were determined on the basis of the fundamental provisions of domestic sport psychology, as well as studies of scientists dealing with the problem of the formation of the optimal pre-start state.

Most of the works of sport psychologists related to the problem of mental states are devoted to the issue of athlete's pre-start states [19; 11; 20; 23; 7; 8].

Another psychological aspect of sports training is the state of mental readiness, expressed as a state of optimal excitation of mental and physical forces of the athlete and contributing to his maximum readiness for the conditions of competitive activity [20; 19; 21; 2].

A significant number of works are devoted to various means of psychological preparation of athletes for the conditions of training and competition activity, as well as the process of preparation of future coaches for professional activity [13; 15; 18; 27; 28; Kozikova, 2016; 16; 12; 22; Suvorova, 2020; Dunayeva, 2020; 5; 24].

Despite the considerable amount of work devoted to various aspects of psychological training of athletes, many questions remain about the effectiveness of these tools in different sports, at different stages and periods...

## Results and Discussion

During this study, we conducted a study aimed at studying the peculiarities of manifestation of mental states of sportsmen specializing in karate. To study the parameters of interest to us the following technique was applied: "The technique of diagnostics of self-assessment of mental states".

This technique was used to obtain objective data on the severity of various mental states in the population under study. During the use of this technique, the subjects were offered the following instruction: "We offer you a description of various mental states. If the condition is very suitable for you, you get 2 points for your answer; if it is suitable, but not very suitable, you get 1 point; if it is not suitable at all, you get 0 points".

The same athletes were tested: firstly, immediately before home fights; secondly, before guest fights. This was done to analyze their condition under different conditions and, therefore, to outline the problem of the study.

Behavioral testing at the beginning of the study revealed the following picture (Table 1).

*Table 1. Manifestation of mental states of the subjects at the beginning of the study (in points)*

	At home	On a visit
Anxiety	9,2	11
Aggressiveness	10	11,2
Frustration	8,6	10,7
X mid	9,26	10,96

Table 1 presents data on the expression of mental states in athletes specializing in karate. The data presented were obtained by testing with a specialized questionnaire aimed at revealing the level of expression of the following states: a) anxiety; b) aggression; c) frustration. The testing was carried out immediately before the "home" and "guest" fights.

The analysis of the data allows us to assert that there are certain differences in the expression of the states under study in athletes during "home" and "guest" fights. The next stage of the research was to study the influence of different mental states on the effectiveness of technical and tactical actions of martial artists. This connection was revealed during the analysis of two fights, before which tests of mental states were carried out. This allowed us to calculate the correlations between the studied indices. We would remind, that the research of effectiveness of technical and tactical actions was made by means of a pedagogical observation with the subsequent registration of results in a report and their further interpretation.

To obtain objective data about the presence and strength as well as the reliability of the relationship between the studied indicators, a correlation analysis was performed using the EXEL software [30].

The data obtained in the correlation analysis are presented in Table 2.

*Table 2. Correlation analysis data*

	Effectiveness TTA	p		Effectiveness TTA	p
Anxiety	0.361	$\geq 0.05$	Anxiety	0.145	$\geq 0.05$
Aggressiveness	- 0.213	$\geq 0.05$	Aggressiveness	- 0.250	$\geq 0.05$
Frustration	- 0.626	$\geq 0.05$	Frustration	- 0.820	$\leq 0.05$

The correlation analysis revealed that in most cases there was no significant relationship between the severity of mental states and the effectiveness of technical and tactical actions. However, it was determined that there is a reliable relationship between the level of frustration expression and the effectiveness of techniques for tactical action (TTA) during guest fights ( $r = - 0.820$ , at  $p \leq 0.05$ ).



The revealed connection suggests the necessity of decreasing this index before the guest fights, which was the reason for conducting the formative stage of the research. The formative stage lasted from September to December 2020. During this stage organizational and methodological support of the process of psychological training of martial artists was applied in the group of martial artists.

A comprehensive method of mental regulation was included [7]:

- conversations with athletes,
- suggestion,
- auto-training,
- self-hypnosis,
- self-belief,
- self-talk.

The methods of self-regulation, the content of which is determined by the reflection of one's physical self, are specifically highlighted (Table 2).

*Table 3. Self-regulation techniques*

Self-regulation techniques used	control and regulation of the tone of facial muscles
	control and regulation of the pace of movement and speech
	special breathing exercises
	release: this is a way of releasing emotional tension

As independent means of mental regulation were applied: self-influence, self-persuasion, self-talk, which are based on the application of words by the athlete, therefore belonging to the so-called verbal influences.

Psycho-pedagogical influences of an educational nature included the following subsections [8]:

Optimization of the process of formation of sports motivation, building athlete's confidence in their abilities.

Mental regulation techniques were used to create a state of mental readiness in athletes.

A very important area of psychological training of a martial artist is the use of autogenic training. There are several variants of autogenic training.

In preparation for a fight one of variants of autogenic training which was repeated 3-4 times in a circle was used.

In addition, we used the following verbal means of psychic regulation.

"Formation of internal supports" - was based on creating confidence in the athlete's abilities, confidence in his/her ability to make the right decision and its consistent implementation.

"Deactualization the opponent". It was pointed out that this athlete had an advantage over his opponent in tactical preparedness and in his ability not only to make the right decisions, but also to implement them consistently, which the opponent cannot do as effectively.

"Removing the prohibition against making a mistake". Athletes were advised to take deliberate risks before a fight against a relatively weak opponent to suppress his will to resist.

"Desensitization". He was asked to recall instances where his plan collided with his opponent's more effective plan; to recall the adverse state in which this occurs.

The strategy of overcoming frustration is characterized by a rapid transition from a state of calm rational analysis of the situation to energetic action to achieve the goal. Successful resolution of the situation is facilitated by eliminating excessive reactions to failure and instilling confidence in one's own abilities. Self-hypnosis was used for this purpose. Self-inspiration techniques were used to increase activity and improve well-being before the fight. The formulas were strictly individual, but brief and in affirmative form. For example: "Intentions are firm", "I will accomplish what I have planned", "I feel great", etc.

Application of ideomotor training (according to A.V. Alekseyev's method). Seven stages of ideomotor training.

First stage - warm-up.

Second stage - formation of extremely precise mental image of a trained or improved movement.

The third stage - a mental representation of the movement in its ideal version with eyes closed.

Stage four - check the compliance of the duration of the imagined movement to the actual performance (on a stopwatch).

Stage five - translate the mental image into muscle with the help of simulation.

Sixth stage - forming a chain of separate movements in succession to form a single action and identifying a "basic element" (main movement), the exact execution of which ensures the success of the whole combination.

Seventh stage is the naming of the "basic element" [3].

The next direction in psychological training of sportsmen was the application of yoga-practices in the structure of the training process.

To methodically train martial arts athletes with yoga elements it is necessary to know the mechanism of action of these exercises on sportsmen's organism and to foresee the effects of their use, therefore it is very important to correctly choose the complex of exercises for different sports, which improve self-management level.

There is a significant amount of work confirming the effectiveness of yoga to enhance the body's capabilities [6; 9; 10; 14; 26; 25; 29].

Athletes are not going to engage in cardiac arrest or do something similar, but the very fact that it is possible is of great scientific importance. If all athletes know that the body responds to consciously induced signals, that heart rate, blood flow and other processes can be controlled by an effort of will, then clearly every athlete can affect their mental and physical fitness and learn to control their emotions.

A study of yoga shows that the main objective of the class is to cultivate absolute balance and conscious control of the senses. To realize control of one's body and mind, an athlete needs to understand the mechanisms of this process through self-observation and self-learning. It is necessary to learn to feel one's body, to understand how the mind and perception work.

Another area of psychological training was the use of acrobatic exercises to form willpower qualities of martial artists.

Acrobatic exercises aimed at the development of volitional qualities.

1. Jumping down and jumping on a limited area (30 seconds).
2. Side-jump over an obstacle (gymnastic beam) with support on the left (right) hand.
3. Jump over obstacles from a "folding" bridge.
4. Same as above without a bridge, followed by a somersault.
5. Side turns from straight and lateral stance in small conditions (mat corridor).
6. Long somersaults forward from a run over an obstacle (performed together 3-4 somersaults).
7. Head and handstand with power from crouch with switching off the visual analyzer.
8. Series of back somersaults over shoulder.
9. Front somersaults in leaps over partner (first somersault forward and second somersault also in front, but leap over the first somersault).
10. Long somersault forward over obstacle and somersault forward into a tumble on hands followed by a roll over chest.
11. Back drop from high ground into hands of partners.
12. Facing each other, do an upward jump with chest bump, landing in a crouch, back roll and upward jump with 360° rotation.
13. Standing with back to each other, hands up, grip simple. First performs a bent forward bend, second performs a push-back somersault over the partner's back, arms up.
14. Acrobatic combination: a series of somersaults forward and backward in grouping, standing on head and hands, side flips in limited space (corridor of mats), jumping on place with turn over 360 degrees (performed for time).
15. Acrobatic combination: from a standing position with a running start, long somersault forward through an obstacle to the crouch, turn around, back somersault, head, and handstand with power, drop down with power to the crouch, somersault forward, in tempo up jump with a 360° turn.

At the end of this stage, the indicators of interest were re-examined, and the following picture emerged (Table 4).

*Table 4. Manifestation of mental states of the subjects at the end of the study (in points).*

	At home		On a visit	
	At the beginning of the research	At the end of the research	At the beginning of the research	At the end of the research
Anxiety	9,2	8,2	11	10,6
Aggressiveness	10	9,1	11,2	10,2
Frustration	8,6	6,2	10,7	8,8
X mid	9,26	7,83	10,96	9,86

Table 5. Changes in TTA performance during the experiment (in points)

	At home		On a visit	
	At the beginning of the research	At the end of the research	At the beginning of the research	At the end of the research
Effectiveness TTA	47,38	49,5	42,25	44,87

Analyzing the data presented in Table 4, we can confidently say that there were positive shifts in the expression of mental states during the home fights, especially it is noticeable in the indicators of frustration. However, application of Student's t-test revealed no significant difference between anxiety and aggressiveness ( $t = 2.11$ , at  $p \geq 0.05$ ,  $t = 1.50$ , at  $p \geq 0.05$ , respectively). There were significant changes in frustration scores ( $t = 2.28$ , at  $p \leq 0.05$ ).

Analysis of data, presented in table 5 has shown, that the efficiency of technical-tactical actions has increased too, however, despite visible differences (using descriptive statistics methods), processing of received data by means of t-student does not reveal statistically reliable differences ( $t = 0,61$ , at  $p \geq 0.05$ ).

Analysis of the dynamics of mental states and TTA performance during the guest bouts revealed that there is a positive dynamic of the studied indicators.

But Student's t-test revealed no significant difference between anxiety, aggressiveness, and frustration ( $t = 1.57$ , at  $p \geq 0.05$ ,  $t = 1.51$ , at  $p \geq 0.05$ ,  $t = 1.92$ , at  $p \geq 0.05$ , respectively). The same pattern was observed in TTA performance ( $t = 0.98$ , at  $p \geq 0.05$ )

## Conclusion

Theoretical analysis of literary sources on the problem of research has revealed the fact that the works devoted to the problem of development and implementation of means promoting optimization of psychological state of a martial artist are not so numerous and they mostly concern athletes of high level of sportsmanship. In this connection, the above said allows us to consider the chosen theme to be actual in terms of the development of organizational and methodological support of the process of formation of the optimum pre-start state of a martial artist (by the example of karate).

To increase the effectiveness of educational and training process and competitive activity of athletes, based on the analysis of scientific and methodical literature and our own experience, we have formulated organizational and methodological support of the process of formation of an optimum pre-start condition of martial artists (on the example of karate), including a combination of psychological training, such as: autogenic training; ideomotor training; yoga practice; means of development of volitional qualities.

To prove the effectiveness of the proposed organizational and methodological support of the process of forming the optimal pre-start state in martial artists (using karate as an example), we conducted a pedagogical experiment which included the following stages: the ascertaining investigation, the forming experiment, and the analytical part.

The ascertaining research, conducted in a group of martial practitioners, specializing in karate, revealed a natural tendency to an increase in the severity of negative mental indicators during guest fights.

The next direction of the ascertaining study was to reveal the degree of influence of different mental states on the effectiveness of athletes' technical and tactical actions. Immediately before the fight, control measurements of the level of mental states were taken, and during the fight, the efficiency of technical and tactical actions was studied using pedagogical observation. Further, the presence of correlations between different mental states and the effectiveness of technical and tactical actions was revealed using well-known methods. The analysis revealed a strong, negative, reliable connection between the frustration indexes and the efficiency of TTA during guest fights ( $r = -0.807$ , at  $p \leq 0.05$ ). This was the rationale for conducting the formative phase of the study.

During the formative stage of the study, psychological and pedagogical recommendations aimed at reducing the level of manifestation of negative mental states were introduced into the educational and training process of athletes specializing in karate. These recommendations were developed by leading sports psychologists and their effectiveness has been proved. The formulated recommendations were applied for several months.

Repeated examination of the studied indicators at the end of the formative stage of the study has revealed the following picture. Anxiety and aggressiveness levels before home fights decreased, but not significantly. Frustration scores before home fights have positive significant dynamics. TTA performance has positive but also not reliable changes. Prior to guest fights, despite positive shifts, no significant changes in mental status scores were found. Same picture with TTA efficacy.

To summaries, despite the lack of reliable positive changes in most of the indicators, it is unreasonable to talk about the ineffectiveness of the proposed remedies. It is most likely that the result is due to the short duration of the psychological impact.

## Recommendations

To increase the efficiency of the educational and training process and competitive activity of martial artist athletes it is recommended to use the developed organizational and methodological support of the process of formation of optimum pre-start state in martial artists (on the example of karate) in institutions of sports orientation, formed based on analysis of scientific and methodical literature and the author's own experience. Presented developments include a combination of various means of psychological training, such as: autogenic training; ideomotor training; yoga-practices; means of development of volitional qualities.

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# ONLINE CONSUMER GOODS PURCHASE BEHAVIOR, E-WOM

Cuong Hung Pham<sup>31</sup>

## Abstract

This examination expected to equitably break down the elements that impact e-WOM on Online Consumer Goods Purchase Behavior: Evidence from Vietnam. Created on past quantitative and measurable discoveries, the hypothetical model and suspicions for the investigation were created. To recover crude information, an example was led with 380 members. The investigation ideas were tried utilizing numerous relationship and way assessment. As a reaction, client experience, relative worth, certainty, and connection to the organization fundamentally affected e-WOM and brand acknowledgment. Additionally, the discoveries showed that trust in e-WOM certainly affected brand mindfulness. Business elements in the customer retail area ought to consider the significant elements of these factors to decide and respond to the assumptions and principles of shoppers.

**Keywords:** Contentment of the Consumer, Relative Value, Trust, Allegiance of the Consumer, E-WOM, Brand Awareness.

JEL: M30

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## Introduction

The speed and effectiveness at which clients can speak with retail outlets affect client dynamic. To diminish the exertion connected with settling on a decision, a few clients go to the Web for buys [3]. In spite of the fact that shopping clients give time and exertion to achieve various undertakings and as the contemporary purchaser is substantially more tedious than any time in recent memory, thought ought to be given to the benefits of offering solace for web shopping. One of the main advertisers of customer weakness to accept internet shopping has been online reasonableness [14]. Seiders et al. (2000) recommend that the worth inspire dealers that shoppers put on usefulness. An examination adds to the writing on the selection of web based shopping by the buyers of non-industrial nations. Likewise, this paper inspects the impact of E-WOM, trust, convenience, and usability on internet shopping through sites with the directing job of online experience [6].

Hypothetical and administrative experiences identified with E-WOM and electronic trade shopping conduct were created [31]. The connection between online shoppers and brands is implanted in a similar relationship displaying worldview yet become a huge issue for organizations in the 21st century with the expansion of Web 2.0. To give bits of knowledge about online commitment and the interaction behind an investigation led a deliberate writing survey on online upgrades insight, versatility, e-WOM, positive/negative feelings, memory, and online commitment. Additionally a far-reaching system uncovering the stream from upgrades to e-WOM on online retail customers was introduced [18].

To rebuild the working constructions of the grocery store and feature the productivity of the assistance advertised. At an alternate level, traders would focus on expanding the quantity of cell phones and furthermore how they upheld force and how clients esteem term and assets. The momentum research proposes that clients are agreeable to retailers saving them period and assets. Online vendors are altogether ready to give greater effortlessness as store objective has gotten negligible, and clients can shop 24 hours per day, seven days out of every week from any territory [3]. Associations, in this way, need to build up a more careful understanding of the outcomes of computerized availability.

The level of people utilizing the Internet across the globe in June 2016 had been 3,611 billion. Specifically, with the measure of 49,063 million people, Vietnam positions fifteenth all through the world. Numbers have demonstrated that the online world assumes a fundamental part in publicizing and availability as a significant device. A few clients expressly or certainly partake in one or possibly more online discussions [1]. Accordingly, the Digital world implied a generally new and progressively basic part of overall computerized mouth word [12; 13].

As a medium to divide data between web clients, eWOM is talked about in detail. This mediation has an immediate association with client loyalty, hence influencing the aggregate estimation of the organization. Along these lines, right now, increasingly more consideration has been paid to the effects of eWOM on clients [8]. EWOM is unmistakable from customary ad since it is called client made non-business correspondences. Such messages give every one of the first buyers' viewpoints and straightforwardly sway the other client buy choice. These outcomes can be valid or bogus, and offer brand investigations with one another; miserable clients will in general notification just brand lacks and spread input of such shortcomings [7].

Brand personality is without a doubt an asset, just as an incredible brand picture that would give a powerful essential advantage through client commitment, nature of items, and improve the presentation of the enterprise. Clients are more plausible to have a superior brand personality to purchase items. Nonetheless, simply the one that is vivaciously inspected by clients can persuade different clients and initiate their buying expectations all through the way toward setting up brand mindfulness. A positive message of the brand is proportionate to the particular goal of the client (Arslan, 2014). Thusly, to break down the components that influence client-buying conduct, eWOM and brand acknowledgment are fundamental. Analyzing the scholarly chips away at reasonableness, it is evident that there are a few parts of effortlessness. There was no agreement, by and by, on what these estimations are [26]. Finally, since most online effortlessness overviews zeroed in chiefly on the association with purchasing goals, the current investigation is in accordance with Roy et al. (2016's) concentrate just as shuts the disparity by analyzing the organization, separately, online reasonableness, intellectual intentions, happiness, and e-WOM. From a specialized perspective, characterizing angles that decidedly affect buying conduct aims and execution will assist the executives with beating the difficulties to an exceptional execution.

Campanies have acquired countless customers looking for an all in one resource activity. For chain stages, shoppers with high brand esteem regularly book their vehicle administrations. Normally, these customers are brand sweethearts or attracted by remuneration projects to specific brands. On the other limit, a few customers get to outsider stages to assess voyaging choices and settle on the correct choice to serve their requirements. Consequently, in the advanced web age, clients are searching for online information got from contact with one another in regards to items or administrations the result of their individual encounters in choosing to purchase a brand [28].

As per Mittal, Vikas and Wagner, (2001) [20], the potential clients are probably going to talk about their positive encounters with others. While satisfaction is portrayed as the differentiation, individually, supposition and proficiency, quality, and happiness change extensively. Happiness is supposed to be a decision made after training; however, consistency may not be something very similar [24]. In addition, client faithfulness shifts from one case to another. A shopper may be satisfied with products or administrations, and connection, a purchasing decision, a merchant, a utility supplier, or any of such credits. At the end of the day, client experience has become a profoundly singular assessment that has been vigorously affected by assumptions.

Each organization needs to distinguish the satisfaction of buyers concerning their industry in the contemporary serious market environment. Partners much value the endeavors to fulfill buyers' requests and assumptions. At that point, to forestall a huge hole around conveyance quality and administration principles, a few experts ask organizations to zero in on a target that is nearer to the capital of the customer. Thus, as opposed to inquisitive if customers are content, they urge firms to survey how proactively buyers hold them [32]. Shopper fulfillment is resolved not simply as far as item particular or execution, yet in addition regarding customer connections and an item. Correspondences between the customer just as the products or administrations and furthermore the utility supplier give consumer loyalty [4].

## Literature Review

There are two fundamental translations of the general estimation of the shopper. In the first place, it is a summit of the pre-buy getting (supposition), assessment during the installment (presumption versus got) just as after-deal (after-use) assessment (suspicion versus acquired) of clients. Second, the genuine estimation of the purchaser requires a divergence across the advantages given and the penances made. The benefits incorporate all the planned revenue of the clients [21]. Bargains include monetary objectives (cost) just as hostile to money related contemplations.

Trust. The certainty of shoppers in assistance organizations all through the calling of administration marketing has been one of the perspectives that sway their possible practices. Trust compares to a propensity to rely upon a reliable trade accomplice. Trust additionally happens when another individual has esteem in the presentation and genuineness of a communication accomplice. The certainty of purchasers, regardless of whether in the whole organization or among laborers, is essentially affected by their fulfillment [15]. The outcome demonstrates that even an organization's more prominent or lesser client reliability is, consolidated, his certainty all through the foundation would be the more noteworthy or lesser. Trust altogether affects customers' social design, explicitly on the approach of surrendering or be respectful to an item supplier [29]. By and by, results from factual investigations have shown that high convergences of shopper trust in an organization have positive communications with the more grounded brand esteem inclinations [25]. Trust makes benefits in exchange for customers, like decreased pressure, hostile to confirmation, and frailty. Such advantages influence brand picture satisfaction, especially across the more muddled item field (THURAU and WALSH, 2002). Client faithfulness is an image of a significant psyche towards an item that adds to the item's consistent buy over the long haul.

Dependability. The dedication of the buyer is described as an individual obligation to purchase the ideal brand. On the other hand persistent conveyance all through the future, despite logical effects and showcasing procedures that may trigger exchanging practices (Oliver, 1997). Devotion could be viewed as among the factors in brand mindfulness. Purchasers stay focused on a products or administrations organization. The specialist co-ops are likewise substantially more slanted to purchase all the more frequently (value hardness), try different things with new merchandise or administrations of the organization (buyback tendency), and show administrations and items to any other person (verbal), make proposals to organizations (complaint direct).

It was discoveries shown that the impacts of positive and negative e-WOM on brand value are reliable, regardless of brand birthplace. Strangely, buyer ethnocentrism positively affects brand value for homegrown brands, yet does not negatively affect brand value for unfamiliar brands.

Electronic Word-Of-Mouth (e-WOM) could be portrayed as all private correspondence focused at clients by means of Web-based innovation connected to the utilization or highlights of explicit administrations and merchandise or their providers. This includes correspondence around organizations and customers and furthermore between customers themselves [17]. Association with E-WOM could occur in various conditions. Clients can distribute their insights, criticism, and input on merchandise and enterprises on online discussions, rating pages, social bookmarking destinations, chatrooms, web-based media, and so forth E-WOM applies to make chatting on the Internet that empowers people to compose with respect to their understandings in actuality. Talk about their viewpoints, item or administration encounters, considerations, or ideas.

These perspectives are promptly accessible to different clients looking for data in regards to a particular item or administration [27]. Nevertheless, e-WOM collaborations are substantially more noticeable than regular



correspondences. These have been made continuously quantifiable by the conveyance strategy, the volume, and the nature of e-WOM communications.

This contains not simply the item's advantage, just as the significance of advancement devices, licenses, logos just as other immaterial resources, incorporating skill in assembling. There have been a wide range of brand picture viewpoints, and they are overall for the most part reliable with both the central thought of brand mindfulness as the extra worth to a decent and administration as an issue of past marking and promoting exercises.

Steadfastness. The steadfastness of the shopper is portrayed as an individual obligation to purchase the ideal brand. On the other hand nonstop conveyance all through the future, despite logical effects and showcasing techniques that may trigger exchanging practices (Oliver, 1997). Faithfulness could be viewed as among the factors in brand mindfulness. Shoppers stay focused on a merchandise or administrations organization. The specialist co-ops are additionally substantially more slanted to purchase even more regularly (value insensitivity), explore different avenues regarding new merchandise or administrations of the organization (buyback tendency), and show administrations and items to any other individual (verbal), make proposals to organizations (complaint direct).

This contains not simply the item's advantage, just as the significance of improvement apparatuses, licenses, logos just as other elusive resources, incorporating skill in assembling. There have been a wide range of brand picture viewpoints, and they are overall generally predictable with both the crucial thought of brand mindfulness as the extra worth to a decent and administration as an issue of past marking and displaying exercises.

Brand character offers a typical factor to see displaying efforts and assess a brand's worth. I perceive that there are a few distinct parts of communicating and abusing the meaning of an item to the benefit of the organization. Brand value makes guidelines for buyers and organizations the same. Brand value makes an incentive for shoppers by the beneficial creation and buying of information, acquiring certainty all through their dynamic, improving purchasing, and adding to self-completion. Brand picture creates abundance for organizations by fortifying publicizing operational effectiveness, creating brand mindfulness, upgrading piece of the pie, securing impact over wholesalers, and separating itself from the opposition [2].

Informal exchange is a considerably strong specialized technique with a one of a kind showcasing job. The client has been the person who starts the discourse contact express. People share their sane or silly perspectives and send each other and proposals about such a bistro where they can eat, a novel they find interesting, or a shop where they buy top-notch items at a particularly sensible cost. Since informal exchange is directed among partners, companions, or family members, clients have never believed WOM to be limited time and that it assumes a fundamental part in a shopper's buying dynamic procedure. Interpersonal interaction cuts across and develops above correspondence mess as it is given from a medium like a companion or a partner. Long-range interpersonal communication is a main factor behind so many purchasing choices by 20 to 50 percent of shoppers. Its effect is most intense when clients first buy an item or in any event, when brands are similarly costly, and a few different factors which largely cause people to investigate further and seek after more considerations. WOM's effect is in fact solid once there is a solid relationship between individuals trading information. The innovation has modified the plan of action of customary correspondence.

Informal exchange is a considerably powerful specialized strategy with a one of a kind advertising job. The client has been the person who starts the discourse contact state. People share their normal or unreasonable perspectives and send each other and proposals about such a bistro where they can eat, a novel they find entertaining, or a shop where they buy top-notch items at a particularly sensible cost. Since informal exchange is led among partners, companions, or family members, clients have never believed WOM to be special and that it assumes a fundamental part in a customer's buying dynamic technique. Interpersonal interaction cuts across and develops above correspondence mess as it is given from a medium like a companion or an associate. Interpersonal interaction is a main factor behind so many purchasing choices by 20 to 50 percent of customers. Its effect is most intense when clients first buy an item or in any event, when brands are nearly costly, and a few different factors which largely cause people to investigate further and seek after more musings. WOM's effect is to be sure solid once there is a solid relationship between individuals trading information. The innovation has changed the plan of action of ordinary correspondence.

Web 4.0 mechanical developments permitted clients to impart the web socially through content age and to trade, imparting insights, and thoughts. Electronic surveys and appraisals, like an examination of a distribution, are effective approaches to help an item through commitment through computerized proposals from companions. Hennig-Thurau et al. (2003), the headway of correspondences innovation has extended the opportunities for clients to gather unprejudiced item subtleties from a few different clients, in this manner empowering clients to convey their purchaser related guidance through eWOM. eWOM has a basic task to carry out in the dynamic interaction for buyers to purchase.

Individuals' sentiments have a substantially more critical effect than customary publicizing. The conceivable clarification for WOM's accomplishment is clear: WOM is considered by clients as reliable, especially in contrast with advertisers' association attempts since data is offered to them through another client's fair assertion. Since the recipient of proposals from companions confides in the beneficiary, it lessens any uneasiness, delicacy, and disarray

about a particularly specific activity (Augusto de Matos and Rossi, 2008). In spite of the fact that WOM has frequently played a fundamental capacity in the formation of client discernments, because of the computerized multiplication of easygoing online media stages, including the Web, text informing, publishing content to a blog, it is currently a considerably more significant device in the course of recent many years.

Clients can share on blog locales, online media, conversation sheets, research websites, and so on their musings and remarks about a brand (CHEUNG AND TADANI, 2010). The lead of "Verbal" satisfies people's essential to make a critical part for different clients. The sexy reason for supporting people in making a considerably more suitable purchasing choice is the defense for the transmission of subtleties by clients to different people. Clients need to focus on others' perspectives, ideas previously and during shopping. While doing this for existing family members, more distant family individuals in conventional WOM, the information they need can be gotten to by drawing in with clients they don't have the foggiest idea; in any case, with others, they hold comparable inclinations in virtual WOM. Today, essentially each stage, which renders online deals, offers an opportunity for clients to distinguish online client surveys and furthermore gives the chance.

To compose/read different client surveys to the producer just as gives a chance to get/offer guidance and direction. Most purchasers are influenced by these surveys and evaluations while thinking about the purchasing choice and build up an objective or unreasonable viewpoint towards the brand. Strong shopper investigation is "a friend produced brand appraisal which advances the dynamic interaction for buys by the client" (Mudambi and Schuff, 2010). As shown by Lusky (2012), 70% of clients internationally totally trust online input, while just 47% accept regular print and sent advertisements. Shopper trust in client audits has in reality been accounted for to ascend by 15%.

## The Hypothetical Model

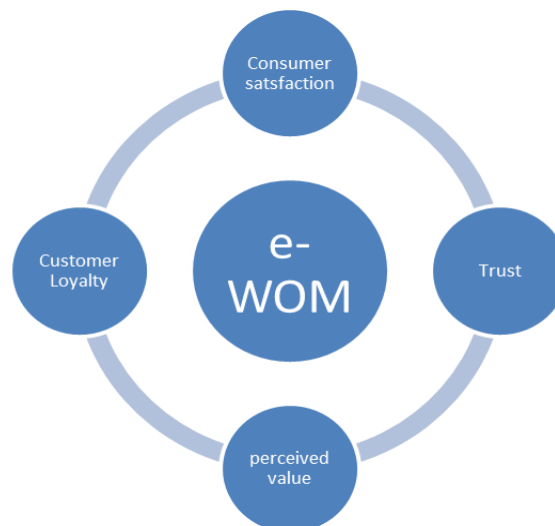
Numerous applied and quantitative examinations have demonstrated that there is an immediate relationship because of e-wom across brand improvement. The four variables are influencing the-wom, including purchaser's fulfillment, given worth, trust, and buyers' viewpoint, e-WOM, just as brand value. A representation of this current investigation hypothetical connection framework, presented from earlier conjectured plans.

H1: The satisfaction of the shopper, the relative worth, the regard just as the devotion of the buyer is expected to have a valuable and direct impact on e-WOM.

H2: The satisfaction of the shopper, the relative worth, the trust just as the devotion of the client is expected to straightforwardly affect brand mindfulness.

H3: E-WOM is expected to straightforwardly affect the value of the item.

H4: Consumer's happiness, genuine worth, trusts just as customers devotion is hypothesized to impact brand acknowledgment through e-WOM certainly.



## Data Analysis

The experimental model methodology was utilized across the exploration to inspect the observational information assembled through example review reactions. The measurement was predicated on a Likert extent of five focuses that secures from "1–Disagree" to "5–Agree." For this investigation, the example populace was clients who live in Ho Chi Minh City and furthermore have a comprehension of online exchanges. With additional examination discoveries, 380 occurrences of information were accumulated and investigated in worthy quality.

The exploration utilized version 20.0 of that equivalent Social Sciences Statistical Package (SPSS) innovation to deal with information. To start with, Experimental Factor Assessment (EFA) and Efficiency Testing were done to characterize the interconnections between assortments of study boundaries and to evaluate their reliability and validity. Different Regression, just as Path Assessment, has been utilized to examine the causal association among boundaries and afterward confirm the suppositions of the examinations.

### *Factor assessment and dependability*

All through this exploration, two exploratory factor appraisal (EFA) were assessed Kaiser-Meyer-Olkin As well as Bartlett's sphericity measure, and Varimax Velocity of 25 separate elements items and 16 dependent boundaries items. For the two groups of indicator factors (KMO= 0.942) just as unexpected factors (KMO= 0.939), the KMO estimation of test propriety was higher than as far as possible on a fantastic determinant appraisal of 0.59 [30]. In addition, the sphericity test by Bartlett demonstrated fundamental (Sig=0.000), recommending the satisfactory relationship among factors. The synopsis consequences of free boundaries assembled into four sections (CUSA, PEVA, TRUST, and CUSLOY) are appeared in arrangement 1. All leftover item factor loads meet the necessary particular of 0.39 between 0.513 to 0.836 [9].

The Alpha standards of the Cronbach extended the legitimate consistency of 0.921, 0.932, 0.850, 0.781 items into every part. According to Pallant (2007) [23], the alpha meaning of the Cronbach above 0.59 differential is considered adequate, while the more fitting handiness should outperform 0.69.

*Table 1. Synopsis of free factors and dependability coefficients*

Variables	No. parameter loadings	Cronbach Alpha
Consumer Satisfaction(CUSA)	8	0.921
Perceived Value (PEVA)	6	0.932
Trust(TRUST)	5	0.850
Customer loyalty(CUSLOY)	2	0.781

Moreover, the stacking proportion of outstanding units of unexpected boundaries differing from 0.518 to 0.832, ordered into two components (EWOM and BE), as demonstrated in Table II. The alpha ascribes of the Cronbach have been 0.939 just as 0.889.

*Table 2. Rundown of ward factors and dependability coefficients*

Parameters	Number of items loading	Cronbach's Alpha
E-WOM	10	0.939
Product Equity (PE)	6	0.889

## Research Findings

Personal information (N=380)

*Table 3. Descriptive Statistics*

		Frequency	Percentage
Gender			
Male		160	42%
Female		220	58%
Age group			
	18–25	120	32%
	26-30	110	29%
	31-40	80	22%
	41-60	70	18%

Education		
Vocational school	80	21%
College degree	100	26%
Bachelors degree	130	34%
Post University	70	19

Income		
Above 5 Million	130	34%
5-10 Million	110	29%
10-20 Million	80	21%
20-29 Million	60	16%

Table 4 demonstrates that there have been solid relationship between four illustrative factors (CUSA, PEVA, TRUST, and CUSLOY), the referee (EWOM), and furthermore the contingent (BE). The outcomes imply that the more noteworthy e-WOM just as brand acknowledgment level is the higher commitment, real worth, certainty, and acquisitions.

Table 4. Correlations among variables

	E-WOM	1	2	3
CUSA	0.539			
PEVA	0.578	0.683		
TRUST	0.630	0.601	0.702	
CUSLOY	0.534	0.679	0.641	0.543

MEAN	3.39	3.53	3.51	3.38
S.D	0.724	0.721	0.722	0.731

Correlation is significant at the .01 level (2-tailed).

H1: The bliss of the customer, the relative worth, the certainty just as the responsibility of the buyer is accepted to have a critical and explicit impact on e-WOM. The result showed that the cooperation was firmly sure.

H3: E-WOM is attempted to affect brand acknowledgment unequivocally and expressly.

H2: Consumer fulfillment, relative worth, persuades, and brand mindfulness is expected to affect brand mindfulness firmly and successfully. The perceptions showed critical causal connections among four logical factors (CUSA, PEVA, TRUST, and CUSLOY) and the dependent boundary (BE), with ( $r = 0.537$ ,  $p < 0.001$ ).

The roundabout effect of an outstanding capacity on the indicator factors through both the parley boundary has been the aggregate mix of the consequences for the mediate variable of a particular free boundary, and the effect of the referee variable across the logical setting. Purchaser fulfillment, relative worth, certainty, and client experience are accepted to indirectly affect brand mindfulness through e-WOM. As examined, client reliability has emphatically affected e-WOM.

## Discussions

The quantitative discoveries of this exploration sponsored the applied model, which set up the hypothetical system for the examination of astounding quality to explain and figure the brand estimation of shopper retail organizations 'advanced requesting and buy administration. To begin with, the examination uncovered that overall significance had been a fundamental thought affecting e-WOM, joined by certainty and in conclusion, client experience.

On the other course, when customers have pointedly relative worth, certainty, and responsibility, they may have an ideal brand value assessment in light of the fact that these three ascribes are firmly identified with brand mindfulness. While the satisfaction part of the shopper is a huge relationship with brand mindfulness, it may not affect the essential dependent variable. Contingent upon the size of the aftereffects of these perspectives, this examination may show that the e-WOM variable has been the most critical thought influencing brand acknowledgment in Ho Chi Minh City's electronic buying and installment business. The discoveries of this investigation, as such, proposed that e-WOM has been the most basic need.

To manage them to decide brand acknowledgment, joined by the trust just as relative worth, and ultimately, commitment and experience of the buyer. To close, the quantitative estimations of this examination on the dating

connection between customer fulfillment, genuine worth, certainty, client maintenance, e-WOM, and brand mindfulness are significant to most fundamental applied and logical proof. The outcome upholds and recognizes explicit examination speculations. They offer extra ethically faultless logical evidence that maybe the hypothetical model of the exploration on the Vietnam electronic retail area is considered genuinely proper. The work assists with growing the calculated and target proof on the shopper fulfillment impact, cost, and certainty, dedication to the customer, e-WOM, and brand worth.

The discoveries show some distinct rules for retail client organizations. The exploration gives practical logical verification on the genuine connections among purchaser fulfillment, relative worth, trust, and brand mindfulness, e-WOM, and brand acknowledgment through the experimental examinations perceptions. Trust has been a fundamental thought influencing web deals item brand acknowledgment in Ho Chi Minh City, joined by a relative worth, e-WOM, customer fulfillment, and fulfillment, as per the aftereffects of the examination.

As a reaction, directors and advertisers have more comprehension of the necessities and interests of their customers by recognizing and recognizing the fundamental and fundamental elements of these causes. The administrators would then be able to display promoting efforts to change their practices and rather support the brand acknowledgment of the organization. For delineation, computerized retail organizations are prescribed to decrease selling costs in a year for explicit specific delayed periods to convey promoting initiatives. Raise rehash exchanges from current clients by building and keeping a profitable PC framework with data accumulated from all organizations and client advertising channels; or customize brands, offices, and warnings. Furthermore, answers to every purchaser, support snappier carry out and extension of new things and administrations including the partnership gives various ways in a particularly innovative venture, fortify special satisfaction levels to draw in more shoppers, make correlation rundowns to catch client accounts. Strengthen clients' effectiveness, happiness, and distribution with the end goal that they can devote themselves to existing records.

## Conclusion

This examination pointed toward researching the variables affecting e-WOM on Online Consumer Goods Purchase Behavior: Evidence from Vietnam. The hypothetical system and speculations for the examination were created dependent on past experimental and factual investigations. Most investigation suppositions were embraced and recognized after examination, which offered viable logical evidence that the hypothetical construction of the overview of the Vietnam retail market is viewed as genuinely reasonable. Shopper fulfillment markers, relative worth, certainty, client experience emphatically affect e-WOM and brand acknowledgment from the examination discoveries. The satisfaction of clients, relative worth, regard, and responsibility of purchasers are to be sure the basic instruments to outline. Also, expect brand mindfulness and e-WOM. Significant partnerships are working in the retail area in Ho Chi Minh City specifically and furthermore in Vietnam. Specifically, they should consider the fundamental elements of these factors to completely comprehend and conform to the requirements and expectations of customers when reserving a spot for their item. The discoveries of the investigation can be utilized as fundamental and pertinent data for area heads and promoting organizations to acquaint methods and plans with adjust and improve their image mindfulness all through the planned future, to tempt customers that are more possible.

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## **PART II. ECOLOGY AND AGROECONOMY IN THE CONDITIONS OF DIGITALIZATIO**

## TRENDS AND MAIN DIRECTIONS OF DEVELOPMENT OF THE AGROINDUSTRIAL COMPLEX IN THE NEW ECONOMIC CONDITIONS

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### Abstract

The article examines the trends and main directions of development of the agro-industrial complex in the new conditions of management. The agro-industrial complex of the country is an integral socio-economic system, consisting of organically interconnected structure-forming elements, the functioning of which interdependent the development of both individual elements and the entire system as a whole. The openness of such a system is manifested, first of all, in the fact that its functioning is significantly influenced not only by the internal (micro), but also by the external (macro) environment in relation to it.

**Keywords:** Innovation, Agriculture, Economy, Gross Output, Investment

JEL: O30, Q10

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## Introduction

The political, organizational and economic transformations carried out during the years of economic reform have not yet yielded positive results [1; 5]. The crisis in which the agricultural sector found itself in the conditions of the abolition of centralized regulation of prices, wages, material and technical supply, investments, material supplies, an increase in budget, loan and foreign exchange deficits, led to a drop in the production of agricultural products and the food industry, a reduction in the cultivated area and livestock, construction curtailment.

## Methods

The volume of gross agricultural output over the years of implementation of reforms decreased by more than a third compared to 1990, labor productivity during the same period fell by 40%, food production decreased by more than half, the level of wages in the industry decreased in relation to the average national economy. Over 56% of agricultural enterprises of various organizational and legal forms remain unprofitable. Overt and hidden unemployment is growing, and the social sphere of the countryside is being destroyed. As a result, the average per capita consumption of food products by the population is significantly reduced.

So, if in 1990 the prices for the products of the agro-industrial complex only acquired a growth trend, but at the same time their relative parity remained, and prices for the main types of agricultural products grew at an outstripping rate, then in the early 90s of the last century the situation in the agro-industrial complex economy sharply changed, and by 1995 the price of industrial goods and services rose 4.2 thousand times, and for agricultural products - 1.2 thousand times, i.e. the price disparity was 3.0 times. After the August 1998 default, there has been a convergence in the growth rates of prices for agricultural products and resources for the countryside (Table 1).

*Table 1. Price indices for agricultural products and industrial services in agriculture of the Russian Federation (in% to the previous year)*

Indicators	Year									
	1991	2001	2010	2013	2014	2015	2016	2017	2018	2019
For agricultural products	163	335	136,5	105,6	117,7	109,6	104,3	110	114	115
Incl. crop production	191	287	162,5	113,9	129,6	98,4	104,6	116	121	122
Incl. animal husbandry	155	361	122,1	105,3	109,5	117,5	104,1	108,1	109	110
For industrial products and services consumed in agriculture	193	322	148,5	118,6	133,6	115,7	110,8	110,8	110	110
Index ratio	0,84	1,04	0,92	0,92	0,88	0,95	0,94	1,02	1,03	1,04

*Source: rosstat.gov.ru)*

The ratio of price indices for agricultural and industrial products has been approaching unity in recent years, and in 2018, for the first time in 10 years, the ratio of price indices turned out to be in favor of agriculture on average in the Russian Federation.

Price disparity has had a significant impact on the cost structure in agriculture. Share of material costs from 2001 to 2018 increased from 53% to 70.1%, and the share of wages decreased from 29% to 19.1%, energy resources increased 2.6 times, depreciation charges from 7% to 13%, other costs from 6% to 12%. Costs for seeds, feed, mineral fertilizers decreased by 1.5 times (Balatskiy, 2017).

As a result of the aforementioned reasons, the Russian agriculture found itself in a state of crisis. So, if in 1990 the share of profitable agricultural enterprises was 96% of the total, then in 2018 - 49%. Annual rates of production decline in all categories of farms during 1990-2018 accounted for 6-10% of the gross agricultural output [12].

Some scientists and practitioners believe that our agricultural production cannot be competitive in the world market, because extensive methods of developing agricultural production have been going on since the mid-70s. Significant resources were scattered for the development of new lands (1953-1960), which were used extensively. So, for the period 1951-1990. the sowing area of sugar beet has almost doubled, and the average yield for five-year periods did not reach 130 kg / ha. In Western Europe, during the same time, the sown area decreased by 2.5 times, and the yield exceeded 600 c/ha.

## Result

The insolvency of agricultural producers has become one of the main reasons for the reduction in the production of industrial enterprises associated with agricultural production, which led to the reduction and destruction of the domestic industrial base, undermining the national food independence [21]. Only in 1999-2000. there has been a slight increase in the production of tractors and agricultural machines, especially grain harvesters, due to the reconstruction and re-equipment of large combine plants in Russia using foreign technologies [4].

The provision of agricultural machinery remains below the level of developed countries. For comparison: in 1990 on US farms, on average, one tractor had 33 hectares of arable land, we have 92 hectares in 1990 and 187 hectares in 2018. The load on the combine harvester was 104 hectares, against 151 hectares in 1990 and 270 hectares in 2018. There were 1.3 tractors and almost one truck for every permanent employee in the United States, 0.137 tractors in the Russian Federation in 1990 and 0.11 in 2018 [12].

Due to a decline in agricultural production, a decline in household incomes, price disparity and, consequently, demand, production volumes in the processing industry have been decreasing since 1998, with the exception of vegetable oil and granulated sugar (mainly produced from imported raw sugar), as a result of the outstripping growth in prices for these types of products (table 2).

*Table 2. Production of the most important types of food in the Russian Federation, thousand tons*

Year	Meat and meat products	Animal oil	Whole milk products, million tons	Vegetable oil	Granulated sugar
1990	6629	833	20,8	1159	3759
2001	2416	421	5,4	802	3146
2010	493	267	6,2	1375	6076
2013	1677	285	8,5	1596	5846
2014	1698	271	8,7	1867	4852
2015	1827	254	9,5	2193	5588
2016	2185	268	10,0	2755	5833
2017	2215	271	9,8	2587	5940
2018	2346	265	9,7	2498	6032
2019	2504	274	10,0	2665	5983
2019 in% to 1990	37,8	32,9	48,1	230	159,2

*Source: rosstat.gov.ru*

It should be noted that in the context of a shortage of domestic sugar, imported raw materials and white sugar became the basis for the vast majority of processing enterprises and the population of the country. Due to the financial shortage, material and obsolescence of the means of production, domestic producers are not able to compete with imported food in the market, as a result the cost has sharply increased, the supply of sugar has worsened and its consumption has decreased.

According to statistics, since 1990, there has been a decrease in the average per capita consumption of more valuable types of food. So in 1995, the level of self-sufficiency in the main types of agricultural products fell to 72% for grain, up to 70% for meat, up to 88% for milk and up to 78% for sugar. In 2017, the level of self-sufficiency exceeded 100% for grain and potatoes, for meat it was 87.1%, for milk - 67.2%, for sugar - 97.6%. In general, over the years of an unstable economy in terms of food consumption, Russia dropped from 7th to 40th place in the world. As a result of an ill-conceived general economic policy and reforming the agrarian sector, the country moved from a state of partial food dependence for certain types of products to the loss of food independence. The share of imports amounted to more than one third of the country's total food stock.

The structure of the agro-industrial complex that has developed during the stagnant years does not fit into market conditions. The difference in production conditions in the regions of the Russian Federation, the level of development of productive forces, national and local traditions determines the multivariate approaches to the formation and effective functioning of the agro-industrial complex. It is obvious that the main priorities for the perspective, long-term and sustainable development of agro-industrial production should be:

- effective use of the existing production potential with the subsequent transition to an innovative development path, which involves a comprehensive modernization of the technical and technological base of agriculture based on the latest developments in science and practical achievements;
- the basis of effective organizational and economic models of agricultural production with a widespread transition from traditional organization to adaptive intensification of crop and livestock industries;

- the use of the latest models of organizing and conducting production, as well as balanced standards for the costs of material and technical means and labor resources in order to maximize production and profit per unit of resources used;
- improvement of territorial zoning, specialization and placement of crop and livestock industries according to the criterion of production optimality, use of land and labor resources, return on investment, development prospects;
- wide and predominant use of the advantages of concentration of agro-industrial production, which in agriculture will create a favorable environment for the use of industrial technologies, reducing unit costs, as well as expanded reproduction;
- introduction into practice of the principles of cooperation and integration of agro-industrial production. In the long term, almost all of the country's agriculture should be built on a cooperative-integration basis, implying close coordination of agricultural organizations with processing, marketing, trade, agro-service and financial-credit structures and enterprises, the creation on their basis of diversified and multi-type cooperative-integration structures, or so-called clusters by the type of financial and industrial groups, associations, unions, holdings, agro-industrial companies, corporations and forms;
- organization of agro-industrial enterprises of all forms according to the type of product associations, aimed at increasing the efficiency and competitiveness of production through the integration of efforts and resources, consolidation of investment and innovation development funds, and protection of corporate interests;
- formation of joint and mixed cooperative-integration structures with the participation of foreign firms and companies. This will allow the formation of national and transnational product companies and corporations that will have a wide access not only to the domestic Russian market, but also to leading foreign markets;
- re-specialization of agro-industrial production for consumer demand. The implementation of this priority will allow to more actively move away from production for the sake of production, more and more taking into account market demand and specific preferences of end consumers of food products;
- the focus of the country's agro-industrial production for export. Thus, food production in the country must be export-oriented and meet the requirements of international standards ISO-9000, 14000, HACCP, etc. Compliance with such requirements will allow the domestic agro-industrial complex to actively integrate into world agriculture, participate in the international division of labor, and become a stable supplier of quality products to leading foreign markets;
- creating conditions for the broad development of all forms of agricultural entrepreneurship and business through active support of the independence of commodity producers, the transition to self-government, self-management, self-sufficiency and self-financing;
- reproduction and restoration of highly professional human resources in agriculture, taking into account the requirements of modern times - the market, competition, entrepreneurship, commercial calculation and self-management;
- transition to a new system of motivation and stimulation of labor and production. The traditionally established practice of remuneration in agriculture, which is based on a tariff system with fixed categories and rates, has almost exhausted itself. In the best case, it can be used to pay the category of hired personnel, but only after significant improvement and, above all, an increase and differentiation of rates in connection with production results (Economics of organizations and industries).

## Discussion

It should be noted that today there is a massive influx of imported foodstuffs to the domestic market of Russia, as well as strong opposition to the export of Russian foodstuffs to foreign markets. Multinational food companies use all kinds of methods (including unfair competition) to consolidate their presence in the attractive Russian market. At the same time, the competition between suppliers becomes especially acute and is directly aimed at suppressing the weak and seizing their economic space [14].

All this indicates that it is possible and necessary to resist such phenomena by actions of a similar order - the creation in Russia of alternative powerful national and regional agro-industrial formations that would possess the necessary set of means and methods of competition and aggressively implement them, taking into account the laws of the market. At the same time, illegal administrative interference in their economic activities, the establishment of territorial and departmental barriers and restrictions on the purchase of raw materials and the sale of finished food should not be allowed. Cooperation and integration provide the participants of integrated associations with real opportunities to improve economic efficiency through the independent development and implementation of their business plans for the production, distribution and sale of products, the performance of work and the provision of services, as well as improving the social living conditions of their employees by increasing their material interest and security [15].

The development of agricultural cooperation provides for its formation in four main areas: cooperation at the enterprise level, inter-farm cooperation, territorial cooperation at the district and regional levels, interregional cooperation. To this end, within the framework of a specific regional food sub-complex (sugar beet), in parallel with the cooperation of agricultural enterprises, it is necessary to create associative formations of processing enterprises to combine material and financial resources, master rational technologies, etc. agro-industrial formations that promote vertical integration, combining agricultural production with processing, marketing, supply and agro-services [8].

The development of these areas is due to an objective economic process associated, on the one hand, with the social division of labor and its specialization, scientific and technological progress [16], natural and economic conditions, and on the other, with the need for interaction between specialized industries and types of agricultural and industrial production. Agrarian enterprises are joining this unifying movement, seeking to reduce the risk associated with production, its dependence on climatic conditions, the spontaneity of the agricultural market, the dictates of processing enterprises, the need to increase the competitiveness of production. Processing and service companies also strive to secure stable incomes due to the availability of a reliable raw material base, better use of raw materials, improving the quality of their products, making them cheaper and winning markets [10].

The choice of this or that form of integration depends on the production and economic situation in the region, the state of the food market, the forms of pooling capital and their participation in management, the capabilities of the parent enterprise, but regardless of the chosen form for all agro-industrial formations, the main thing is that they combine the entire reproductive process, from an agricultural producer to a consumer of finished products.

## Conclusion

Thus, the priority direction of ensuring Russia's food independence is overcoming the crisis of agro-industrial production based on the formation of effective market structures and mechanisms with effective state management of the economy through economic levers - taxation, pricing, lending, creating a system where the fullness of economic responsibility for the implementation of their business plans would fall on business entities. To do this, it is necessary to use internal factors of stabilization and growth in the agro-industrial complex itself: they fully include structural transformations.

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# THE ROLE OF ECOLOGICAL BEHAVIOR AND ECOLOGICAL CULTURE IN DEVELOPMENT OF MODERN URBAN ENVIRONMENTAL SAFETY SYSTEM

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## Abstract

Relevance of the matter is determined by the need for theoretical understanding of youth environmental behavior and environmental culture as essential factors of development in modern urban environmental safety system. The purpose of this research is to analyze the concepts of youth environmental behavior, environmental culture and specifics of their interpretation in improving environmental safety system of modern urban civilization. The article deals with the framework of sociological theory of social action and interdisciplinary sociocultural approaches to the research problem. The article reveals theoretical and methodological approaches in the study of modern urban environment ecological safety, it conceptualizes ecological culture and environmental behavior of youth; identifies and analyzes youth environmental practices in modern cities, such as environmental consumption, volunteer movements in the sphere of ecology, environmental and educational activities, social activity and projects aimed at implementation of youth environmental projects. The article considers some trends and future prospects for development of environmental education as an important condition for youth environmental practices in the context of formation of a sustainable urban environmental safety system. The materials of this article can be used as a basis for further research in the field of formation of youth ecological behavior and ecological culture, being instrumentalized in relation to sustainable and effective environmental safety system of modern cities.

**Keywords:** Environmental Behavior, Environmental Culture, Youth, Environmental Education, Urban Environmental Safety

JEL: Q56

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## Introduction

The modern urban civilization faces serious environmental challenges that urgently require environmental safety and ecological culture. Environmental behavior and environmental culture of young people play a special role in these processes. The modern urban spaces (especially metropolises) are becoming the "centers of attraction" for youth as for the most active social stratum that seeks to realize its innovative potential in the space of big cities. It is obvious that youth environmental behavior to a greater extent becomes the most important development factor of urban environment and its environmental safety system.

At the same time, it should be noted that the problem of ecological behavior and ecological culture of youth in the conditions of the modern urban civilization, as well as the problem of urban ecology and environmental safety, is not only relevant, but relatively new and poorly studied as well. In this regard, there is a need for theoretical analysis of the main concepts, such as environmental safety, environmental behavior and environmental culture of youth. We shall deal with theoretical and methodological approaches to study this problem.

They shall identify and analyze the features of youth environmental practices in conditions of modern urban space, since these practices may act as an important component in the system of ensuring environmental safety of cities. In this regard, we cannot ignore the problem of environmental education, which forms ecological culture and environmental behavior of youth.

## Methodological Framework

The study of youth ecological behavior and ecological culture in the context of urban environmental safety system is largely interdisciplinary in nature and requires an appeal to human sciences and theories, primarily such as sociology and social philosophy.

In this study, we relied on the theoretical and methodological approach presented in sociological theory of social action [18], which allowed us to conceptualize environmental behavior of young people. To understand the ecological culture of youth, we also utilized the sociocultural approach in order to treat the specifics of ecological culture in the context of value attitude of social subjects to the environment [19; 20; 3]. In this study we also take into account the ideas of modern researchers who emphasize the essential role of social and cultural factors in shaping environmental behavior [15; 16].

In general, these methodological approaches allow us to reveal opportunities for studying various environmental practices of modern youth aimed at solving environmental problems of a modern city and forming a system of environmental safety. Such a framework also allows to identify the field for further research and discussions on the problem of environmental education as a factor in formation of mature environmental culture and environmental behavior of youth.

## Results

### *Environmental Safety, Environmental Behavior and Environmental Culture: Theoretical and Methodological Approaches*

It should be noted that the concept of environmental safety appeared in the 70s and 80s of the twentieth century to understand the growing environmental problems and ways to solve them. In modern scientific research, environmental safety is considered by several approaches. It is commonly treated as a "sustainable state" of social, technical and natural systems – a state, that implies "optimal integration" of human activity into the "natural processes of natural environment" [14].

Activity-based and system-based approaches to social security research should be highlighted specifically. Thus, within the framework of activity approach, environmental safety is treated as a system of measures, aimed at establishing balance between human activity and nature.

The systematic approach seems to be very effective for methodological study of environmental safety as an integral system that includes a number of elements: political, economic, legal, technological, and cultural. In their entirety these elements are aimed at protection of biosphere and sociosphere from natural and human threats or risks. And if the city is treated as a complex social ecosystem, then the elements of this system should support its sustainable development and environmental safety [12; 13].



The most important environmental safety concepts are environmental behavior and environmental culture. If environmental behavior is treated in the context of sociological theories of social behavior, then youth environmental behavior can be defined as a form of social behavior that includes a number of social actions [21; 22]. In relation to environmental behavior, the well-known classification of social actions by M. Weber (2014) allows to discuss the goal-oriented, value and rational, traditional and affective social actions.

In turn, environmental behavior implies formation and development of environmental culture, with such a feature as "value dimension". Scientists developed different approaches to environmental culture: activity-based, personal, "environmental", and "perspective of sustainable development" [5]. In the process of formation and development of environmental culture, it is essential to form environmental awareness and thinking, environmental responsibility, and environmental education, as well as "readiness for environmental activities, reasonable use of natural resources, motivation and sustainable needs" [1]. All these aspects emphasize the ambiguity of "ecological culture" concept [11].

In general, ecological culture refers to the value attitude of a person to the environment. O.N. Yanitsky (2005) notes, that ecological culture can be described as "the value attitude of a certain social subject (individual, group or community) to its environment: local, national or global. A person is able to form this attitude in the course of practical development of the world (cognitive, economic, educational and other practices). It is fixed in normative value systems and implemented in actions of social subjects and institutions" (p. 136-137). Accordingly, the ecological culture of youth can be treated as their value attitude to the environment, its important part being the urban space.

### *Environmental Behavior of Youth: Essential Practices in a Modern City*

Environmental behavior of young people is implemented through a number of practices that can serve as a system of modern urban space environmental safety. Among these practices, the main ones are as follows: environmental consumption, volunteer movements in the field of ecology and environmental protection, educational and awareness activities, social activities and projects aimed at creating and implementing youth environmental projects.

The youth consumption trend becomes significantly "ecocentric". Some young people seek to identify themselves with representatives of the so-called "creative class". To a greater extent, these young people are most susceptible to environmental consumption practices. These practices, first of all, are aimed at choosing "eco" goods and products. They focus on goods and services by manufacturers with attractive environmental image. At the same time, the practice of ecological consumption is significantly related to the interests of modern urban young people in healthy lifestyle and rejection of motor transport in favor of bicycles and electric scooters.

Youth volunteer movements in the field of ecology are an important environmental practice as well. Taking part in various volunteer movements, young people become a subject of environmental activities and projects. Moreover, these activities are closely linked to educational and awareness-raising activities aimed at creation of environmental culture and promotion of respective lifestyles and behavioral strategies (including "healthy lifestyles"), which can be very attractive to young people. It is not only about the youth belonging to "creative class" and wealthy segments, but about all those young people who accept and "promote" ecological values.

Reduction of youth deviant behavior risks is an important and positive effect of "integrating" young people into environmental practices, including volunteer movements and projects. In this sense, environmental practices become an important social technology for general social support and prevention of youth deviant behavior.

It should be emphasized that the young people aimed at environmental safety and monitoring environment in their own city or urban area are willing to cooperate in solving urgent environmental problems. Thus, environmental practices involving joint participation in various projects and events form their collective responsibility and ability to act in solidarity. The common environmental safety interests of the city serve as a serious incentive to social solidarity of the young people involved in environmental practices.

There is a need to feature creation and implementation of youth environmental projects, which can be diverse in content and form. Thus, such projects may serve as educational events for schoolchildren and students of higher educational institutions. These events can be held in the form of educational lectures, seminars, panel discussions and practical conferences dedicated to the most important issues of urban environmental protection. Such effective projects may also include youth competitions: for example in social environmental advertising or some special competitions for the leaders of youth environmental movements. Such projects both attract young people's interest in environmental issues and contribute to development of environmental safety system of the modern cities.

### *Environmental Education: Development of Youth Ecological Culture and Urban Environment*

Scientists state, that one of the most important preventive factors in the field of environmental safety is the raise of environmental education level and culture of population (in particular - of the youth) [6]. The effectiveness of environmental education as a factor of environmental safety (including the urban environment) largely depends on the readiness of youth to support the environmental practices. In other words, it is necessary to take into account the needs of young people in environmental practices, as well as the level of their general interest in environmental issues.

The concept of environmental education was first proposed in 1970 at a conference in Carson City. Environmental education, as noted by I.D. Butova (2008) [4], is understood as a "continuous process of training and education aimed at forming a common environmental culture and environmental responsibility of each inhabitant of the planet. Environmental education is based on scientific basis and covers most of the school subjects".

It is necessary to identify and analyze the essential characteristics of this definition. First, there is a continuity of educational process, build on scientific base and main school subjects. Second, there is the concept of environmental responsibility. Continuity of environmental education is a consistent (step-by-step) process of mastering basic environmental knowledge. In this context, environmental education allows young people to appreciate environmental problems at the level of their own city and contribute to solve many of them. Another thing is that basic environmental knowledge does not allow to solve, for example, the problems of industrial pollution which require contribution of the specialists and, accordingly, fall within the competence of professional environmental education [8; 9].

Another characteristic of environmental education is environmental responsibility. It seems that this concept is universal, since it applies to any form of human relations (domestic, industrial, etc.) with the environment. Environmental responsibility is a form of human attitude to the world. It implies developed environmental culture, which, in turn, prevents us not only from environmental crimes but even from minor "environmental mistakes".

It can be said, that environmental responsibility of youth should include some essential points: the basic understanding of ecosystems, "ecological picture" of the world, methods of monitoring (global, national and local and, primarily, at the level of cities and urban areas). Young people should also have the knowledge of "shared house ecology", which involves relationships between the people living "next door" and solving current environmental problems in the field of local ecology together.

An important aspect of urban environmental responsibility is the ability to share it between local communities (including the youth) as representatives of civil society, which regulate the environmental situation on the ground and local municipal authorities. Such a delegation of environmental responsibility is necessary when the problem can not be solved by efforts of the local community.

Sociological studies show, that urban youth is very concerned about environmental problems, and first of all, about the problem of environmental pollution, so characteristic of a modern cities, especially of metropolises. Researchers state, that the following environmental problems cause the greatest concern among students: air pollution (21%); radio-contamination (19%); climate change (11%); contamination of water (11%); motor vehicle pollution (10%) [17]. It is quite understandable that young people wait for the city officials to provide them with the necessary assistance in solving environmental safety problems. The most effective solution can be found in a developed urban community with significant potential for self-government. In addition, in the city space (and above all, in metropolis), there are all the necessary conditions for organizing and supporting various youth movements and initiatives aimed at protection of the environment and drawing attention to environmental problems [21; 22].

However, it should be noted that the process of educating young people about environmental responsibility is often faced with excessive bureaucratization. For example, to fight household garbage on the side of a roadway they need to contact their city services (local administration, road services, City Improvement Department, etc.). As a result, the residents who delegated this problem to the level of municipal authorities get no full-fledged solution to the problem, but various kinds of bureaucratic documents instead (the problem is either put on the queue or is listed as intractable).

It should be emphasized that such a kind of attitude to environmental initiatives of the local authorities negatively affects the level of youth environmental culture formed in the process of education and upbringing. Therefore, within the attitudes of youth, formed by environmental education, there may be a contradiction between environmental theory and practice of solving environmental problems.

## Discussions

The noted contradictions between environmental attitudes of youth and practice of solving environmental problems at the local level sets a problematic field for further discussions. "Environmentally educated" young people can legitimately expect the bureaucracy to respond to environmental problems. However, the bureaucratic system, due to its nature, is not able to fully and adequately respond to requests of the citizens, creating a situation of certain

distrust. Lacking administrative capabilities, civil society is forced to take a kind of passive side in environmental issues dialogue with bureaucratic system. In their turn, bureaucratic structures are often satisfied with formal document management, rather than real actions and measures to eliminate the environmental problem.

That is why young people may lose confidence in environmental education and treat it as an unnecessary school subject that overloads their educational process. This brings up an issue of the need for environmental education. Such a problem is often caused by the contradiction between theory of humanistic environmental education and the everyday practices of bureaucratic structures. In this regard, there is an urgent need to establish a certain coherence between the institute of education and administrative structures. They need a constructive dialog and interaction on environmental education.

At the same time, the problem of youth urban ecological culture development cannot be solved only by introduction of administrative control. There is a need for a flexible state youth policy, consistent with the needs of youth and able to support socialization and cultural development of young people. At the same time, development of ecological culture should be based on previous achievements of human culture, which young people should creatively master and transform. This development of cultural achievements and universals is facilitated by environmental education, which is necessary at all the levels of educational process. In its core, the educational process should be based on humanistic values (Kolesnikova et al., 2019; 2).

In other words, "ecohumanistic" behavior of modern youth is impossible without the main cultural universals, assimilated in the process of socialization and inculturation. Moreover, a significant part of this process coincides with the period of training and education. In this regard, it is very promising to develop the existing practice of creating and introducing into the educational process (first of all, of higher educational institutions) such subjects as "Environmental culture", "Social Ecology" [6] and some others. Ultimately, ecohumanistic education is an important factor in sustainable development of the modern society [10].

## Conclusion

In this study we identified and conceptualized the features of youth environmental behavior, youth environmental culture and their significance in formation of a sustainable environmental safety system of modern urban space. At the same time, ecological behavior was considered as a special form of social behavior that includes social actions from the point of view of sociological theory. In its turn, youth ecological culture acts primarily as a value attitude of the younger generation to the environment (including the urban environment). Environmental culture of young people as a value attitude includes such components as environmental thinking and environmental education, readiness for environmental activities and environmental responsibility.

Exploring the features of youth environmental practices in urban environment as components of environmental behavior, we paid special attention to the problems of environmental consumption and education, as well as to volunteer activities, organization of environmental events and development of youth social design.

Thus, the study identified "ecocentric" trends in behavior of urban youth associated with interest in healthy lifestyle and practices of "eco-friendly" products consumption. It is a very significant practice to involve young people in volunteer movements aimed at environmental protection. This practice also serves as a means of social support, including technologies for preventing youth deviant behavior. In the course of solving urgent environmental problems (including support of environmental safety in their own cities), youth volunteering acts as a technology that forms social solidarity.

Environmental education is a fundamentally important aspect of formation of youth ecological culture and a factor of urban environmental safety. It presumes the need to get basic environmental knowledge and environmental responsibility. An important aspect of such a responsibility is the ability to distribute and delegate it between the youth community and municipal authorities. However, there may appear a contradiction between humanistic theories of environmental education and the actual bureaucratic practice of administrative structures. In this regard, the key to young people's confidence in environmental education is found in constructive interaction between the institute of education and municipal authorities in the field of environmental safety of urban environment.

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## MODELING HUMAN CAPITAL DEPENDENCE AND PRODUCTION WITH A HIGH LEVEL OF AUTOMATION

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### Abstract

Improving efficiency through automation is one of the directions of production development. But the use of automated tools does not always give the desired effect. Much depends on market conditions and the cost of modernizing production. An important issue is the use of technologies, in which, with the help of mechanization and automation, labor resources are freed, as well as the level of their equipment with technical means increases, especially in the conditions of application of artificial intelligence. This article proposes to consider the issue of the feasibility of the enterprise's transition to the production of products, the production of which has a higher degree of mechanization, automation or robotization in comparison with the manufactured products.

**Keywords:** Mechanization, Automation, Robotization, Human Capital, Artificial Intelligence

JEL: O30

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## Introduction

The prospects for the development of society are determined by the degree of use of human capital. For the state, the degree of use of human capital is determined both by the development of human capital of the country itself, and the possibility of attracting human capital from outside. At the present stage, the main thing for Russia is the development of human capital within the country. The use of external capital is limited by the level of development of the country's economic potential. The article examines the degree of influence of production factors on human capital. The influence of both individual main factors and the influence of several factors in their interaction is considered.

## Methodology

The analysis of the influence of production factors will be carried out using the relationship between the main factors of production and human capital, as well as the relationship between the interaction of the main factors and the development of human capital. Based on the established relationships, we will consider the trends in the development of capital through the prism of the development of production factors.

In the process of research, systemic, structural-functional, comparative and other research methods are used.

For the purpose of mathematical modeling, the mathematical method of linear programming was used in the article and the theory of duality is applied.

## Results

In economics, there are five main factors of production: Land, Labor, Capital, Entrepreneurship and Information. The development of production is associated with the development and interaction of these five factors. Of the five main factors of production, Labor, Entrepreneurship and Information have a direct connection with human capital. Moreover, information has a direct connection as a source of knowledge, intended specifically for a person, as the basis of human capital. Land, Capital are directly related to human capital.

In addition to the main factors of production, interactions of factors also have an impact. This interaction can be two, three or four factors, if we take the factor of entrepreneurship out of the bracket, as factors that determine the interaction of the remaining four factors [12; 31; 33].

Thus, a sequence of analysis of the influence of the main factors, the interaction of two factors, the interaction of three factors and the interaction of four factors is proposed. In this case, the participation of the Entrepreneurship factor is assumed.

The earth is a factor with which a person is connected on the one hand directly, and on the other indirectly, through interaction with other factors. First of all, a person lives on Earth and is a consumer of its resources. This is the first level of development of human capital as a consumer and subject of the production process. Secondly, the use of the Earth as an object of economic activity presupposes the development of man as a participant in the distribution of the natural resources available to the Earth. Here I mean not only as a consumer, but also as a subject who is ready to use natural resources in the production sphere [5-7]. This determines the influence of the Entrepreneurship factor on human capital. A person, as an entrepreneur, uses natural resources to obtain his own benefits: rent, profit, income.

Labor, as a factor, directly affects human capital. The skills and level of use of their physical, intellectual capabilities and the degree of their development determine human capital. The level of development of human capital should be sufficient to use it as a labor force, labor resources.

Capital also has an indirect effect on human capital. Here we can consider the influence of capital as a factor in the development of the entrepreneurial abilities of a person who uses financial instruments to realize his goals and objectives in the economic sphere.

Information at the current stage of development is primarily associated with the level of knowledge that a person has and the degree of use of information both in the production sphere and in other spheres of social activity [11; 13; 14; 22]. Again, considering knowledge and the degree of awareness in entrepreneurship determines the degree of development of entrepreneurship as a factor of production.

The influence of factors of production in their pairwise interaction increases the level of development of human capital.

So, the interaction of the factors Earth and Labor increases the level of human skills as a subject of the production process. Not only does it combine the separate influence of both factors of production, but also complements the skills associated with the interaction of the factor Land and factor Labor. The effects on human capital of other pairs of factors of production are similar: Land-Capital, Land-Information, Labor-Capital, Labor-Information and Capital-Information.

When considering the impact of entrepreneurship on human capital, we note that the level of entrepreneurial activity itself is also higher. Let's pay attention to the higher level of human capital development as a subject of economic activity. An even higher level of human capital development under the influence of the interaction of three factors [24-27; 37].

With this interaction, it should be noted that the level of human capital development, even without taking into account the influence of the Entrepreneurship factor, is significantly higher than with the interaction of two factors. With the level of human capital capable of ensuring production with the interaction of three and four factors, there are reserves for development [21]. Basically, at the present stage, they are associated with the influence of the Information factor on the production process, which in turn requires a high level of human capital development.

Numerous articles dealt with issues related to the training of personnel in agriculture, where planning and training of personnel are considered based on forecasts of the development of human capital in agriculture. This approach to analyzing the influence of production factors can be used for such planning.

Let's especially highlight the influence of such a factor as artificial intelligence. As a factor of production, it is a competitor to human capital. This is a significant difference from other factors. The fact is that with the advent of artificial intelligence, the main purpose of production changes - production for human consumption. This means that the very fact of production in its original understanding may be in doubt. This will lead both to a disaster in the production sphere and in the humanitarian sphere, since the person will not become the basis of the main activity. Artificial intelligence will be the basis.

Therefore, the use of artificial intelligence as a factor of production must be accompanied with special restrictions. First of all, artificial intelligence should not take part in the distribution of manufactured products. Secondly, a person should not be excluded from production management and the degree of his control should not be lower than the safety level of both production itself and the degree of its restoration [1-4; 10]. Both reasons require special restrictions on the use of artificial intelligence for the Entrepreneurship factor.

Summing up, we would like to note that the level of development of production factors requires an appropriate level of development of human capital. Factors of production affect human capital both directly and indirectly. The indirect influence is explained by the presence of the Entrepreneurship factor in the production process [17; 20; 22]. The degree of development of human capital and the need for it corresponds to the level of involvement of production factors, the more factors are involved in production, the higher the degree of human capital development.

Artificial intelligence is a special factor of production. It is not only a competitor to human capital, but also a factor that can both change the goals of production and destroy the production sphere itself. The factor should not affect the factor Entrepreneurship above the level of safety in production management and distribution of production products [17-20; 30-33].

Human capital as an economic category expresses the economic relations that develop in society at a certain stage of its development. The economic definition is very "young" and arose only 100 years ago during the Soviet period, when people were considered as a separate kind of resource. Up to this point, the use of mental and physical labor was interpreted only by the concept of "labor resources".

For an effective assessment of the formed human capital, it is necessary to assess the quantitative and qualitative component of labor resources. The quantitative characteristics include the number and professional composition of the organization's employees. It should be noted that the number and composition of the organization's workforce also depends on the scope of the organization, as well as on the technical and technological indicators of the use of digital technologies in the production process [27-29; 32]. If we consider the management of employees at the level of the organization, then the actual human potential is the property of the production organization, as a resource that must be effectively used to achieve goals.

To assess the effectiveness of using human capital, the following indicators are assessed:

- quantitative provision, in terms of number, composition, structure, skill level; establishment of the conformity of the professional staff and the level of qualifications of workers to the production requirements;
- characteristics of the movement of labor - the study of the forms, dynamics and causes of movement of labor, analysis of the influence of the number of employees on the dynamics of production;
- use of the fund of working time - development of measures for the best use of working time and elimination of its unproductive costs;
- analysis of the payroll;

- analysis of the effectiveness of the use of the payroll [15].

The authors of the article carried out an analysis of the provision of the agricultural industry with specialists, which confirms the fact that the industry is experiencing serious personnel problems that significantly affect the final financial results.

*Table 1. Composition and structure of the provision of the agricultural sector of the Novosibirsk region with the main specialists in 2018, people*

Categories of workers	Have a professional education						Do not have specialized education		demand	% provision
	higher		average		Total with specialized education		quantity	%		
	quantity	%	quantity	%	quantity	%				
Chief specialists - total	<b>684</b>	<b>62,4</b>	<b>349</b>	<b>31,8</b>	<b>1033</b>	<b>94,3</b>	<b>63</b>	<b>5,7</b>	<b>251</b>	<b>81,4</b>
Chief agronomists	109	80,7	25	18,5	134	99,3	1	0,7	44	75,4
Main zootechnicians, incl. ch. breeders	86	67,2	32	25,0	118	92,2	10	7,8	35	78,5
Chief Veterinarians	89	65,9	41	30,4	130	96,3	5	3,7	44	75,4
Chief engineers of all specialties (mechanics, technologists, heating engineers, etc., except for construction and hydraulic engineering, power engineers and electricians)	88	46,3	79	41,6	167	87,9	23	12,1	38	83,3
Chief power engineers and electricians	39	39,8	42	42,9	81	82,7	17	17,3	22	81,7
Chief economists (heads of planning, economic departments)	78	77,2	23	22,8	101	100,0	0	0,0	44	69,7
Chief accountants (heads of accounting and financial departments, financial directors)	166	60,4	102	37,1	268	97,5	7	2,5	21	92,9
Other positions of chief specialists	29	85,3	5	14,7	34	100,0	0	0,0	3	91,9

*Source: [8; 9; 16]*

The analysis showed that the average level of provision of the agricultural sector with specialists stopped at 91.5%. This indicator, over the past several decades, has had an unstable dynamics, and in 2015 it was 68%. On the face of it, there are positive changes in the improvement of the personnel situation, but if you look at the age composition of employees, there is a professional aging of employees, which has an extremely negative effect on the ability to master digital technologies and platforms (Table 2) (Kuznetsova et al., 2019).

An analysis of the age structure of chief specialists also shows that in the industry, 14% are workers of retirement age, and 5% are workers under the age of 30. In total, the group of young specialists and chief specialists makes up 19% of the total number.



Table 2. Age composition of the main specialists in the agricultural sector of the Novosibirsk region

Categories of workers	Total employees	Up to 30 years		Over 55		Total (up to 30, + over 55)	
		quantity	%	quantity	%	quantity	%
<b>Chief specialists - total</b>	<b>1096</b>	<b>58</b>	<b>5</b>	<b>153</b>	<b>14</b>	<b>211</b>	<b>19</b>
Chief agronomists	135	9	7	18	13	27	20
Main zootechnicians, incl. ch. breeders	128	9	7	14	11	23	18
Chief Veterinarians	135	8	6	11	8	19	14
Chief engineers of all specialties (mechanics, technologists, heating engineers, etc., except for construction and hydraulic engineering, power engineers and electricians)	190	10	5	26	14	36	19
Chief power engineers and electricians	98	3	3	9	9	12	12
Chief economists (heads of planning, economic departments)	101	8	8	15	15	23	23
Chief accountants (heads of accounting and financial departments, financial directors)	275	8	3	50	18	58	21
Other positions of chief specialists	34	3	9	10	29	13	38

Source: [8;9;16]

Consider an enterprise that manufactures two types of products using two scarce resources: labor and equipment. We assume that the level of technical means of labor resources in the production of the second type of product is higher than in the first.

Let us pose the question of the expediency of the enterprise's transition to the production of products of the third type, if the level of equipment with technical means for it is higher than that of the second type.

The solution to this problem will make it possible to determine the conditions when it is profitable for the enterprise to modernize and replace the output of products with a lower level of equipment with means of production, products with a higher level [17; 23-25].

The solution to the problem posed will be carried out by representing the output in the form of a problem on the optimal use of resources. Therefore, the solution will be based on mathematical modeling of economic problems. Mathematical modeling of resource consumption in production involves the construction of a linear programming problem to solve the problem. This means that linear programming techniques will be used. To analyze the efficiency of the use of resources and production of products, the analysis technique of the theory of duality is applied [34-37]. To determine the conditions for the transition to the production of products of a higher level of equipping labor resources with means of production, let us consider the problem of the optimal use of two resources for an enterprise that produces three types of products. Such a task adequately describes the process of resource consumption, on the assumption that labor resources and means of production in the form of equipment are scarce resources, and the rest are not [39].

The enterprise manufactures three types of products  $A_1$ ,  $A_2$ ,  $A_3$  using two types of resources:  $R_1$  – labor resources and  $R_2$  – equipment.  $A_1$  production unit requires  $a_{11}$  man-hours of  $R_1$  and  $a_{21}$  hours of resource  $R_2$ ,  $A_2$  requires  $a_{12}$  man-hours of  $R_1$  and  $a_{22}$  hours of resource  $R_2$ ,  $A_3$  requires  $a_{13}$  man-hours of  $R_1$  and  $a_{23}$  hours of  $R_2$ . Income from the sale of a unit of production  $A_1$  is  $c_1$  rubles, unit of production  $A_2$  –  $c_2$  rubles, unit of production  $A_3$  –  $c_3$  rubles. It is necessary to draw up such a plan for the production of  $A_1$ ,  $A_2$  and  $A_3$ , products so that with a reserve of resource  $R_1$  in the amount of  $b_1$  man-hours, resource  $R_2$  in the amount of  $b_2$  hours, the income of the enterprise would be maximum [16].

In the event of a shortage of labor resources and equipment, the costs of their use in production will be constant. Therefore, the profit of the enterprise can be considered as an indicator of efficiency. The optimal plan with the maximum income will be optimal for the profit of the enterprise.

To build an economic and mathematical model, by default, we assume that the quantities of products  $A_1$ ,  $A_2$  and  $A_3$  will be non-negative, the indicator of efficiency is the company's income, which can be expressed through the income from the sale of units of products  $A_1$ ,  $A_2$  и  $A_3$ .

Let us denote by  $x_1$  – the quantity of  $A_1$  products,  $x_2$  – the quantity of  $A_2$  products,  $x_3$  – the quantity of  $A_3$  products.

We make a restriction on the use of labor resources - resource  $R_1$ :

$$a_{11}x_1 + a_{12}x_2 + a_{13}x_3 \leq b_1. \quad (1)$$

Restriction on the use of equipment - resource  $R_2$ , will look like:

$$a_{21}x_1 + a_{22}x_2 + a_{23}x_3 \leq b_2. \quad (2)$$

By default, we assume that

$$x_1 \geq 0, \quad x_2 \geq 0, \quad x_3 \geq 0. \quad (3)$$

As an objective function, we choose  $Z$  - the company's income. Then the income of the enterprise is

$$Z = c_1x_1 + c_2x_2 + c_3x_3 \quad (4)$$

and should strive for the maximum. We get an economic and mathematical model of the original problem:

$$\begin{cases} a_{11}x_1 + a_{12}x_2 + a_{13}x_3 \leq b_1 \\ a_{21}x_1 + a_{22}x_2 + a_{23}x_3 \leq b_2 \\ x_1 \geq 0 \quad x_2 \geq 0 \quad x_3 \geq 0 \end{cases} \quad (5)$$

$$Z = c_1x_1 + c_2x_2 + c_3x_3 \rightarrow \max$$

We formulate the dual problem similarly:

$$\begin{cases} a_{11}u_1 + a_{21}u_2 \geq c_1 \\ a_{12}u_1 + a_{22}u_2 \geq c_2 \\ a_{13}u_1 + a_{23}u_2 \geq c_3 \\ u_1 \geq 0 \quad u_2 \geq 0 \end{cases} \quad (6)$$

$$W = a_{11}u_1 + a_{21}u_2 \rightarrow \min$$

Let's determine the indicators of resource consumption for each type of product.

The armament of labor resources is defined as the ratio of the time of use of equipment per unit of production to the productivity of labor resources in the production of a given type of product.

The time of using equipment per unit of production is equal to the coefficients of the model  $a_{2j}$ , where  $j=1, 2, 3$ . The productivity of labor resources is determined by the coefficients of the model  $a_{1j}$ , where  $j=1, 2, 3$ . The values of the parameter are denoted by  $\beta_j$  and they are calculated by the formula:

$$\beta_j = \frac{a_{2j}}{a_{1j}}, \quad (7)$$

where  $j=1, 2, 3$ .

We will assume that the products are numbered in ascending order of the parameter  $\beta_j$ , which means that the double inequality holds:

$$\beta_1 < \beta_2 < \beta_3. \quad (8)$$

This follows from the fact that in the formulation of the problem, products are ranked according to the armament of labor resources: the lowest indicator for  $A_1$  production, the highest for  $A_3$ . Let us determine the indicator for the enterprise, which determines the total armament of labor resources, as the ratio of the total time of equipment use,  $b_2$ , to the total number of labor resources that can be employed at the enterprise,  $b_1$ . This is the total armament of labor resources at the enterprise, we denote it  $\beta$ . It is equal to:

$$\beta = \frac{b_2}{b_1}. \quad (9)$$

Let's take a look at another indicator of resource utilization. This is the ratio of resource consumption per unit of production  $A_s$  to resource consumption per unit of production  $A_j$ . This relative indicator shows the degree of resource use by type of product. We denote it  $k_{js}^{(i)}$ , где  $i=1, 2; j<s; j=1, 2; s=2, 3$ . For labor resources, we define the indicator of the relative consumption of labor resources in the production of products  $A_2$  to products  $A_1$

$$k_{12}^{(1)} = \frac{a_{12}}{a_{11}}, \quad (10)$$

as well as the relative consumption of labor resources in the production of products  $A_3$  to products  $A_1$

$$k_{13}^{(1)} = \frac{a_{13}}{a_{11}}. \quad (11)$$

We define the same indicators for equipment: the relative consumption of equipment in the production of products A<sub>2</sub> to products A<sub>1</sub>

$$k_{12}^{(2)} = \frac{a_{22}}{a_{21}}, \quad (12)$$

and the relative consumption of equipment in the production of A<sub>3</sub> products to A<sub>1</sub> products

$$k_{13}^{(2)} = \frac{a_{23}}{a_{21}}. \quad (13)$$

The next metric will be the relative revenue ratio for the output. This is the ratio of product performance indicator A<sub>2</sub> to product performance indicator A<sub>1</sub>:

$$k_{12} = \frac{c_2}{c_1}, \quad (14)$$

and also the ratio of the product performance indicator A<sub>3</sub> to the product performance indicator A<sub>1</sub>:

$$k_{13} = \frac{c_3}{c_1}, \quad (15)$$

If condition (8) is satisfied, then the following statement is true for the exponents  $k_{js}^{(i)}$  :

$$k_{js}^{(1)} \leq k_{js}^{(2)}. \quad (16)$$

Table 3 shows the optimal production plans for two types of products (Table 3).

Table 3. Optimal production plans in the problem of the optimal use of two resources for two types of products.

	$\beta < \beta_1$	$\beta_1 < \beta < \beta_2$	$\beta > \beta_2$
$k < k_1$	$(n_{21}; 0)$	$(n_{11}; 0)$	$(n_{11}; 0)$
$k_1 < k < k_2$	$(n_{21}; 0)$	$(n_{11} \cdot \frac{\beta_2 - \beta}{\beta_2 - \beta_1}; n_{12} \cdot \frac{\beta - \beta_1}{\beta_2 - \beta_1})$	$(n_{12}; 0)$
$k > k_2$	$(0; n_{22})$	$(0; n_{22})$	$(n_{12}; 0)$

This table uses indicators  $n_{ij}$ , where  $i=1, 2, j=1, 2$ . They are calculated by the formula:

$$n_{ij} = \frac{b_i}{a_{ij}}. \quad (17)$$

where  $i=1, 2, j=1, 2$ . The indicator  $n_{ij}$  is equal to the maximum amount of production A<sub>j</sub> that can be obtained using the entire resource stock R<sub>i</sub>.

The main question in the article is the search for conditions for the release of A<sub>3</sub> products for an enterprise that produces two types of products A<sub>1</sub> and A<sub>2</sub>, if labor resources and equipment are scarce resources. This means that in the pair of dual problems (5) - (6), the optimal designs satisfy the conditions:

$$x_1^* > 0, \quad x_2^* > 0, \quad (18)$$

$$u_1^* > 0, \quad u_2^* > 0. \quad (19)$$

According to the data presented in Table 3, the model indicators  $\beta$  and  $k_{12}$  must satisfy the conditions:

$$\beta_1 < \beta < \beta_2, \quad (20)$$

$$k_{12}^{(1)} < k_{12} < k_{12}^{(2)}. \quad (21)$$

The optimal plan in the direct problem is the extended plan:

$$X^* = (n_{11} \cdot \frac{\beta_2 - \beta}{\beta_2 - \beta_1}; n_{12} \cdot \frac{\beta - \beta_1}{\beta_2 - \beta_1}), \quad (22)$$

$$Y^* = (0; 0), \quad (23)$$

$$Z_{max} = c_1 \cdot n_{11} \cdot \frac{\beta_2 - \beta}{\beta_2 - \beta_1} + c_2 \cdot n_{12} \cdot \frac{\beta - \beta_1}{\beta_2 - \beta_1}. \quad (24)$$

We assume that the enterprise produced two types of products and conditions (8), (20) - (21) were satisfied, that is, both types of products were produced and both resources were in short supply.

We are considering the feasibility of releasing a third type of product. As a reference, we take the plan (22) supplemented to the production plan of three types of products, we denote it  $X_{12}^*$ :

$$X_{12}^* = \left( n_{11} \cdot \frac{\beta_2 - \beta}{\beta_2 - \beta_1}; n_{12} \cdot \frac{\beta - \beta_1}{\beta_2 - \beta_1}; 0 \right). \quad (25)$$

For two types of products, the optimal solution to the dual problem is.

Let's define more indicators of the efficiency of resource use.

As such an indicator, consider the assessment of a given resource in the production of a unit of a given type of product, let us denote it as  $p_{ij}$ . It is determined by the formula:

$$p_{ij} = \frac{c_j}{a_{ij}}, \quad (26)$$

where  $i=1, 2, j=1, 2, 3$ .

According to the introduced designation, it will take the form:

$$U^* = \left( p_{11} \cdot \frac{k_{12}^{(2)} - k_{12}}{k_{12}^{(2)} - k_{12}^{(1)}}; p_{21} \cdot \frac{k_{12} - k_{12}^{(1)}}{k_{12}^{(2)} - k_{12}^{(1)}} \right), \quad (27)$$

$$V^* = (0; 0), \quad (28)$$

$$W_{min} = b_1 \cdot p_{11} \cdot \frac{k_{12}^{(2)} - k_{12}}{k_{12}^{(2)} - k_{12}^{(1)}} + b_2 \cdot p_{21} \cdot \frac{k_{12} - k_{12}^{(1)}}{k_{12}^{(2)} - k_{12}^{(1)}}. \quad (29)$$

This solution satisfied the system of equations:

$$\begin{cases} a_{11}u_1^* + a_{21}u_2^* = c_1 \\ a_{12}u_1^* + a_{22}u_2^* = c_2 \end{cases} \quad (30)$$

In the new problem, for three types of products, the  $X_{12}^*$  plan will be optimal if the system conditions are satisfied in the dual problem:

$$\begin{cases} a_{11}u_1^* + a_{21}u_2^* = c_1 \\ a_{12}u_1^* + a_{22}u_2^* = c_2 \\ a_{13}u_1^* + a_{23}u_2^* \geq c_3 \end{cases} \quad (31)$$

The optimal plan for producing  $A_3$  products satisfies system (31), in which the third condition is not met:

$$\begin{cases} a_{11}u_1^* + a_{21}u_2^* = c_1 \\ a_{12}u_1^* + a_{22}u_2^* = c_2 \\ a_{13}u_1^* + a_{23}u_2^* < c_3 \end{cases} \quad (32)$$

If the conditions are met (8), (20)-(21) and

$$k_{13}^{(1)} < k_{13} < k_{13}^{(2)}, \quad (33)$$

then system (32) is equivalent to the system:

$$\begin{cases} a_{11}u_1^* + a_{21}u_2^* = c_1 \\ a_{12}u_1^* + a_{22}u_2^* > c_2 \\ a_{13}u_1^* + a_{23}u_2^* = c_3 \end{cases} \quad (34)$$

This system corresponds to the optimal plan in the dual problem:

$$U^* = \left( p_{11} \cdot \frac{k_{13}^{(2)} - k_{13}}{k_{13}^{(2)} - k_{13}^{(1)}}; p_{21} \cdot \frac{k_{13} - k_{13}^{(1)}}{k_{13}^{(2)} - k_{13}^{(1)}} \right), \quad (35)$$

$$V^* = (0; 0), \quad (28)$$

$$W_{min} = b_1 \cdot p_{11} \cdot \frac{k_{13}^{(2)} - k_{13}^{(1)}}{k_{13}^{(2)} - k_{13}^{(1)}} + b_2 \cdot p_{21} \cdot \frac{k_{13} - k_{13}^{(1)}}{k_{13}^{(2)} - k_{13}^{(1)}}. \quad (36)$$

The following plan corresponds to this optimal plan in the direct problem:

$$X_{13}^* = \left( n_{11} \cdot \frac{\beta_3 - \beta}{\beta_3 - \beta_1}; 0; n_{13} \cdot \frac{\beta - \beta_1}{\beta_3 - \beta_1}; \right), \quad (37)$$

$$Y^* = (0; 0), \quad (38)$$

$$Z_{max} = c_1 \cdot n_{11} \cdot \frac{\beta_3 - \beta}{\beta_3 - \beta_1} + c_3 \cdot n_{13} \cdot \frac{\beta - \beta_1}{\beta_3 - \beta_1}. \quad (39)$$

Thus, we found out that  $A_3$  production will be produced according to the optimal plan if the conditions (20) - (21) and (33) are satisfied, when the inequality:

$$a_{13}u_1^* + a_{23}u_2^* < c_3. \quad (40)$$

Inequality (40) is equivalent to the inequality

$$k_{13} > k_{13}^{(1)} \cdot \frac{k_{12}^{(2)} - k_{12}^{(1)}}{k_{12}^{(2)} - k_{12}^{(1)}} + k_{13}^{(2)} \cdot \frac{k_{12} - k_{12}^{(1)}}{k_{12}^{(2)} - k_{12}^{(1)}}, \quad (41)$$

which is equivalent to the condition

$$k_{12} < k_{12}^{(1)} \cdot \frac{k_{13}^{(2)} - k_{13}^{(1)}}{k_{13}^{(2)} - k_{13}^{(1)}} + k_{12}^{(2)} \cdot \frac{k_{13} - k_{13}^{(1)}}{k_{13}^{(2)} - k_{13}^{(1)}}. \quad (42)$$

Note that the article considered the transition to the production of products for which the indicator of the labor force was higher, the condition. At the same time, the proportion of resource reserves did not change.

## Discussion

In the course of the study, the income per unit of  $A_3$  production was compared with the assessment of the usefulness of resources (labor resources and equipment), which were determined by the optimal estimates of the usefulness of resources in the production of the first two types of products:  $A_1$  and  $A_2$ . The result of this comparison determines the strategy of the enterprise.

- 1) If the income from the output of a unit of product  $A_3$  is greater than the total estimate of the usefulness of resources in the production of products  $A_1$  and  $A_2$ , then the enterprise replaces the output of  $A_2$  with products  $A_3$ .
- 2) If the income from the output of a unit of product  $A_3$  is equal to the total estimate of the usefulness of resources in the production of products  $A_1$  and  $A_2$ , then the enterprise can produce three types of products at once. The production plan is not the only one.
- 3) If the income from the output of a unit of product  $A_3$  is less than the total estimate of the usefulness of resources in the production of products  $A_1$  and  $A_2$ , then the enterprise will produce products  $A_3$ , despite the fact that the rate of equipping with labor equipment is higher than in the production of products  $A_1$  and  $A_2$ .

## Conclusion

The practical significance of the work lies in the fact that a set of measures is proposed that contribute to the improvement of the human capital management system in a particular organization. Over the course of the study, it was attempted to analyze the modeling of human capital dependence and production with a high level of automation. And to meet that aim, systemic, structural-functional, and comparative methods were employed. Based on the results achieved, it can easily be concluded that in economics, there remain five major elements of production: Land, Labor, Capital, Entrepreneurship, and Information. Furthermore, the growth of production is related to the growth and connection of these five major factors. Of the five major factors of production, Labor, Entrepreneurship, and Information own a positive correlation to human capital. Plus, information holds a positive correlation as a source of knowledge, meant mainly for a person, as the foundation of human capital.

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## SHIP CREWING WITH A VIEW TO PROJECT RISKS AND TECHNICAL CONDITION OF THE VESSELEQUIPMENT

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### Abstract

Nowadays, shipping plays an essential role in the trade and tourism industry. The human factor is one of the most important levers of influence on the overall efficiency of shipping. The formation of an effective model of operating the ship is the main link in ensuring effective management of the shipping project. Therefore, it is necessary to have an effective team to implement any project, regardless of the industry, successfully. The article proposes a new approach to the calculation and optimization of the ship crew's quantitative composition, taking into account a detailed assessment of the project risks and the need to maintain the technical condition of the vessel equipment. In practice, the proposed approach will optimize the ship crew, which will reduce maintenance costs and project risks. Several risk management methods were used to achieve the research objective and testing of the hypotheses: methodology for estimating the net present value of the project; the method of estimating the internal rate of return of the project; the method of assessing the return on investment in the project; the method of estimating the payback period of the project; the method of estimating the discounted payback period of the project, as well as simulation tools (Monte Carlo simulation). Methods of systematization, grouping, and logical generalization were used to systematize and strengthen scientific novelty.

**Keywords:** Maritime Industry, Ship Staffing, Crew Size, Project Team, Optimization Model, Shipping Risks, Project Efficiency Assessment

JEL: O20

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## Introduction

Among the sectors of the economy, maritime sector can be attributed to those that are developing dynamically. The rapid development of the industry over the past decades is clearly evidenced by the annual increase in the number of passengers by 7.2% since 1990. In 2018, total world maritime trade amounted to 11 billion tons, which is 3% more than in 2017. Annual growth rates fluctuate within 3%, in particular in the period 1974-2014 — 3%, in 2015 — 1.8%, in 2016 — 2.6%. According to UN estimates and forecasts, the growth rate will reach 3.4% in the next few years (2021-2024) [20].

The specifics of shipping are that each voyage can be considered a separate project that requires financial investment, risk assessment and team planning for successful project implementation. In general, each project requires a rationale and a systematic approach to assessing the risks involved and the likelihood of their occurrence. The following methods of efficiency assessment are used in the practice of project management and for the evaluation of projects: measurement of investments based on discounting of income streams; estimates of the total cost of investments; investment attractiveness analysis; break-even analysis of investment projects; evaluation of the effectiveness of investment projects; evaluation of investment projects which involve foreign investors.

## Relevance of the Research Topic

Studying the problems of project evaluation by reviewing the existing scientific achievements, it was concluded that the results are limited due to their statistical nature and the lack of consideration of the probability of two scenarios: positive and negative. For example, the studies that focus on statistics include work that estimates the net present value of a shipping project [3], calculates the internal rate of return for projects in various fields [15], estimates project using a discounted payback period [4]. Some authors also support this assumption. They note, in particular, that the application of only the assessment of net present value and internal rate of return limits and hinders the objective assessment of investment in shipping, ignoring, for example, information about the physical condition of the vessel, risk and uncertainty (Diakomihalis 2003).

The risk factor in project management is widely considered in terms of determining the probability of a new project scenario [6]. It is effective to use a simulation model to determine each of these scenarios, that is when the analyst determines the type and probability of distribution of the project, and calculates the probability of the development of each model using the method of choosing the significance of uncertain variables [9].

The Company's human resources are both one of the most important resources and a source of potential risks [5; 10]. To date, a number of problems have been identified that significantly affect the efficiency of the shipping industry [14]: imperfect HR policy, increasing workload of crew members, increasing the cost of maintaining the crew, and so on.

The costs of maintaining the crew are a significant part of the production costs of the shipping company. That is why, in the context of increasing economic competition and deepening economic problems, business owners try to minimize costs and thus increase profits. Costs are mainly reduced by reducing the number of crew members, but this entails potential risks [19]. Such a strategy is likely to escalate into subsequent financial losses, as the costs of covering risks due to understaffing and increasing crew workload may exceed total staff costs [13]. The problem of the need to calculate the crewing efficiency is urged. The research objective is to build models for improving the qualitative and quantitative composition of the project team by the example of ship crews.

## Materials and Methods

The study involved several research methods that allowed achieving the goal and test the hypotheses: the methodology for estimating the net present value of the project to assess the effectiveness of capital investment in the project; the method of estimating the internal rate of return of the project to ensure equality of the current value of expected cash outflows and cash inflows; method of assessing the return on investment in the project; method of estimating the payback period of the project; the method of estimating the discounted payback period of the project to estimate the payback of the initial costs of the project, as well as simulation tools (Monte Carlo simulation). The method of identification and grouping was used for classification of project risks in the field of maritime transport. Methods of systematization, grouping and generalization were used in the process of systematization of information and summarizing the results of the research.

The most common method of assessing the effectiveness of capital investment in a project is the calculation of net present value (NPV). This method is used to determine the present value of all future cash flows generated by the project, including the initial capital investment, and is calculated by the following formula [15]:

$$NPV = \sum_{i=1}^T \frac{CF_i}{(1+p/100)^i} * -I_0 + \frac{L}{(1+p/100)^i} * \quad (1)$$

where  $CF_i$  is the cash flow for the  $i^{\text{th}}$  year of operation of the investee, defined as the difference between the income and the percentage of cash during the year  $i$ ;  $p$  is the discount rate;  $I_0$  – one-time costs at the time of the start of project activities;  $L$  - revenue from the liquidation of fixed assets of the project at the time of its completion.

Based on the obtained value of the criterion, we can draw a preliminary conclusion about the effectiveness of the investment project:

- If  $NPV = 0$ , the project cannot be called either profitable or unprofitable, all income goes to reimburse the costs of project activities.
- If  $NPV > 0$ , a conclusion is made on the acceptability of the project, and of several alternative projects, before adoption, one with  $NPV$  is higher is recommended.
- If  $NPV < 0$ , such a project is considered unacceptable, since it is inherently unprofitable.

Based on the features of the formation of cash flow as the difference between income and interest on cash during the year  $i$ , formalized CF can be expressed as follows:

$$CF_i = D_i - R_{ivar} - R_{ifixed} - R_{iloan}$$

where  $D_i$  is the income received from the operation of the investee for the year;  $R_{ivar}$  – variables operating costs for the year  $i$ ;  $R_{ifixed}$  – fixed costs for the year  $i$ ;  $R_{iloan}$  – loan costs for the year  $i$ .

The analysis of NPV and IRR criteria best illustrates the benefits of the project, but they do not take into account the possibility of risks associated with increased cash flows. Accordingly, the results of calculations for both criteria can be extremely contradictory. In this case, the NPV indicator is preferred because it shows the relevant result of the project. The PI (Profitability Index) is also worth mentioning. This index allows correlating the value of investment costs with future net cash flow of the project. In essence, the index of return on investment is an in-depth use of the NPV criterion and is calculated by the formula:

$$PI = \frac{\sum_{i=1}^T PV(CF_i)}{I_0} = \frac{\sum_{i=1}^T \frac{CF_i}{(1+p/100)^i}}{I_0} \quad (2)$$

where  $PI$  – index profitability on investment;  $CF_i$  – cash flow for the  $i^{\text{th}}$  year of operation of the investee, defined as the difference between income and interest on cash during the year  $i$ ;  $I_0$  – one-time costs at the time of the start of project activities.

The criterion of profitability index is closely linked to the criterion of net present value. It is built from almost the same elements. If  $NPV > 0$ , then  $PI > 1$ , if  $NPV < 0$ , then  $PI < 1$ .

Consequently:

- if  $PI > 1$ , the project is considered profitable;
- if  $PI < 1$ , the project is considered unprofitable;
- if  $PI = 1$ , the project is neither profitable nor unprofitable.

According to the results of the calculation of this indicator, the higher the return on each currency invested in the project, the higher the IRR value, and the higher the level of investment. By calculating this indicator, you can choose a more profitable project among close in terms of NVP, but with different amounts of investment required.

When calculating the effectiveness of a project, it is also important to calculate the payback period (PP), which will make it possible to understand over what period of time the invested funds will be returned to investors [15]. The payback period takes into account the cash flows during the project, as well as the speed of these flows. Thus, sales revenue can come by two schemes:

a) cash flows are constant over the years, then:

$$PP = \min T, \text{ at which } \sum_{k=1}^T CF_k \geq I_0 \quad (CF_k = \text{const}).$$

The payback period in this case is calculated by dividing the lump sum by the amount of the corresponding annual income. If a non-integer is obtained, it is rounded to the nearest integer.

b) cash flows are not constant, then:

$$PP = \min T, \text{ at which } \sum_{i=1}^T CF_i = I_0.$$

Regardless of the result obtained, whether the number obtained is an integer or a fraction, both values are calculated based on the assumption that income in each year comes with the same intensity [2]. The presented approach to calculating the payback period is convenient and easy to use, but has a number of disadvantages. One of the main disadvantages is short-term, which means that projects designed for the long term will not be adequately evaluated [15]. Another disadvantage is that this method is based on undiscounted estimates and it does not differentiate between projects with the same amount of total revenue, but with different distribution by year.

The formula for calculating the discounted payback period is:

$$DPP = \min T, \text{ at which } \sum_{i=1}^T CF_i / (1 + p/100)^i \geq I_0.$$

Obviously, when discounting, the payback period increases, i.e. always  $DPP > P$ . In other words, a project acceptable by the PP criterion may not be acceptable by the DPP criterion.

It should be noted that in evaluating investment projects, the PP, DPP criteria can be used in two ways:

- the project is accepted if the payback takes place;
- the project is accepted only if the payback period does not exceed a certain limit.

The concept of risk in project management involves a combination of two components: probability (P) and level of damage (U) [17]. This concept can be defined using the following formula:

$$R = P \cdot U,$$

where  $R$  is the project risk;  $P$  is the probability of the event and the severity of its consequences;  $U$  – damage caused by this incident.

The risk assessment process is mainly about monitoring the company's activities and operations, identifying what could cause the project to fail, and deciding what to do to prevent it. These areas include the following: hazard identification, risk assessment, application of control measures to reduce risks, monitoring the effectiveness of controls. Risks can be ranked by different levels. Project management typically uses a project risk matrix, which is a visualization of the perception of the risk landscape for a particular project [24]. The use of the matrix allows assessing the risks that the project team and the head of the enterprise are likely to face. The matrix is a distribution of risks depending on the frequency of risk and their consequences (Table 1).

Table 1. Project risk matrix

Risk probability	Risk severity				
	Catastrophic A	Hazardous B	Major C	Minor D	Negligible E
Frequent 5	5A	5B	5C	5D	5E
Occasional 4	4A	4B	4C	4D	4E
Remote 3	3A	3B	3C	3D	3E
Improbable 2	2A	2B	2C	2D	2E
Extremely improbable 1	1A	1B	1C	1D	1E

Risk assessment using a risk matrix should be supplemented by statistics assessment to obtain a comprehensive evaluation of the project (quantitative and qualitative indicators). The project quality assessment is also often used in the field of shipping [1]. In the field of shipping, risks are divided into (Kramsky and 2017; 7):

- natural, arising from climatic and geophysical changes;
- operational (production), which can be caused by errors on the part of managers;
- technical, which directly arise due to outdated technologies, imperfect systems on ships, significant wear of ships;
- information, inconsistency of the vessel's documentation;
- tracking of the vessel and cargo, additional control costs.

Analysing each risk separately does not seem effective, as they are interrelated and, in some cases, may reinforce each other (Kramsky and 2017a). Thus, risks are analysed as a complex system that involves a combination of

potential hazards to different events (stages in the project), while the probability is determined for each risk separately. This technique resembles a tree (the so-called event tree), where each branch is a separate hazard with its level of probability of occurrence during project implementation. Each serious violation of the project is caused by a number of reasons, but one reason can lead to one violation. In the analysis of complex systems, the construction of an event tree allows you to logically link the various causes of violations, to establish their probabilities and thus better understand the system. This approach visualizes causation, which has the potential of a positive impact on risk assessment at the ship crewing stage and at the project implementation stage.

The method of simulation modeling, which is widely used in various fields, including project modeling, deserves special attention. With this method, you can predict the condition and operation of the object in real conditions, which allows preventing possible negative consequences during the project implementation (Kramsky 2014). In a narrower sense, simulation is a process of logical-mathematical description of an object that can be used for experimentation, analysis of the object and its functional evaluation. Simulation is performed at any given time interval. Simulation modeling, as a tool for experimental research of complex systems, covers the methodology of creating system models, algorithmization methods and software implementations of simulators, planning, organization and realization of experiments with simulation modelson computers, data processing and analysis of results.

The Monte Carlo simulation is another method of simulation for the approximate reproduction of real phenomena. This method creates an additional opportunity in risk assessment because it allows creating random scenarios [15]. This method is also valuable because it allows simulating project schedules, using aggregate estimates for the worst case and the best option, and you can determine the most likely duration for each task to determine the results for the whole project.

It is clear that the described methods are not the only ones that allow assessing the effectiveness of the project and the risks that may arise during its implementation. The application of risk analysis uses huge information volumes, in the form of objective data or expert assessments, to quantify the uncertainty that exists about the main components of the project and to reasonably calculate the likely impact of uncertainty on overall project performance.

## Results

As a result of a comprehensive risk analysis of the project, most analysts receive not only a single mathematical value of NPV, but also the probability distribution of all possible values of this indicator. It is important for potential investors to obtain detailed characteristics of the possible risks of the project, which can be obtained by applying the Monte Carlo method. Each of the risks, even the smallest, can have negative consequences for the project as a whole and incur financial losses. The availability of detailed information and interpretation of each of the risks will influence the investment decision.

According to the Monte Carlo simulation procedure, the mathematical model for determining the financial indicator (NPV in our case) is subjected to machine simulation (using computer hardware). As a result of simulations, consecutive scenarios are built using the original data, which are not defined by the content of the project and are therefore considered random variables in the analysis process. The simulation process is realized in such a way that the random selection of values from certain probability distributions does not violate the existence of known or presumed correlations between variables. The obtained results are subject to future analysis for a comprehensive assessment of the weight of each of the possible risks, as well as the possible consequences of the risk, their impact on the project. The risk assessment process can be divided into the following stages (Figure 1)

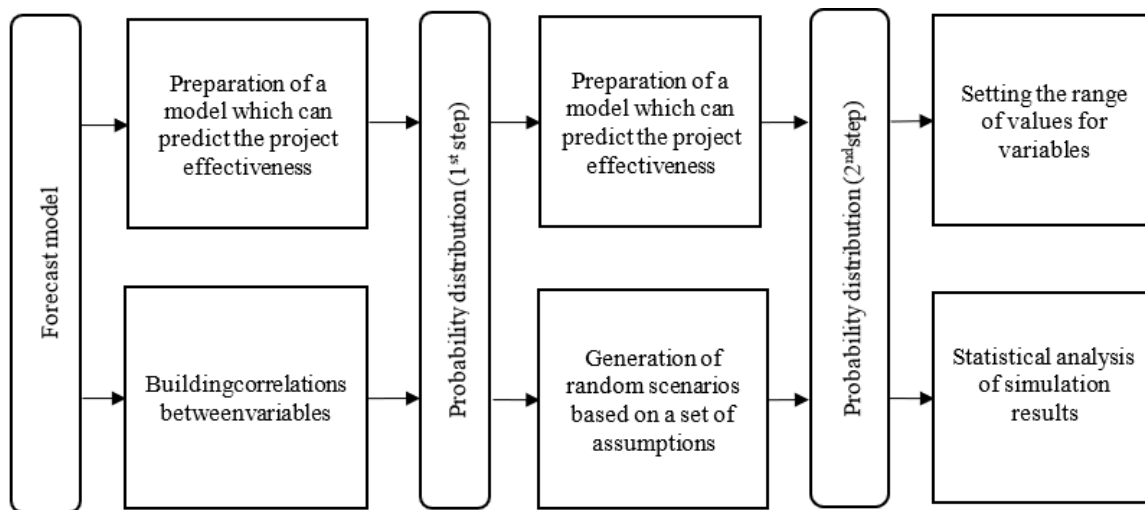


Figure 1. The process of risk analysis by the Monte Carlo method

Creating a forecasting model is the first step in the risk analysis process. This model determines the mathematical relationships between numerical variables related to the forecast of the selected financial indicator. In the case of investment risk, the basic model is the assessment through NPV.

$$NPV = CF_0 + \frac{CF_1}{(1+r)^1} + \frac{CF_2}{(1+r)^2} + \dots + \frac{CF_n}{(1+r)^n} = \sum_{k=0}^n \frac{CF_k}{(1+r)^k} \quad (3)$$

There are some difficulties with the application of the NPV formulation presented. When generating random numbers, the annual cash flow can act as a random number that obeys a certain law of distribution. As mentioned earlier, this indicator is cumulative and includes many components. Accordingly, a change in one of the components leads to a change in the aggregate. Thus, NPV correlates with volume. In order to obtain the most reliable results, it is necessary to carefully study this relationship. If we consider the process of forming a general forecast model, a significant number of random scenarios are generated as a result of modeling, each corresponding to a certain value of cash flows.

All generated scenarios are systematized and subject to statistical processing, as a result of which the share corresponding to the negative value of NPV is determined. Comparison of the number of such scenarios to the total number of scenarios generated determines the baseline assessment of the investment risk of the project. By distributing probabilities, it is possible to predict future events, and thus predict the most plausible scenario under which the project will be most effective. The general theory of investment analysis usually uses one type of probability distribution for all selected variables that are included in the proposed model. This type is called a deterministic probability distribution, and it reduces all probabilities to a single value. When evaluating the available data, the analyst is limited to either choosing a single set of possible results or calculating an integrated indicator. In this case, the analyst must recognize that the selected value must be realized, and therefore its probability is 1. Since this probability distribution has one result, the result of the analytical model can be determined on the basis of only one calculation (or one run of the model).

Determining random variables and providing them with an appropriate probability distribution is a prerequisite for risk analysis. After all these steps, you can proceed with the simulation phase. In this aspect, one condition is also worth emphasizing — a direct transition is possible only if there is a pre-established correlation of random variables included in the proposed model. In this case, correlation should not be expected, due to the theoretically justified correlation between indicators, as for example between the unit price of the product and the revenue from the sale of this product on the market. This predictable correlation may slightly distort the results of the analysis. In fact, the correlation limits the random selection of individual values for correlated variables. Two variables to be correlated are simulated in such a way that if one of them is chosen randomly, the other is chosen not randomly, but in the range of values controlled by the simulated value of the first variable.

At the start-up stage of the model, a risk analysis is performed using computer operations. It is important to remember that when studying the stationary characteristics of the network, it is advisable to take into account the influence of the initial state. Taking into account all reasonable assumptions, you can continue with the calculation of the model itself (each recalculation is one “run”) until you get enough values to make a decision about the project (for example, more than 1,000). A variety of software is used for simulation. The most acceptable and applicable is Risk Master, which was developed at Harvard University. However, it should be noted that the

number of such programs is growing every year, which indicates significant scientific progress in the field of project risk assessment.

At the final stage of risk analysis, after running the simulation model, the obtained data are processed and the results are interpreted. Each run represents the probability of the event equal to:

$$p = 100 / n,$$

where  $p$  is the probability of a single run, %;  $n$  – sample size.

For example, if the number of random runs is 5000, then the probability of one run is:

$$p = 100 / 5000 = 0.02\%.$$

In investment projection, it is advisable to use the probability of obtaining a negative NPV value as a measure of risk. This probability is estimated on the basis of statistical simulation results as the product of the number of results with a negative value and the probability of a single run. For example, if negative NPVs are detected in 4,156 cases out of 7,000 runs, the risk index will be 59.4%. Based on the obtained result, the project or enterprise managers consider possible directions and decisions regarding risk reduction in order to achieve the company's goals, namely profit.

The tree of logical violations can be represented schematically (Figure 1). This tree demonstrates the causal relationship between events that together can cause a higher-level event. This analysis is performed to determine the probability of the occurrence of the highest-level event, which may be an accident or an undesirable outcome, accompanied by various losses.

The following formula was used. In this formula,  $U$  is a danger,  $P$  is an event. Accordingly, it is possible to understand which event has the greatest impact on the occurrence of certain risks.

$$R = \sum_{i=1}^n (P_i \cdot U_i) = U_1 \cdot (P_1 + P_2) \cdot P_3 + U_2 \cdot (P_1 \cdot P_2 + P_4) + U_3 \cdot P_2 \cdot P_5 \cdot P_4 + U_4 \cdot (P_2 \cdot P_5 + P_6) \quad (4)$$

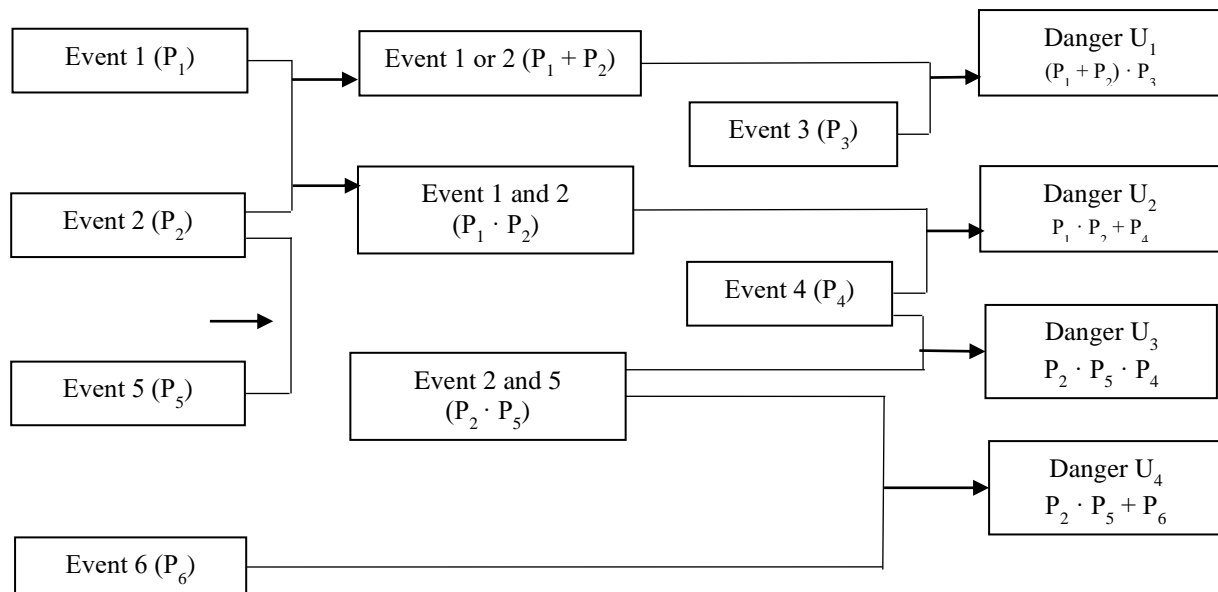


Figure 2. Example of building a project failure tree

As a criterion for the optimality of the crew in this model, it is proposed to use the value of  $e$ , which is defined as the difference:

$$E = \Delta R - \Delta Z \rightarrow \max,$$

where  $\Delta R$  is the reduction in the risk of an emergency due to an increase in the number of crew;  $\Delta Z$  - increase in the cost of the ship-owner for the maintenance of the crew.

$$\Delta R = \sum_{i=1}^l (P_{ir} \cdot U_{ir}) - \sum_{i=1}^l (P_{or} \cdot U_{or})$$

$P_{1i}$  and  $P_{0i}$  – the probability of an emergency in the changed and basic version of the team, respectively;  $U_{1i}$  and  $U_{0i}$  – damage to the shipowner in the event of an emergency in the amended and basic version of the crew, respectively [13; Zakharchenko and Zakharchenko 2019).

The simulation results for the proposed object, namely the optimality of the crew, are presented in Figure 2. The application of this method allows calculating the rational ship crew taking into account the technical condition of the vessel, technical systems and equipment. The proposed model will allow optimizing both the qualitative and quantitative composition of the team depending on the planning period. Thus, we consider the hypothesis confirmed, namely that the simulation model and the methods described above can be used in the formation of project teams by the example of ship crews.

## Discussion

Modern processes of informatization and technological development have led to the popularization of simulation through the possibility of using a variety of software products. Decades ago, general theoretical approaches and manual calculations were used to assess project risks, while the current period is characterized by a deepening and systematization of approaches that allow a more thorough approach to determining the effectiveness of the project.

The introduction of a simulation model for projects of shipping companies is justified by the need to increase the overall efficiency of the industry in a global economic downturn, and the formation of a rational quantitative and qualitative composition of project teams as a basic resource of companies. The use of this model to optimize the quantitative composition of the crew taking into account all possible risks will minimize both the shipowners' costs for maintenance of the crew and the cost of covering the risk, taking into account the inverse relationship between these financial losses.

The application of the proposed model is not limited to ship crewing. It can also be used as a starting point in scheduling crews (Ernst et al. 2001), which will have a positive impact on the level of productivity of the company's human resources. The proposed model also has advantages due to the consideration of all risks, and therefore can be the basis for calculating the optimality of the team, taking into account the professional skills and experience of staff [13].

The simulation model can complement the optimization approach to the selection of the project team (Baykasoglu, Dereli and Das 2007) as well as risk-oriented tools [13], which in the long run will ensure a full process of HR management according to quantitative and qualitative parameters. It is also important that the proposed model is consistent with the approach of safe manning of merchant ships (Alapetit&Kozin 2017). Despite certain limitations, the proposed model can also be applied to risk determination both at the team level and at the company level. In order to determine the potentially most rational set of labour resources, it is necessary to include a larger number of potential risks and parameters of the model in general [9].

Comparing the model with the existing concepts of quality composition optimization (Zhao and Zhang 2018), we can assume its better adaptation to real conditions, as it does not require a significant data volume on crew quality, namely: professional skills and abilities, experience. It is assumed that this information is selected during the work of recruitment agencies with staff at the stage of initial recruitment. Therefore, a slight deviation from the norm will not significantly affect the level of the company's costs.

## Conclusions

In the modern world, the company's labour resources are among the most important, and productivity has a significant impact on the overall level of the company's performance. This statement should be taken into account increasing to achieve the highest results and achieve goals. Taking into account the weight of the human factor is extremely necessary at the stage of creating a project team, as it will avoid unwanted actions and mistakes.

The authors of the article proposed the approach on project risk assessment to optimize the quantitative composition of the ship crew through a more accurate and systematic assessment of the level of project risks, as well as the costs associated with the maintenance of equipment on board. The application of this approach in practice will meet the needs of technical equipment management, minimize the shipowner's risks and costs, as well as achieve a higher level of efficiency of the company's operating activities.

The need for practical application and further interpretation of simulation results is emphasized, which will significantly increase the relevance of the research results. Unlike the usual experiments, the simulation model can be easily repeated and reproduced taking into account changes in certain indicators. An additional advantage of the simulation model is the possibility of statistical methods for processing the results.

The article also emphasizes the need to combine several risk assessment methods to optimize the quantitative and qualitative composition of project teams. In particular, taking into account the criteria of quantitative optimization of the project team depending on the characteristics of the object, namely: type, age, technical condition. A complex parameter was used as a target function of the project team optimization, which takes into account the cost of maintaining the crew and reducing the risk of critical situations during operational activities.

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## FISCAL IMPACT OF PROPERTY VALUATION IN THE PRIVATIZATION PROCESS: THE CASE OF UKRAINE

Lillia Tymoshchuk<sup>55</sup>

### Abstract

In countries with economies in transition, the fiscal impact of property valuation in the privatization process may be low due to the lack of governance practices, corruption risks, and the pursuit of political goals. Property valuation specifically determines the level of budget revenues and long-term fiscal effects: underestimation of property valuation due to political interests can entail the lack of growth in profitability and efficiency of privatized facilities; overestimation of the objects' value can lead to a low level of competition. The purpose of the article was to study the fiscal effects of property valuation in the privatization process drawing on the experience of Ukraine as a country with economy in transition. Based on the methodology combining qualitative and quantitative data as well as statistical analysis, the fiscal effects of property valuation during privatization in Ukraine were addressed. Management balance sheet and market mechanisms of property valuation at sale were revealed. The study proved the importance of a restrained privatization policy under the conditions of a crisis in a transition economy to ensure short-term and long-term fiscal impact. The automation of property valuation processes and creation of electronic sales systems ensure the effectiveness of market approaches to valuation and price increases for sales items. In the conditions of transition to market conditions, the restrained policy and automation of price formation mechanisms basically are a way to reduce the risk of underestimation of the value of state-owned objects.

**Keywords:** Effects of Property Valuation, Fiscal Efficiency, Municipal Asset Appraisal, Municipal Property Appraisal, Privatization, State Property

JEL: H3, L33, P26

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## Introduction

Property valuation determines the fiscal impact of privatization in the short and long term. The quality of institutions and appraisers, legislative regulation have impact on the fiscal effects of evaluation. The transition to a market economy means the intensification of privatization processes, and as a consequence – the appraisal of state property and the potential loss risks of state and local budgets from undervalued assets. In Ukraine, the intensification of state property assessment began in 2018-2019 after the improvement of the legal base. In the context of the transformation of and the formation of mechanisms for state assets evaluation in Ukraine, there are risks of underestimating the cost of selling assets and risks of maximizing the sale price of assets for political purposes. These risks threaten the loss of the state budget, which in the context of the solvency crisis requires the study of fiscal effects of property valuation during privatization.

The purpose of the article is to study the fiscal impact of property valuation in the privatization process based on the experience of Ukraine as a country with economy in transition.

## Literature Review

### *Fiscal Impact of Privatization*

Privatization is referred to as political progress in implementing the country's reform agenda, leading to increased investment in the economy. The success of privatization is determined by the level of country's economic development. In low-income countries, privatization is unlikely to yield rapid positive effects. For instance, the cases of Armenia, Moldova and Guinea provide vivid examples to that end. Privatization does not always ensure the increase in productivity. The internal transformation of companies after privatization depends largely on government policy and the conditions of the domestic market. Limited competition, regulatory policy, monitoring, and lack of reform restrain fiscal long-term effects. Institutional and administrative conditions are especially important in the privatization of natural monopolies and in sectors such as banking. However, overall, in accordance with technical assessments, privatization is one of the most successful liberalization reforms in terms of improving the efficiency of the economy and, consequently, competitiveness and growth prospects in the country. In most cases, privatization provides a profit for new private owners, sparing the state administrative and unproductive financial burden. Fiscal effects provide a granted long-term budgetary impetus and support larger-scale economic reform processes that promote the development of the internal market [2].

The proceeds from privatization are viewed as financing the budget, which never underestimate the state of the private sector, in contrast to taxation. Net revenues from privatization objects can reach 1% of the country's GDP [10]. In some cases, privatization may reduce the investment and aggregate demand due to tax rise. The effects of privatization are difficult to foresee, and funding through state budget privatization does not guarantee fiscal cushioning to support investment or aggregate demand [14]. However, in most cases, privatization is considered effective and successful. The exception may be exemplified by the countries with economy in transition, where the appeal of privatization processes is declining. Privatization causes a distributive effect through changes in asset ownership, income, and employment, access to utilities, infrastructure, and the cost of these services [2]. Moreover, privatization affects the government deficit, public debt, unemployment and economic growth. Privatization provides automatic reduction of the budget deficit in the short-term and medium-term perspective [16]. In Greece, Spain, Portugal and Italy, privatization proceeds have been negatively correlated with budget deficits, though this being the case for OECD countries. The studies show a negative relationship between privatization proceeds and OECD public debt, which is not typical of Belgium, Italy and Greece [13].

The country's fiscal policy and position also envisions the effectiveness of privatization in transition economies. The privatization program may induce the deterioration in the distribution of assets and income in the short-term perspective. Such an effect is particularly evident in transition economies. An exception to this is the electricity and telecommunications sector, where the process has specifically expanded access to the range of services in these sectors [2]. That having been said, in developed countries the privatization of various types of assets ensures a higher level of enterprise profitability as well as labor productivity [20]. The policy of mass privatization (for example, due to the financial crisis) tends to aggravate the problem of maximizing income from the sale of assets. This stipulates the use of instruments to curb privatization processes (claims, loans, equity issue), which reduces the inefficiency of the funds utilization proceeding from the sale of objects, improves the control decentralization [4]. It is expedient to carry out privatization during the period of economic growth, since "Privatization has become a popular policy since 1980, particularly for governments facing difficulty in raising revenue" [16]. Important prerequisites for the sale of assets are also the processes of liberalization and deregulation of the market, while the sale of assets in the absence of liberalization does not increase the efficiency of privatization [8].

An IMF survey of 18 countries undergoing privatization shows a fiscal effect on gross revenues of 2% of annual GDP [6]. The government receives about 50% of its revenues through significant financial costs, sales procedures costs, and workforce redundancy. Revenues of 1% of GDP are significant, but the long-term effects of privatization are due to the reduction of subsidies for state-owned entities, and not due to budget revenues from sales. In addition, after-sales revenue increases, leading to higher taxes and enhanced productivity. Direct sales revenue is basically less than tax revenue gained after the sale of state-owned entities [2].

Privatization can affect real tax-deductible income if its fiscal effects comprise a differentiated reduction in the tax burden on households or a differentiated increase in the benefits of public services, such as education and health care, which are financed by new tax revenues. The fiscal consequences of privatization in the context of income distribution arise from the changes of any kind in revenues (including through the impact on the expansion of services) and costs, are indirect and are likely to have compensatory character. The reduction of tax revenues outflow and the increase of any kind in government spending is the most viable effect for the poor population. Indirect effects are underwritten by financial problems in countries where sales revenues are disbursed instantaneously. This leads to the pursuing with the weak tax and budgetary policy, and ultimately due to the cost of growth, as well as due to increased capital. As noted above, in developing countries as well as in economies in transition, the net fiscal effect is 1% of GDP. A considerable fiscal advantage is the elimination of direct budget transfers (which subsidized commercially nonviable enterprises or compensated for the politically motivated understatement of prices for services or the enterprise's produce). Such flows of subsidies are crucial in the areas of public services and public infrastructure, such as energy, water and sanitation, railways and telecommunications, which often brings about the rationing of services at reduced prices. As the studies show, such subsidies most commonly apply to the poor [2].

In a number of developing countries tax systems can be viewed as regressive. They are heavily dependent on indirect trade taxes and value added taxes (consumption). Privatization facilitates the reduction of the funds outflow for the maintenance of unprofitable firms and provides indirect benefits in the form of increasing the retained earnings. Private firms with better management and higher productivity tend to pay more taxes, thereby increasing government revenues. Because the cost structure in most developing countries is more progressive than income distribution, it provides indirect benefits to the relatively poor [2].

In many cases, the government uses privatization proceeds to reduce the volume of public debt. At first sight, this makes sense. But the end use of privatization proceeds is a function of the government's overall financial performance, because even when revenues reduce debt, fiscal indiscipline means that these revenues indirectly finance the government's current expenditures or increase its ability to increase borrowing. This can entail the loss of potential financial benefits due to a lack of budget surplus [2].

### *Fiscal Effects of State Property Valuation*

Countries with economies in transition due to the immaturity of the competitive market environment are more likely to underestimate the sale price of state property, and therefore the fiscal effects of privatization are less vivid [2], [7], [10]. This is due in particular to the low level of access to global financial markets in developing countries, which determines the state of competition [9]. Various reasons for privatization also affect the property valuation, although it is mainly a transition to market conditions. Market transformations encourage the development of management policies of privatization process, which should take into consideration the understanding of the internal market and take account of the risk of possible gaps in the regulation of privatization processes and evaluation. The purpose of privatization involves the reconstruction of assets, their more impactful use and the formation of more effective conditions for the private sector [3].

Government policy determines the effectiveness of property valuation due to understatement of asset prices, as a consequence of not taking into account the valuation of future cash flows of investors. This means the need to understand the capital structure of potential investors and asset financing strategies [1]. On the other hand, the appraisal of a privatization object is a difficult task due to the uncertainty related to the scale of the object, the length of the privatization period, etc. Traditional methods of estimating the future cash flows of the objects being assessed (net present value) cannot estimate the future performance of the objects and the prospective risks of privatization [12]. In many cases, the sale price of an asset is 50% of the present value of the cash flow that is not received through privatization. This implies the exceeding of the sale price loss or the equaling of assets' sale price to the loss [16]. The use of accounting methods in the valuation of assets as a strategic method in the course of privatization does not always guarantee an objective assessment. However, these methods may be part of the asset valuation methodology to achieve varied policy objectives [5].

## Methodology

This study draws on the qualitative and quantitative methodology for analyzing the fiscal effects of property valuation in the course of privatization. The study is conducted through the lens of the concept of asset management based on management balance sheet data and market mechanisms of property valuation at sale. Statistical analysis of income indicators, auctions and estimated value of assets was used to probe into the fiscal effects of privatization. The source of data is the database of the State Property Fund of Ukraine, which contains information covering 2018-2020 in terms of the main types of objects of sale of state property: land; objects of administrative, industrial (warehouse), commercial and residential real estate. Statistical analysis was performed using statistical indicators: the average value, the minimum and maximum price of the estimated value of objects. The indicator of the average estimated value in terms of appraisal objects in Ukraine (UAH / sq. m) is generalized drawing on the territorial basis of the indicator. For a qualitative assessment of fiscal effects, the content analysis of the State Property Fund reports was used in order to address the mechanisms of privatization and approaches to the valuation of objects of sale in the transition economy. The main reports for content analysis are chosen the monthly reporting from the Unified database of evaluation reports, which contains information about the type of evaluation object, the date of evaluation, the estimated value of the evaluation object (UAH), the location of the evaluation object, the region of the evaluation object, the appraised value of the share (UAH), the area of the object location, the type of real estate object, the classification by classes, the year of commissioning, the total area (sq. m), the real (property) rights to the land plot, the engineering equipment, the physical condition, the analysis of the most efficient use, the size of the estimated share (sq. m) [17], [18]. The analysis of reports on the appraised value of small privatization objects yielded an identification of the potential fiscal effect of privatization in the short-term perspective by virtue of the revenues to local budgets.

## Results

In Ukraine, privatization processes have been active since 2008, in 2018-2020 the State Property Fund published information on the state of privatization and valuation of assets, information on objects of small (up to UAH 250 million) and large-scale privatization (more than UAH 250 million). The COVID-19 pandemic made the solvency crisis of 2020 more acute, and correspondingly the risks of the political and economic environment. As a result, the State Property Fund's policy is to curb the sale of state-owned facilities through auctions until financial markets stabilize. At the same time, from the end of 2018, small-scale privatization objects are being evaluated en masse in Ukraine in accordance with international and national evaluation standards. The evaluation mechanism was changed due to enhancing the legislative regulation, which ensured the development of appraisal institutions and the private market of appraisers. The policy of privatization of large objects, mainly in industries, has a restraining character and is aimed at finding a profile investor. A transparent competitive sales mechanism will ensure the pricing of objects based on a market approach. Despite the policy of restraint, the processes of preparation for privatization continue: the audits of objects, the elaboration of marketing tools to popularize objects of sale [17], [18].

In Ukraine, the property valuation processes intensified in 2018-2020, as evidenced by the systematic valuation of various types of assets (Table 1). The average appraised value in terms of appraisal objects in Ukraine is determined by private appraisal entities and depends on territorial features, condition of the object and type of asset. The highest selling prices for residential real estate are in the central and middle zones, administrative real estate and commercial real estate. That said, the prices average for industrial facilities comprises 3,505 UAH per square meter. This is due to the structure of the economy and the state of industrial facilities, the predominance of wholesale and retail trade in the structure of the Ukrainian economy, and as a consequence the better state of privatization objects. As a consequence, the sale of small objects in various sectors of the Ukrainian economy will predominantly take place at low prices.

*Table 1. Average appraised value in terms of valuation objects in Ukraine, UAH / sq. m (Generalized on a territorial basis of the indicator's value)*

Oblast center	Mean	Min	Max
Residential real estate, periphery, UAH / sq. m.	11247	5168	23855
Residential real estate, middle zone, UAH / sq. m	14639	6710	32614
Residential real estate, central zone, UAH / sq. m.	19952	9002	43943
Residential real estate, district centers, UAH / sq. m.	4499	2067	9542
Land plot, periphery, UAH / sq.m	165	66	608

Land plot, middle zone, UAH / sq. m	701	211	4757
Land plot, central zone, UAH / sq. m	2357	527	10970
Administrative real estate (median by settlement), UAH / sq. m	15253	4577	38574
Industrial (warehouse) real estate (median by settlement), UAH / sq. m	3505	900	8087
Commercial real estate (median by settlement), UAH / sq. m	16950	7436	74641

Source: [17], [18].

Among the main problems of valuation of assets and property in Ukraine is the lack of accounting for objects. The balances of 10.7 thousand of state-owned entities do not keep records of property. This hinders privatization and evaluation processes, resulting in the evaluation phase average of 147 days. Moreover, the lack of book value of the appraised object complicates the appraisal process, as there are thousands of state-owned such items. The lack of a developed competitive market aggravates the problem of the duration and objectivity of valuation due to the impossibility of comprehensive use of the market approach to valuation. Among the essential valuation problems is the lack of a balance holder that necessitates the additional procedures of the ownership acceptance transfer with the aim of selling the property in question.

The average appraised value of a land plot in Ukraine is 127.6 thousand UAH, of a real estate administrative object - 757.9 thousand UAH, of a real estate industrial object - 485.1 thousand UAH, of a real estate commercial object - 815.1 thousand UAH, of a residential real estate - 481.6 thousand UAH. The standard small-scale privatization procedures on average last 9-10 months. E-auctions are virtually the only way to sell small-scale privatizations. The objects of small-scale privatization predominantly are enterprises and property worth less than UAH 250 million. These items are sold exclusively through the electronic trading system. Privatization is basically carried out publicly, and closed-door agreements are excluded, which minimizes the political risks of interfering in price formation. Sales through the electronic system Prozorro. Sales do not restrict access to bidding and do not create artificial conditions for price formation. Thus, small-scale privatization through a market mechanism opens up new opportunities for the private sector – a free and transparent mechanism for acquiring property. Information in terms of objects is publicly available on the website or on ProZorro.Sales. As of December 10, 2020, there are 41 companies whose shares have been put up for sale; 229 unified property complexes of state enterprises and their structural subdivisions, including those leased, other property subject to privatization; 435 objects as separate property for sale; 87 objects of unfinished construction, laid-up objects subject to privatization; 35 objects of social and cultural purposes (Table 2).

Table 2. Average appraised value broken down by valuation objects in Ukraine, UAH

	Land plot	Object of administrative real estate	Object of industrial (warehouse) real estate	Object of commercial real estate	Object of residential real estate
In total, the average cost	127638,88	757912,54	485078,73	815142,96	481642,69
Maximum cost, UAH	15515323,00	7093800,00	120000000,00	33257510,00	19432000,00
Minimum cost, UAH	87,00	4501,00	3297,00	15676,00	3738,00
peripheral	154388,30	627948,62	534453,84	470469,60	458577,60
outside the settlement	79431,35	77402,50	358869,08	307514,40	207961,82
suburban	102159,96	229226,11	278408,10	137718,20	339396,82
middle	138082,84	1389290,13	308006,47	1968321,00	615513,44
central	970114,66	2449915,31	99368,00	1099368,40	1054007,49

Source: [17], [18].

As of the end of 2020, 2.65 thousand small-scale privatization objects were sold (the total number of objects of sale is 6.75 thousand). The declared value of the objects amounted to UAH 24.7 billion, the income from the sold objects amounted to UAH 33.6 billion (Table 3). This means that e-auctions in Ukraine facilitate the formation of competitive market prices for privatization objects, which ensures the valuation effectiveness based on the market

mechanism. Electronic auctions take place through the Prozorro.Sales platform, which is created for the sale of state assets on the principles of free competition, accessibility, publicity and efficiency.

*Table 3. The dynamics of auctions and revenues from the sale of small privatization objects in Ukraine in 2016-2020*

	2016	2017	2018	2019	2020
Number of auctions, thousand	58*	3,45	10,07	19,23	36,3
Revenue, UAH million	41,68	4 830	12 340	21 830	33 610
Declared value, UAH million	38,11	4 440	10 640	18 060	24 790
Margin between the declared value and revenue	-3,57	-390	-1700	-3770	-8820

*Source: [15].*

\* - in items

The main methods of selling objects are the auction by the method of step-by-step reduction of the starting price and subsequent submission of price proposals (47 objects), the auction with conditions / without conditions (86), the auction with reduction of the starting price by 50% (38), redemption (1, in particular by redemption by the buyer, who is the only one to apply for participation in the auction with conditions (without conditions) or by redemption by the buyer, who is the only one to apply for participation in the auction with a reduction of the starting price by 50%) (Table 4).

*Table 4. Structure of electronic auctions in terms of types of small privatization objects*

Types of objects	auction by the method of step-by-step reduction of the starting price and subsequent submission of price proposals	auction with conditions / without conditions	auction with a reduction of the starting price by 50%
Alcohol industry	0	16	2
Public stocks	0	2	1
Unified property complexes of state-owned enterprises	0	1	5
Objects of unfinished construction	16	9	2
Objects of socio-cultural significance	2	2	3
Free-standing property	29	70	27
Real estate	43	77	37
Movable property	4	6	0
Total types of objects put up for an auction	94	183	77

*Source: [17], [18].*

Thus, most small-scale privatization objects can be sold at a reduced / inflated price or a starting price, as auctions using a step-by-step reduction of the starting price or a 50% reduction in the starting price are the preferred method of privatization. This means progress in electronic market mechanisms of privatization. At the same time, the procedures of inventory, appraisal and informing about the activation of small privatization objects are actively taking place at the national and local levels.

The starting price of the object for each of the methods of sale (excluding VAT) differs significantly. For example, the price of the object of privatization of the premises of the administrative and household plant in the case of sale at auction without conditions was UAH 62,104.68; in case of sale at auction with reduction of the starting price - UAH 31052.34; in case of sale at auction by the method of step-by-step reduction of the starting price and subsequent submission of price proposals - UAH 31052.34. The presence of the buyer's competitors yields the sale of the object at a price of UAH 60007.

Overall, the initial price of property in Ukraine is set by the privatization body, another state body or local government body (tender, auction commission formed by these bodies) taking into account the results of property valuation conducted in accordance with the Property Valuation Methodology, which initiates the sale of property in accordance with the state-approved methods which ensures the competition of buyers and change of the price in the course of the sale.

In general, the sale of small-scale privatization objects on the basis of price formation at electronic auctions, which corresponds to the market approach of setting the price of state property, yields an increase in the estimated value of property (by 65.14%). In fact, as the statistics show, 70% of small privatization objects in Ukraine are sold at a price exceeding the initial starting price.

It should be noted that as of December 2020, a total of 8 auctions took place and 5 small privatization objects were sold. Sales prices significantly exceed the starting price or equal the starting price (Table 5). This means the effectiveness of the electronic mechanisms and a market approach that guarantees transparency and publicity in the appraisal of state property.

*Table 5. The difference between the starting sale price and the final price of small privatization objects in Ukraine, UAH*

Object of sale	Starting price	Sale price	Difference, +/-
1	31052	60007	28955
2	29350	49500	20150
3	31 372 965	55 000 001,00	23627036
4	17 020	2 510 000,00	2492980
5	2199	1 800 003,00	1797804
6	159 687	350 001,00	190314
7	736 133	800 100,00	63967
8	78 200	78 200	0
Total	32426606	60647812	28221206

*Source: [17], [18].*

Compared to the EU countries, in Ukraine the main sectors of privatization are the energy sector (11 large privatization objects), mining industry (3 large objects), machine and instrument engineering (3 large objects), agricultural sector (3 large objects), chemical industry (2 large facilities), health care, culture and sports (2 large objects), processing industry (1 large object). The major mechanism of privatization is the sale of equity interest. The privatization procedure is accompanied by the integration of international corporate governance practices. This implies a change in management approaches in favor of market and greater fiscal efficiency in the long-term perspective due to increased revenues from privatized large objects and tax revenues to the state budget. In the EU countries, the sectors primarily privatized were agriculture (the average share of transactions 57.90%), public administrative objects (56.15%), commercial real estate (53.31%), services (40.40%), transport sector (37.14%), production (41.03%), financial sector (36.39%).

## Discussion

Obtaining a reliable valuation of property in Ukraine is guaranteed through the market mechanism and the development of a private institute of appraisers. Evaluators use revenue, cost, and comparative approaches to valuation. This practice is in line with the practice of EU countries. Compared to the EU countries, Ukraine has developed an effective market methodology for pricing by adopting the best practices in managing the valuation processes, and automation of sales processes ensures transparency of valuation. Therefore, Ukraine's experience may be indicative of privatization success and short-term and long-term effects, which are overwhelmingly characteristic of the western countries [10].

The downside of small-scale privatization processes is the lack of governance practices in local governments, which correlates with similar processes in the United States of America, the United Kingdom, New Zealand, where municipal property management practices have been limited due to the lack of managerial experience, strategic vision and lack of professionalism of management managers. In Ukraine, the lack of management practices can be compensated by an automated electronic system and clear transparent procedures. Local governments are actively conducting an inventory of property, although in some cases property is not accounted for in financial reporting, which is the prerequisite for effective managerial decisions. On the other hand, the mass assessment of small-scale privatization objects indicates the effectiveness of management procedures. The open evaluation registers of the Unified Database of Evaluation Reports attests the success of the appraisals.

Ukraine's experience is similar to that of Sweden, which also involved the mass evaluation, automation of price formation grounded on market mechanisms and development of competition [19]. The transition economies, such as Georgia, also integrate the expertise into the management of privatization and evaluation processes. This

resolves the issues of overestimation or underestimation of the objects' value and unprofessional assessment by market participants [11]. Therefore, the protection level of foreign and local investors is maximized, for the reason that the open electronic registers of new property owners provide protection of the title to the acquired objects. Accordingly, the risks of acquiring state property are reduced, which brings about the pumping of local budgets and fiscal efficiency.

The main risks of property valuation in Ukraine may be due to the formation of the market environment, contradictions and unreliability of information about the appraisal objects, the immaturity of financial markets. At that, the risks are reduced due to automation, which provides electronic mechanisms of privatization processes.

The integration of international property valuation standards in Ukraine provides a solution to the problem of conceptual differences in approaches and methods of accounting and valuation. The effective state valuation policy is a priority in the course of privatization, which should include deterrent measures and restrictive actions in various institutional and economic market conditions [9]. Despite the budget deficit, the crisis period of 2020 and the practice of curbing privatization in Ukraine prove the relevance of management policy, which reduces the risks of significant underestimation of state property.

## Conclusion

The conducted research makes it possible to draw a number of key conclusions about the processes of small-scale and large-scale privatization in Ukraine. First, the restrained policy of privatization in the context of the crisis of 2020 and at the same time active processes of inventory and valuation of state property will have a favorable impact on revenues to local and state budgets. Second, the policy is complemented by effective electronic and open methods of privatization, which ensures competition in the market, that entail price increase based on market mechanisms. Property valuation takes place through an electronic trading system, and therefore is formed by the market. Informal contractual agreements are absent or minimized, which means a reduction in the level of political influence on privatization processes. Third, the fiscal effects of privatization in the short-term and medium-term perspective will increase local and state budget revenues. In the long run, we should expect an increase in the tax efficiency of privatized facilities.

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## PROSPECTS FOR THE CHINESE YUAN AS A GLOBAL CURRENCY

Huang Xizhe<sup>56</sup>

### Abstract

The processes of globalization taking place in the world economy dictate the need for a detailed study of the possibility of transforming the international financial architecture through the introduction of new forms of world currencies. For a long time, individual countries called on the world community to resist the hegemony of the dollar in relation to other currencies, and already in 2006, there was a clear trend that the international monetary and financial system was no longer unipolar and the euro and yuan should be the closest competition for the dollar in the long term. In the present study, a relevant analysis of the reasons why the traditional yuan managed to supplant the us dollar as the "world reserve currency", as well as identifying new trends and prospects of the formation, development and legal regulation of the digital yuan as the world's first digital currency. Research methods: the article is based on an integrated approach to research, as it covers a wide range of issues underlying the identification of the dynamics and prospects of development of traditional and digital yuan as a world currency and issues related to the development of legal regulation of the digital yuan. To identify trends in the development of the digital yuan and the legal framework for its regulation, the methods of system analysis and synthesis, as well as the method of induction, were used. The results of the study: the features of the functioning of the modern system of international monetary and financial relations based on the global role of the US dollar as a world currency are revealed. Conclusions: it can be concluded that in the medium term, the US dollar will be able to maintain its leading position as the first world currency, but in the long term, its role as the first world currency is under immediate threat of new legally established digital currencies as a means of monetary circulation, among which the digital yuan is the leader.

**Keywords:** Chinese Yuan, Renminbi, Internationalization of the Chinese Currency, Digital Yuan, World Currency, US Dollar.

JEL: F60

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## Introduction

The article examines the currency of the Chinese yuan from the point of view of the breadth of its distribution in the world as a financial instrument, and also analyzes the prospects for using the yuan as a reserve currency. The yuan has been included in the list of reserve currencies not so long ago, but although it belongs to limited convertible currencies, it has a large international application, both in international trade and in the use of the yuan as a reserve currency (Wong 2020).

The study assessed the potential for further strengthening of the yuan in the international arena and strengthening its position as a world reserve currency, analyzed the current economic situation of the use of the yuan in the global currency and trade market and made forecasts for the prospects of expanding its zone of influence and use on the world stage.

Additionally, the article discusses approaches people's Republic of China (hereafter PRC) to the legal regulation of the production and use of the digital yuan in the country, in terms of which legal acts taken or are planned for the legalization of the digital yuan. Questions are also being considered about whether there are legal gaps in the legal regulation of the digital yuan and whether there is a need to fill such gaps.

## Materials and methods

The article is based on an integrated approach to research, as it covers a wide range of issues underlying the identification of the dynamics and prospects of development of traditional and digital yuan as a world currency and issues related to the development of legal regulation of the digital yuan. To identify trends in the development of the digital yuan and the legal framework for its regulation, the methods of system analysis and synthesis, as well as the method of induction, were used.

## Results

In 2006, researchers predicted a great future for the traditional Chinese yuan (Wong 2020; Kudryashova 2020). It should be noted that such forecasts were not unfounded. So, at the time of 2006, the share of the PRC, according to the International Monetary Fund (hereinafter – the IMF), accounted for 5% of the world trade volume. At the same time, the average annual GDP growth in the country since 1979 was about 9%, and if such trends continue, it was predicted that by 2010, China could reach the level of the United States in terms of GDP.

In addition, in 2006, China ranked first among the key Asian countries in terms of its share in world exports (4.6%) and had the largest surplus in absolute terms. At the same time, if we take into account the fact that ethnic Chinese also controlled the predominant majority of private capital in Thailand, Indonesia, Malaysia and the Philippines, we can say that the real share of the PRC in the world economy actually exceeded the figure of 4.6%. The fact that the PRC is the only country in the world that not only has several official currencies: the yuan, the pataku, the Hong Kong dollar and the Taiwan dollar, but also has the potential to independently play the game on the world market, including independently organizing processes in the global financial sphere in its own interests, was also very important. The development of the yuan in the world currency market was also facilitated by the fact that in 2005 China became the absolute record holder in terms of attracted foreign direct investment (Cohen 2012; Shchegoleva and Malsagova, 2019; Quero 2020).

Now we focus on the weaknesses of the traditional yuan. The only "weak" point of the traditional yuan at the time of 2006 can be called stock markets, which were not unfamiliar with securities denominated in yuan. Thus, in 2006, it was already possible to talk about the formation of a stable zone of the traditional yuan, in which the yuan acted as a full-fledged collective currency. Almost 15 years have passed since 2006, and the need for a detailed study of the prospects of the Chinese yuan as a world currency, taking into account the trends in the introduction of digital currencies, is becoming even more urgent. At the same time, such a detailed study should be carried out on the basis of new realities, taking into account not only the development of the traditional Chinese yuan as a world currency, but also the development of the digital yuan, as the only partially tested and legally recognized digital currency in the world (Quero 2020; Wang and Gao, 2021).

The author deliberately taken periodicals dynamics of the yuan since 2006, in order to see how the traditional role of the yuan in China and in the world, and why traditional Chinese Renminbi still has not become the first global currency. The mistakes of the past will allow us to outline the development trends of the Chinese currency in the future, draw important conclusions and protect the country from mistakes in the present.

From 2006 to 2021, the role of the traditional yuan in the global economy changed depending on various factors (there were ups and downs), while the role of the US dollar remained stable. So, if for almost a decade (in the period from 2003 to 20) the yuan was still trying to fight with the European currency for the right to be first after the US dollar, then by 2014 it became clear that the euro would take the place of the second most important currency for a long time. The strengthening of the yuan began in 2018 after the launch of a number of initiatives by the Chinese authorities to improve its global status. However, as of the beginning of 2021, the international use of the renminbi remains significantly below the peak levels of 2015. One of the most popular indicators of currency internationalization is the role of such a currency in international payments, and the Chinese yuan is no exception (Figure 1).

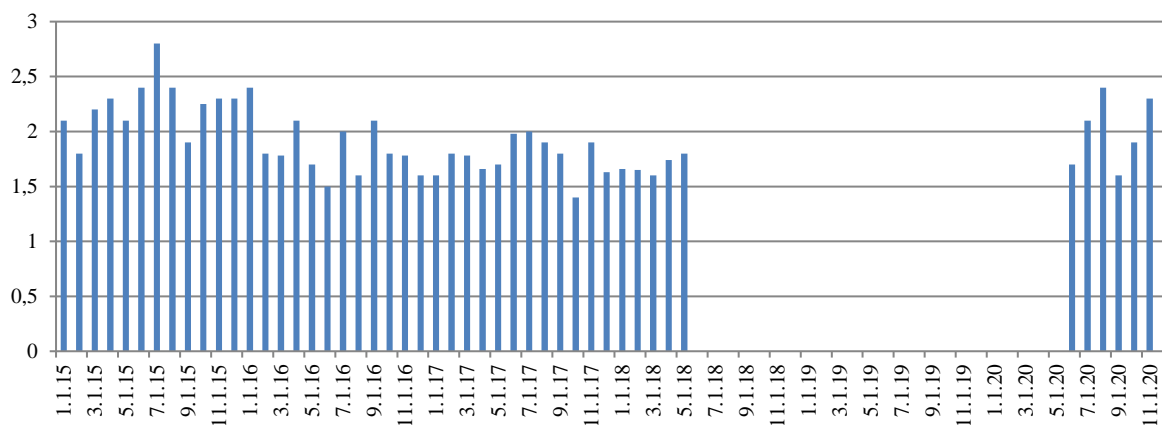


Figure 1. Change in the share of the yuan as an international payment currency (%) (Yuan et al. 2020)

Data from the international interbank information transfer and payment system, which allows financial institutions around the world to send and receive information about financial transactions in a secure, standardized and reliable form – SWIFT-shows that the average share of the yuan fell from 2.2% in 2015 to about 1.8% in 2020, despite the fact that the yuan continues to be the fifth most used currency in international payments. If we analyze the composite index of the global role of the yuan (showing the value of the yuan in the international currency market), it suggests that in the medium term, the Chinese traditional yuan will be less strong than in 2015 (Figure 2).

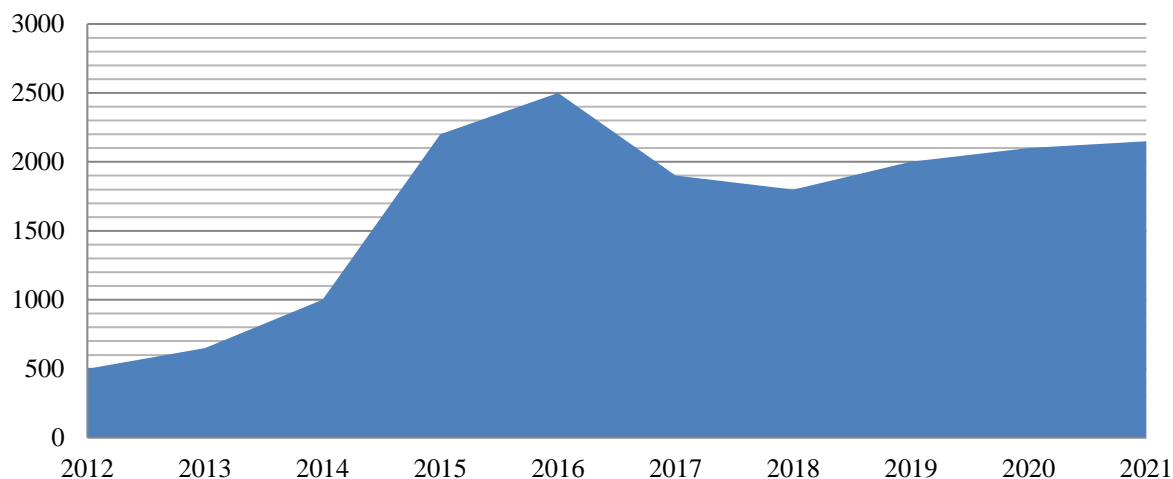


Figure 2. Change in the composite indicator of internationalization of the yuan (index) (Yuan et al. 2020)

Based on the analyzed data, an objective question arises, which can be expressed as follows: what is the real reason why the Chinese yuan lost its position in the international currency basket and why the yuan lost the "palm" of the single European currency. In response to this question, we immediately emphasize that the international role of the currency (in relation to the yuan) on the world stage actually decreased immediately after it was included in the special basket of drawing rights. Such a basket is an artificially created means for payments and accumulation of reserves, the issuer of which is the International Monetary Fund (IMF). Although the use of the renminbi as the denomination currency for international bonds and reserves increased markedly in 2019, the RMB's share of less than 2% in global foreign exchange reserve portfolios, outstanding international bonds and international liabilities remains small overall (Figure 3).

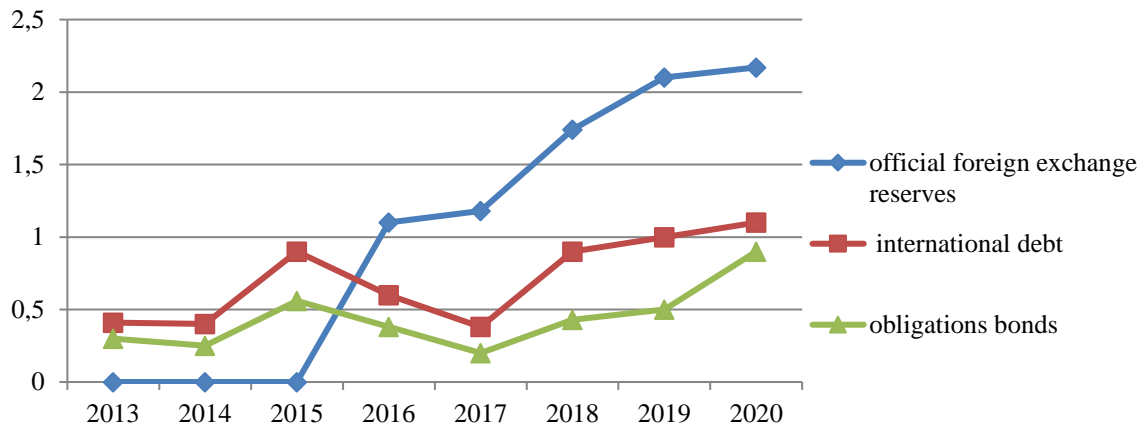


Figure 3. Change in the share of the yuan in the total volume of international debt obligations, bonds and official foreign exchange reserves (Ma et al. 2018; Garić and Filipović, 2019).

The Chinese authorities, however, did not lose hope for the strengthening of their currency and wanting to bring the traditional yuan to a new level in the international monetary and financial system, took initiatives to stimulate the international use of the yuan. The essence of the initiative proposed by the Chinese authorities was to launch several projects in 2017 and 2018 under the auspices of the Belt and Road Initiative (Belt and Road Initiative) to support the use of the yuan as a billing currency for trade and create direct trade routes between China and other countries. The Shanghai International Energy Trading Centre launched a yuan-denominated oil futures contract in 2018 with the aim of raising it to a benchmark status in the Asia-Pacific region. It should be noted that such an initiative has produced a tangible result – so within a few months, the volume of trading on the contract reached levels not too far from those recorded in more established benchmarks, such as WTI or Brent (Figure 4).

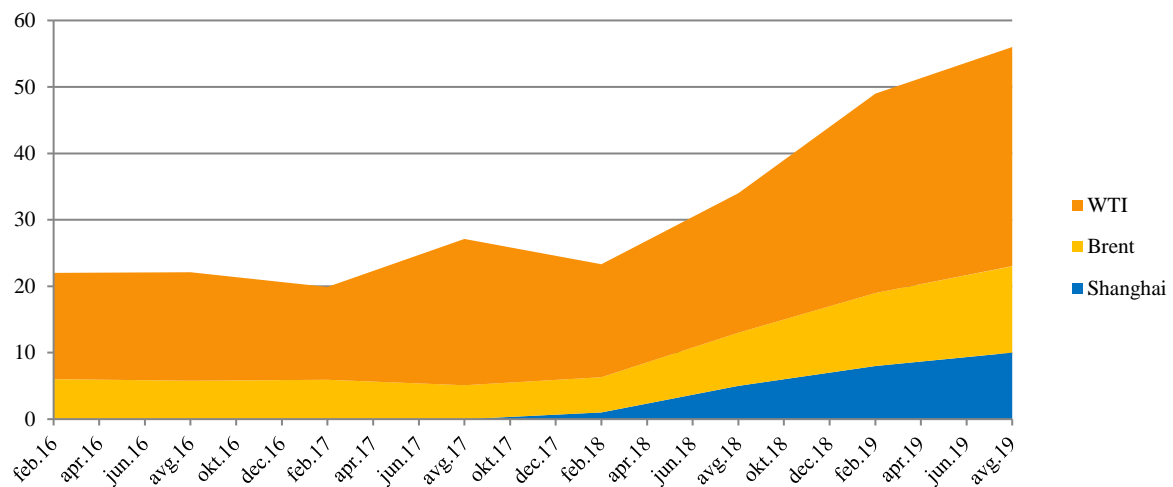


Figure 4. Change in the share of the yuan in certain future oil benchmarks (Ma et al. 2018; Garić and Filipović, 2019)

It should be noted that oil futures contracts and the financing of international projects by the Chinese currency are not the only measures of the Chinese authorities aimed at strengthening the yuan in international markets. So, the Chinese, for example, in order to strengthen the role of the yuan, have developed plans for financial products traded directly in yuan. In particular, we are talking about the Bond Connect trading platform, which allows foreign investors to directly invest in the Chinese interbank bond market. In the future, if the current trend of support for the yuan continues, including from the Russian Federation, the yuan will not only strengthen in the international monetary and financial system, but also move the US dollar from some leading positions. The expansion of the Chinese banking sector, which since 2016 has total assets exceeding those of European banks, especially in developing countries, which contributes to the financing of international trade in yuan, is also important for strengthening the yuan.

The next direction in terms of strengthening the national currency, which the Chinese authorities are engaged in, is the promotion of the digital yuan – at the moment, the first cryptocurrency developed at the state level and found the appropriate legal regulation, even if not completely perfect.

On September 21, 2020, the People's Bank of China announced through its official news outlet that all preparations for the launch of China's first state-owned digital currency have been completed. In particular, the article "New development opportunities for the official digital currency of China", published on September 19 by the People's Bank of China in *Financial News*, states that "technical preparations for the introduction of the digital yuan have been completed and everything is ready for its full deployment. It should be noted that the People's Bank of China has been considering the possibility of issuing its own digital currency for a very long time. Back in 2018, the former head of the People's Bank of China, Chinese economist Zhou Xiaochuan, in an interview with one of the financial publications, focused on the fact that the People's Bank of China has been conducting research on digital currency for more than three years, and the Institute of Digital Money was created to conduct such research and develop the national Chinese digital currency. At the same time, on the basis of the Institute of Digital Money, in October 2017, trial runs were conducted of the algorithms necessary to offer the national Chinese digital currency, which will have the same legal status as the Chinese yuan, the only fiat currency issued by the People's Bank of China (Kudryashova 2020; Wang and Gao, 2021).

Let us pay attention to a certain chronology of events concerning the practical implementation of the digital yuan and the consolidation of its legal status. So, as of April 2020, the People's Bank of China has filed 22 patent applications covering the issue of digital currency and 65 applications for the circulation of digital currency. In other words, a full-fledged chain has been created that allows the digital currency to function.

At the end of April 2020, the People's Bank of China announced that it had started internal testing of the digital yuan in selected regions of the country: Shenzhen, Suzhou, Xiongan and Chengdu, as well as at the Winter Olympic Games venues. In early August 2020, reports emerged that at least four of the six largest state-owned banks had begun testing digital yuan wallets, including the Agricultural Bank of China (ABC), ICBC, Bank of China (BOC), and China Construction Bank. This allows us to conclude that in 2020, China began large-scale testing and gradual implementation of the digital currency (Yuan et al. 2020).

It should be noted that support for the digital yuan in China is carried out at the highest level. For example, the Beijing municipal authorities say that the digital yuan will form the basis of the digital economy, which in turn will become a key focal point for China for the upcoming urban free trade zone. It should be noted that the support of the Beijing authorities for the actions and regulations of the People's Bank of China to create a digital currency is not accidental. This is due to the fact that the central government of China has provided its support for the project to create a "National Demonstration Zone of Expanded Opening of the Service Sector" and a "Pilot Free Trade Zone", focused on technological innovation, opening up the service sector and the digital economy (Ma et al. 2018; Yuan et al., 2020).

It is clear that the Beijing free trade area will focus on digital trade and technological innovation, as well as on three areas arising from the globalization of the world economy: the pilot digital trade area; the exchange of big data; and the regulation of cross-border data flows. In addition, the Beijing authorities have repeatedly emphasized that Beijing will seek to achieve "leading breakthroughs" in the use of digital currency (digital yuan), starting with the venues for the Winter Olympics. As you know, venues for any Olympic Games are a great opportunity to introduce innovations that will then allow not only the population of a particular country, but also users around the world, to evaluate the benefits of the proposed innovations, and the digital yuan is no exception.

As for the legal support of the digital yuan, the People's Bank of China has recognized the digital yuan as a legal digital currency. The digital yuan is equivalent to banknotes or coins, has all the same value characteristics and legal support in the form of appropriate legal regulation, and maintains a controlled level of anonymity.

From a legal point of view, the fact that the People's Bank of China recognizes the digital yuan as a legal digital currency does not mean that the digital currency has the opportunity to be circulated in the national monetary system, since it is necessary to legislate the digital yuan as an official currency. At the beginning of 2021, the relevant law has not yet been adopted. Nevertheless, the People's Bank of China, in order to give the digital yuan an appropriate legal status, back in October 2020, developed and posted for public viewing a law legalizing the digital yuan and prohibiting digital currencies issued by anyone else. In addition, in October 2020, the People's Bank of China started public discussion of the new draft law. In order to understand what are the features of the legal regulation of the new Chinese digital currency and what are the risks.

## Discussions

Analyzing the prospects of the traditional Chinese yuan as a world currency, it should be noted that only time will tell whether the measures taken by the Chinese government to strengthen the role of the traditional Chinese yuan will be able to increase the global attractiveness of the yuan and take the third place among the world's collective currencies, or completely displace the dollar and euro from their positions and take a leading place in the world. Additional reforms aimed at opening up China's capital account and moving to a market-based exchange rate determination are also likely to make a difference for the traditional yuan to reach its real potential. No less

important is the fact whether the Chinese will in the medium and long term need to bring the traditional yuan to the world stage as the first world currency, if attempts are made to bring the digital Chinese yuan – currently the first digital currency (cryptocurrency), which is not only developed at the state level, but also supported by the regulatory framework of its functioning in the market.

The answer to this question is not clear, because everything that happens in the Chinese financial system is difficult to analyze, due to the opacity and rapid development of such a system. Every ten years (and we could clearly see this in the development of the traditional Chinese yuan), China is undergoing major changes in the regulation, structure and functioning of certain aspects related to the financial industry. For example, back in 1973, the private financial sector in China was absent as a category, and all banking activities were carried out through the People's Bank of China (Wong 2020; Nenbee and Orji, 2021).

A contributing factor to the opacity of Chinese monetary policy is that China's national, regional, and local governments play a much greater role in guiding the activities of banks and other financial intermediaries than in the same countries of the European Union or the United States. This does not allow us to predict reliably and accurately the future of the digital currency. Taking into account the fact that at the moment the attitude to cryptocurrencies (which includes the digital yuan) central banks and economists in many countries are skeptical, and it is impossible to assess the potential of the digital yuan based on real indicators, primarily due to the lack of such indicators in the public domain (all data on the implementation of the currency is hidden) (McNally and Gruin, 2017).

However, some researchers see the potential of cryptocurrencies (regardless of whether it is a digital yuan or any other digital currency), arguing that a digital currency can "weaken the dominant influence of the US dollar on world trade", and building a future financial architecture around cryptocurrencies (for example, blockchain) can shift the dominance of the dollar in credit markets (Quero 2020).

It would be obvious to assume that if the world uses a digital currency such as the digital yuan – which is legally backed-for international trade and for access to international debt, the effects of the US economy's swings will be less severe. In addition, it would help minimize the dollar-induced volatility of capital flows to emerging economies, which often trigger crises.

It should be noted that in science, the discussion on the problem of replacing the US dollar with cryptocurrencies has been going on for a very long time, since the new world currency should encourage existing cryptocurrencies, such as bitcoin or litecoin. However, in reality, there is almost no chance that the central banks and governments of the world will formally accept any existing cryptocurrencies on the market. The introduction of cryptocurrency, in our opinion, is possible only if such a currency is recognized at the state level, and here the digital yuan may be the first currency that may not displace the US dollar, but will significantly shake its position (Garić and Filipović, 2019; Wong 2020).

The dubious attitude towards existing cryptocurrencies is due to the fact that cryptocurrency is impossible to control, and the decentralized nature of bitcoin and other cryptocurrencies makes this impossible. In some countries, of course, attempts are being made to control cryptocurrencies at the state level, but this is still not enough. For example, in the UK, the general rules of currency and credit relations apply to cryptocurrencies (any transactions in cryptocurrency are processed in the same way as regular transactions) (McNally and Gruin, 2017).

At the time, the Governor of the Bank of England, Mark Carney, proposed a global digital currency – a "synthetic hegemonic currency (SHC)" – one that would not be tied to any one nation, but supported by a diverse basket of assets or paper currencies. As another cryptocurrency that should reduce the impact of the US dollar on the international monetary and financial system, the collective currency of the informal BRICS grouping is considered (Ma et al. 2018; Kudryashova 2020). However, neither of these positions were heard and at the moment we have the only legally fixed cryptocurrency-the digital yuan. Digital Yuan state blockchain. It differs from the usual cryptocurrencies, and unlike them, it is not anonymous, but at the same time it is more reliable thanks to a decentralized "ledger"registry. Such a currency cannot be forged or subjected to a hacker attack. The electronic yuan is also available for offline transactions – by attaching one phone to another, you can transfer money like cash-in a transparent and secure way.

In the current situation, the digital yuan has a chance to become the world's first state-owned cryptocurrency, the release of which will make China the flagship of the development of this sector of state financial turnover. However, there is almost no information about the new currency and it is quite difficult to understand the prospects of the digital yuan at the moment.

At the same time, we know about some facts about the digital yuan and that it is being actively tested. Also recently, access to the electronic wallets of the new yuan was opened for a couple of hours. Many users managed to evaluate the wallet interface and even make several transactions. But then, without explanation, the wallets were closed. If China succeeds in successfully deploying the digital yuan across China, expanding it to the rest of Asia and even parts of Africa, the world's second-largest economic power could take the top spot as the world's reserve currency power (Kudryashova 2020).

If more and more central banks use their foreign exchange reserves in Chinese yuan rather than US dollars, China will be able to print (or rather generate) huge amounts of money without experiencing significant yuan inflation. At the same time, if countries can borrow using the digital yuan, rather than US dollars, then in the medium term, this approach will help countries diversify their existing debts and wean themselves off the dollar (Wang and Gao, 2021).

The advantages of the Chinese digital yuan also lie in the fact that an appropriate legal framework is created for such a currency. So, as has clearly been shown the bill on digital yuan by which changes are made to the current Law "On the people's Bank of China" for the first time in world practice set digital currency on one place with physical currency, the digital yuan, after the adoption of the relevant amendments will be allowed to circulate and converted as a physical currency, all without exception are forbidden to release this currency and in violation of the legislation in terms of issue and circulation of digital yuan accommodate a tough responsibility. Such legislative developments, in our view, are designed to create a strong legal framework for the management of digital yuan and its release in China and prevent the risk of virtual currencies (Quero 2020).

With regard to the ban on organizations and individuals from producing or issuing digital currencies set out in the Digital yuan bill, such a ban seems quite obvious, since if virtual currencies issued by the private sector are circulated on the market together with the digital yuan issued by the People's Bank of China, the management of the money supply will become difficult. Nevertheless, it is still difficult to draw any unambiguous conclusion about the true purpose of the ban on the issuance of digital currencies. It can also be assumed that the ban on the issuance of cryptocurrencies is the first step towards strengthening the status of the national digital currency in the country, by banning other cryptocurrencies that can be completely banned in the country after the full implementation of the digital yuan and the adoption of the bill on the digital yuan (Kudryashova 2020).

As for the establishment of penalties for violations of the legal norms on the digital yuan, such innovations are seen as aimed at the need to improve the funds of the People's Bank of China, aimed at eliminating financial violations in order to ensure a balance between the growth of the country's economy and the prevention of legal risks in the financial sphere, and The lack of proper legal regulation regarding the application of liability measures for financial violations, as is known, is the cornerstone of many world countries – new types of financial violations appear exponentially, many of them are directly related to fraudulent actions of individuals using information and communication technologies, and administrative and criminal liability measures cannot adequately guarantee legal protection to either society or the state. Therefore, any changes in monetary policy in terms of digitalization of policy should be accompanied by appropriate measures of responsibility for violations in the field of such policy (Garić and Filipović, 2019).

The draft law on the digital yuan, as noted, also improves the monetary policy instruments in Articles 4, 25 and 34 by moderately increasing the flexibility of monetary policy instruments and ensuring the scientific, sound and effective regulation of monetary policy. In order to fill the institutional gaps in macroprudential policy, the bill establishes the framework of macroprudential policy, clarifies the objectives of macroprudential policy, focuses on strengthening countercyclical regulation and permeation regulation, and improves the tools of macroprudential policy, such as countercyclical capital buffers, risk reserves, and stress tests for financial institutions (Ma et al. 2018; Nenbee and Orji, 2021).

The only problem of the digital yuan is the insufficiency of the adopted amendments in terms of its legal regulation, since for the full functioning of the digital currency, a whole set of regulatory legal acts is also needed, which will also regulate the features of mining, the organization of the issue and circulation of the digital yuan by the People's Bank of China. In addition, the potential problems with the digital yuan reinforce the need to issue regulatory legal frameworks governing the supervision of the digital currency by the People's Bank of China – such acts will fully provide legal guarantees for the digital yuan being introduced as a full-fledged means of payment not only in the Chinese, but possibly in the global economy (Yuan et al., 2020).

## Conclusions

The features of the functioning of the modern system of international monetary and financial relations allow us to conclude that such a system is currently based on the global role of the US dollar as a world currency. However, a detailed analysis of the present situation of traditional and digital yuan Renminbi in such a system, allows you to identify and oceanity further prospects of development of traditional and digital yuan as a world currency, given the improvement of the legal regulation of such currency, as well as the possibility of replacing the us dollar with a digital yuan.

So, in the medium term, the US dollar will be able to maintain its leading position as the first world currency, but in the long term, its role as the first world currency is under immediate threat of new legally established digital currencies, among which the digital yuan is the leader. First, because the digital yuan will become the only global currency that has the appropriate legal status and is equated to the national currency in the short term. Secondly,



because the first practical tests of the digital yuan in China were successful. Hence, it can be assumed that if the practical large-scale launch of the digital yuan, projected in 2022 at the Winter Olympics in Beijing, is successful, then more and more central banks will use their foreign exchange reserves in digital Chinese yuan successfully passed the test and have the appropriate legal status, and not in US dollars. At the same time, if countries can borrow using the digital yuan, rather than US dollars, then in the medium term, this approach will help countries diversify their existing debts and wean themselves off the dollar, and the world's second-largest economic power can take the first place as a power of the world's reserve currency.

The only problem of the digital yuan is seen as a failure of the adopted amendments in terms of its legal regulation, because for the normal functioning of the digital currency seems to lack the introduction of the legal digital currency to circulate and be converted as a physical currency as well as the legislative ban on illegal release of the digital currency and the establishment of a system of fines for violations in the sphere of circulation and issue a digital currency. So, it seems necessary to develop a whole set of regulatory legal acts that will also regulate the features of mining, the organization of the issue and circulation of the digital yuan. In addition, the potential problems with the digital yuan reinforce the need to issue regulatory legal frameworks governing the supervision of the digital currency by the People's Bank of China. However, given the General trend of the development of Chinese monetary policy aimed at improving the two-component regulatory framework and the mechanism of counter-cyclical monetary policy and macroprudential policy, the adoption of the relevant legislation in the medium term, no doubt.

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### **III PART. EDUCATION AND HUMAN RESOURCE MANAGEMENT**

## STUDYING SYNTACTIC FEATURES OF ADVERTISING TEXTS' HEADINGS

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**Svetlana Osadchaya**  
**Olga Gerasimenko**  
**Nikolai Dolinsky**

### **Abstract**

The article describes the results of observation and a survey to assess the perception of various headings of advertising texts. The study involved 12 subjects who, using Pupil eyewear glasses and software from Pupil (Germany), looked at 6 different headings oriented to the left or right hemisphere of the brain. According to the results of processing the observation results, the possibility of enhancing the attractiveness of the headings through the use of syntax focused on the preferential activation of one of the cerebral hemispheres was not confirmed. Conclusions are drawn on the advisability of using short exclamation or unallocated types of promotional offers.

**Keywords:** Heading, Advertising Text, Syntactic Features, Oculographic Research

JEL: M37

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## Introduction

Educational Dictionary of Advertising Terms and Public Relations edited by E.E. Topilskaya [1] contains a fairly complete definition of the term «advertising text» - this is a message about an individual or legal entity, goods, ideas and undertakings, intended for an indefinite circle of people, designed to generate or maintain interest in them and facilitate promotion and implementation.

The main purpose of the advertising text is to manage behavioral scenarios and motives of consumers, for this it should solve the following tasks:

- attract the attention of the message recipient to the advertisement itself;
- arouse interest, increasing the likelihood that the addressee will consciously familiarize themselves with the advertising material or most of it;
- ensure the occurrence of the required behavioral reactions or various emotions of the addressee, provoking a desire to make a purchase;
- memorized to save in the memory of the recipient of the received advertising information.

The listed tasks are recommended to be achieved due to the specific structure of the advertising text:

1. **Headline** is a brief reflection of the essence of the advertising message, designed to capture the attention of the reader. It largely determines the success of the whole work, as it is the first link in the advertising structure with which a person interacts. This aspect is reflected in detail in the AIDA model [2].
2. **Subheading** is a connecting block between the heading and the main text of the advertising message, necessary for the development of interest in advertising.
3. **Lead** or the first paragraph of the advertising text is used to enhance interest and create a desire to be acquainted with the main part of the text.
4. The **main text** is a description of the advertising object, according to the lexical and semantic content corresponding to the requests of the addressee, takes up to 85% of the advertising text [3].
5. **Echo phrase (slogan)** is a simple phrase that reflects the essence of the advertising text, stimulating its memorization and the possibility of subsequent identification in the information field.

Despite the exhaustive logic of the processes for preparing the advertising text in practical activities, this work is one of the most complex and determines the high risks of implementing the company's marketing communications program. Difficulties are caused by the variability of grammatical and lexical units, stylistic devices, syntax, the use of elements of various sign systems, as well as the combination of the text itself with various visual elements of advertising [4].

In other words, a unique selling proposition or other advertising statement of a company can have dozens of presentation options. The choice of a specific one is carried out mainly based on the use of various techniques (for example, testing materials in focus groups), recommendations from text improvement services (for example, «Glavred») or through intuitive decisions of responsible persons. Moreover, the range of evidence-based decisions on the preparation of advertising texts is extremely limited. This is due to the fact that, in the scientific aspect, issues of the language of advertising are poorly understood. In the national literature over the past 20 years, works devoted to the structural analysis of advertising texts have dominated. At the same time, researchers do not use common methods of analysis; freely interpret the logic of creation and the semantic content of such texts without receiving comments and clarifications from direct developers [e.g. 5, 6]. And, most importantly, they do not provide data on the economic effect or overall effectiveness of the studied advertising texts. Quite a lot of articles are devoted to the theoretical analysis of discourse or the linguistic interpretation of advertising texts [e.g. 7, 8, 9, 10] that do not have direct practical applicability.

## Purpose of Research.

In this regard, it is of interest to study the syntax headings of the advertising text as the most important part of the advertising text, and to identify the most preferred formulations that take into account the peculiarities of the perception of textual information by a person.

Based on this, the research hypothesis is formulated - various forms of proposals that reflect the essence of the advertising message in the headline do not have the same ability to attract the attention of representatives of the target audience.

## Methodology

In order to test the hypothesis, a pilot neuromarketing study was conducted in the period from September to October 2019, which consisted in determining the sequence and duration of eye contact with various conditional advertising headlines and comparing the results of observations with subjective assessments of the material seen by its participants.

The material base of the experiment: glasses-trackers Pupil Headset 200 Hz Bino (Germany); Lenovo YOGA 530-14IKB laptop (China), BENQ GW2780 27 monitor (China); computer mouse DNS ES-300G (China) software for recording and processing signals Pupil Capture, Pupil Player (Germany).

Selecting test subjects, we adhered to uniform criteria used in all neuromarketing studies and experiments. The number of participants - 12 people (50% - men, 50% - women) aged 25-37 years with higher education, permanent work, different marital status and income per household member above the average wage in the region of 2 or more times. Subjects with the indicated socio-demographic characteristics have formed consumer preferences, individualized criteria for choosing goods (services) [11] and sufficient solvency.

## Results and Discussion

*At the first stage*, conventional headings of the advertising text were formulated. Money acted as an object of advertising, as a product, to a certain extent, possessing equal high perceived value for all participants in the observation.

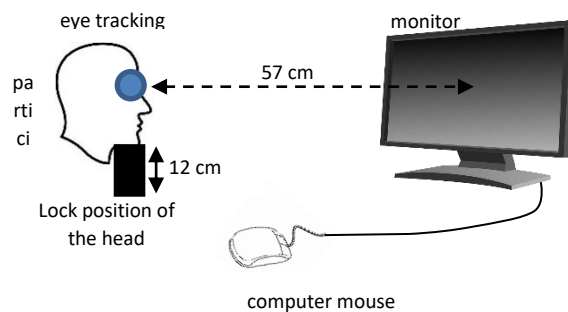
The syntax of the headings of the advertising text is aimed at activating one of the cerebral hemispheres [e.g. 12, 13]. The left hemisphere, among other things, specialized in speech, writing and reading, unlike the right one - processing non-verbal information. In the left hemisphere are “shells” of words, and in the right are information to fill them with meaning. The vocabulary of the left hemisphere can be expressed in verb forms, and the vocabulary of the right hemisphere is more substantive and gravitates to nouns.

In the scientific world there is ambiguous interpretation of which of the hemispheres is dominant in making the final decision, and is there such a dominance in principle, but at different periods of time the role of the dominant was assigned to the left or the right hemisphere. In this regard, we formulated the headings of the advertising text theoretically capable to affect the left or right hemisphere of the human brain in a more pronounced way (table 1).

*Table 1. The specification of the conventional headings of the advertising text, focused on the left and right hemispheres of the human brain*

№	THE LEFT HEMISPHERE OF THE BRAIN		№ п/п	THE RIGHT HEMISPHERE OF THE BRAIN	
	Wording	Type of offer		Wording	Type of offer
1	«Take the money!»	Exclamation	4	«Your money»	Unextended
2	«Where do you get the money?»	Interrogative	5	«People went for the money»	Narrative
3	«Go for the money»	Imperative	6	«The long-awaited money came»	Extended

*At the second stage of the study*, there was an instrumental fixation of the time and duration of the participants' gaze with the use of IT trackers and the selection of the most interesting headline using a computer mouse (Fig. 1).



*Figure 1. Diagram of the observation process*

After conducting a briefing on the monitoring procedure, its goals and safety precautions, the participants were asked to get acquainted with the headings on the screen as quickly as possible (within 10-15 seconds) without thinking about their contents, and click on the most attractive at the moment. For leveling the influence of the F-

shaped reading template (people tend to start viewing (reading) horizontally from left to right from the upper left point of the surface containing the information) formulated advertising headers did not appear in a grouped form and randomly on the monitor screen (Fig. 2).

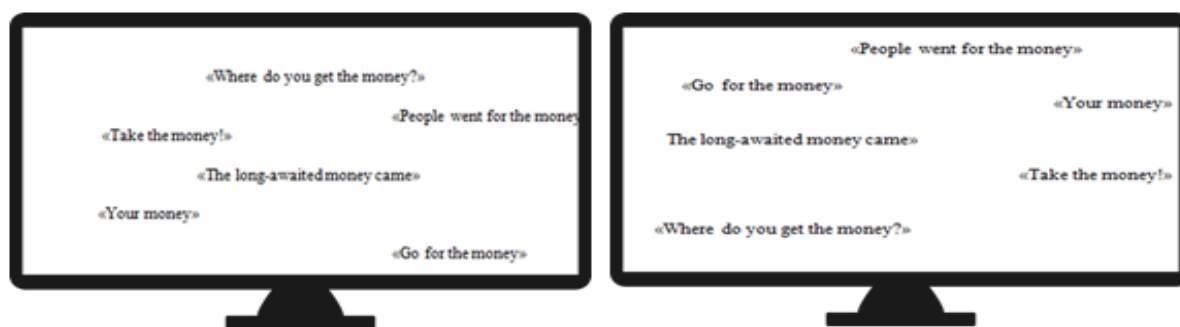


Figure 2. Diagram of options for presenting information on the monitor during observation

In the preparation of the headings, the sans serif font Arial was used, and the size is 18, which, according to the authors, adequately corresponds to the used headsets (typography) of advertising texts in print media and on the Internet. The boundaries of the text were not indicated by frames to reduce the influence of the secondary visual cortex, oriented toward recognizing geometric shapes, and attempts to speed up the activation of the tertiary visual cortex, which is responsible for the «recognition» of the letters of the alphabet.

The procedure for demonstrating the headers was repeated three times in succession and had no time limits in the form of timers in order not to provoke a stressful situation and allow participants to make an informed choice, rather than clicking in a hurry on a random heading. Showing a new combination of headers began after clicking on the most preferred heading in the current version with a computer mouse.

In addition, the elimination of the time factor was required to increase the accuracy of the observation results, since with extremely fast eyeball movement, the used eye tracking glasses are not able to reliably capture the trajectory of the person's gaze and focus on the object.

At the third stage of the study, without the use of technical measuring instruments, the participants were asked to once rank the headings from 1 to 6 by the degree of attractiveness, where 1 is definitely interesting and attracting attention, 6 is the least memorable heading. Information for ranking was presented in tabular form on paper.

For greater uniformity of the data array in the further analysis, only three headers are taken into account, marked with serial numbers - 1, 2, 3.

The observation results are structured according to four parameters<sup>58</sup> (table. 2):

- 1) «first eye contact» is the frequency of fixing the first look of a participant in the observation on a specific heading (%);
- 2) «duration of eye contact» is the average time of fixing the gaze of a participant in the observation on each heading (sec.);
- 3) «heading clickability» is the frequency of the participant choosing a particular heading as the most attractive on the monitor screen using a computer mouse (%);
- 4) «priority of headings» is the frequency of getting a particular heading among the first three most attractive, according to participants (%).

Table 2. Structuring of observation results (rounding is taken into account)

Title	First eye contact,%	Duration of eye contact, sec.	Header clickability,%	Header priority,%
«Take the money!»	33	2,0	50	75
«Where do you get the money?»	8	1,5	8	33
«Follow the money»	17	1,0	0	25
«Your money»	25	1,5	25	75
«People went for money»	17	1,5	17	42
«The long-awaited money came»	0	1,5	0	25
Total	100	x	100	x

<sup>58</sup> The final results of the observation took into account the fixation of the gaze of participants on any heading lasting at least 1 second

The largest number of first eye contacts occurred with the «left hemisphere» heading «Take money!» (33%) and «right hemisphere» - «Your money» (25%). These headings were also among the leaders in clickability and ranking by observation participants by attractiveness.

On average, the total time spent studying the headers on the screen in one iteration was uniform, with the exception of two cases when it took the observers about 17-18 seconds. We attribute this to the fact that the participants sequentially read the headings themselves and the decision to choose a specific heading is not related to the direct duration of eye contact with it.

## Conclusion

Thus, as intermediate, due to a small sample of observations, it is possible to draw the following conclusions:

- 1) the hypothesis of the study as a whole is confirmed, not all forms of proposals for the advertising headline are highly attractive to the target audience;
- 2) the most interesting are the headings, consisting of two words, related to the exclamation and unextended type of sentences;
- 3) in a situation where a representative of the target audience pays attention to the headline, this is not enough for him to want to further get acquainted with the advertising material. To increase this probability, it is necessary to organically place a subheading that can enhance initial interest;
- 4) there was no significant dominance of the syntax of the header oriented mainly to the left or right hemisphere of the human brain.

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## MULTICULTURAL AND SOCIALLY RESPONSIBLE HUMAN RESOURCES MANAGEMENT IN MARITIME INDUSTRY

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### Abstract

The research objective was to study the features of multicultural and socially responsible human resources management in maritime industry in the practice of shipping companies in the context of cost optimization. Based on the concepts of multiculturalism, intercultural interaction of different nationalities, social responsibility and case study methodology, the author identified the features of the human resources management practices of shipping companies. The results demonstrate the legislative pressure of international, national requirements and standards on the integration of the concept of socially responsible business. Financial sanctions as a consequence of the development of legal policy to regulate the shipping industry force companies to take into account the environmental and social components of doing business. International shipping companies use a supportive approach in implementing the concept of social responsibility. It is determined that the concept of multiculturalism arises due to the need of international companies to find cheap labour in order to optimize operating costs. The negative effects of intercultural human resources management include additional costs of maintaining the physical and psychological well-being of staff to ensure the required level of professionalism, competence, reducing the risk of incidents, shipwrecks. It is proved that the concepts of multiculturalism and social responsibility in personnel management are aimed at cost optimization, and the side effects of implementation are the formation of a positive image, reducing the impact on the environment, additional incentives for employees.

**Keywords:** Multicultural Responsible Human Resources Management, Socially Responsible Human Resources Management, Crew of Marine Vessels, Maritime Industry, Crewing Company

JEL: D20, D26

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## Introduction

Shipping companies regularly face the need to reduce operating costs. The motives for crew formation and the effectiveness of human resources management include integration of the concept of multiculturalism, hiring sailors of different nationalities, forming multicultural crews on board the ship [16]. As a result, there are cultural problems of interaction in the management of such crews. The concept of social responsibility of shipping companies partially solves similar problems [16]. As a result, the scientific literature discusses the issue of socially responsible management of multicultural human resources. Industry players and shipping companies need to set socially acceptable standards of behaviour in relation to the workforce, and consider culture as a factor influencing the performance of multinational working groups (Graham, 2001). The HR policy should take into account the cultural differences of the working groups.

Failure to take into account cultural differences determines the level of efficiency of the ship's crew and can cause accidents due to the "human factor": psychological and psychophysiological differences of different nationalities.

According to the European Maritime Safety Agency (2020), 25,614 ships had accidents, 230 ships were lost, 665 serious catastrophes occurred, and 696 people died in 2011-2018. At the same time, 1/3 of accidents in 2011-2018 occurred due to human factors: "Slipping - Stumbling and falling of persons were the most frequent events with 2,921 cases (39.2%), followed by loss of control of machine (18.9%) and body movement [9].

The research objective is to study the features of multicultural and socially responsible human resources management in the maritime industry in the practice of shipping companies in the context of cost optimization.

## Literature Review

### Human resources management in maritime industry

Human resources management in the maritime industry is becoming more popular due to the development of technology [1], the need to increase the industry competitiveness [14], ensuring ship safety [15], in particular through the integration of new concepts of project team formation [4] and the formation of new approaches to life cycle optimization, as well as continuous management of assets and project resources [14]. New methodological approaches to the formation of quantitative and qualitative composition of crews solve the problems of increasing operating costs of the industry, ship accident rate and their safety, environmental pollution [24]. These approaches are based on maritime personnel management capacity building projects [15], and involve the use of statistics instead of human judgments and estimates. Data-driven decision-making (DDD) is a modern decision-making practice based on design principles [22].

### Multicultural approach in maritime industry

Economic crises have led to the transformation of shipping companies' operating strategies and reduced labour costs, including the attraction of cheap labour in Asia and Eastern Europe. For example, the supply of seafarers was 1,187 thousand employees (466 officers) in 2005, 1,371 thousand employees in 2010 (624 thousand officers) and 1,647.5 thousand employees in 2015 (774 thousand officers). According to a survey by the International Maritime Organization, the largest staff suppliers were China, the Philippines, Indonesia, the Russian Federation and Ukraine (2015). According to the five largest companies those countries were China, the Philippines, the Russian Federation, Ukraine and India [11; 12].

Crews of ships of different nationalities are not a new phenomenon, the globalization of the maritime industry allows hiring staff and form crews without obstacles. Various factors determine the composition of the crew, including language barriers, skills and competencies, origin, level of remuneration, ability to adapt. These factors can determine the psychological state of seafarers and may lead to discrimination, controversy and blaming, resulting in psychological disorders [21]. For example, religion can lead to interethnic conflicts on ships, so staff privacy policies should take into account religious affiliation [20]. The likelihood of estrangement and isolation increases as a result of the work of migrant seafarers on transnational vessels [17]. These psychological conditions can determine the performance of the crew as a whole, and the level of welfare standards of seafarers. As international and national standards are more focused on the environment, toughening regulatory requirements for the shipping industry, the welfare of seafarers remains a significant issue. This problem can be solved by developing a relatively low-level standards, which will increase the level of their integration by shipping companies [19].

Thus, the concept of multiculturalism, intercultural interaction of different nationalities and the concept of social responsibility are closely linked. This relationship is determined by the financial capacity and costs of companies for the welfare of seafarers and the environment protection from potential accidents and incidents on ships.

## **Socially responsible human resources management in maritime industry**

Social responsibility in human resources management refers to the minimization of social costs in the course of the company's activities to eliminate the negative effects on the environment and society. The scientific literature actively discusses the issue of corporate social responsibility in the maritime industry. This concept envisages measures to ensure sustainable economic development through management of human resources and local communities to improve the quality of life. The shipping company takes financial responsibility for the socio-environmental consequences of operation, predicting possible risks, costs to eliminate potential damage. The social responsibility of large shipping companies is part of the overall development strategy, which includes: assessing the quality of life and safety of staff, the impact of the industry on the environment, prevention of possible accidents, incidents and shipwrecks.

The scientific literature offers three approaches to the concept of social responsibility of the shipping industry: unfavourable, typical and supportive. Companies that strive to be competitive at all costs, minimize costs, use an unfavourable approach, increasing safety and quality risks in accordance with the principle of "non-standard operators". A typical approach involves following the principle of "simple compliance with requirements, standards and rules of the game" in the maritime sector in accordance with international law. The companies that apply the third approach complement standards and conventions with its own safety and quality rules, actively integrating socio-environmental issues and creating a balance between operational efficiency, business value and the interests of non-financial beneficiaries [16]. The shipping industry annually accounts for about 2% of greenhouse gas emissions, which increased by 10% in 2012-2018. The relevance of using typical approach and the supportive approach is growing: in 2020, the International Maritime Organization (2020) introduces additional measures to reduce greenhouse gas emissions by ships. These measures include strengthening the requirements for determining the types of vessels (containers, general cargo vessels), the integration of the concept of JIT Arrival (Just-In-Time) to maintain the operating speed of the vessel and reduce dockage.

The main drivers of integration of the concept of social responsibility are pressure on the supply chain of shipping companies, financial incentives, paternalism, the need to comply with regulatory requirements [18]. However, the shipping industry is more focused on environmental protection than the quality of life of staff [18]. The main reasons for this imbalance can be considered the policy of governments to impose sanctions and fines for potential emissions of harmful substances (for example, in the oil transportation). In fact, international and national environmental policies force the shipping industry to integrate social responsibility as part of the strategy through potential financial costs. Instead, the problems of intercultural staff interaction and quality of life "cost" shipping companies much less.

Thus, the optimization of financial costs remains the focus while implementing the concept of social responsibility or intercultural staff interaction. Optimization occurs through compliance with international standards for environmental protection, reduction of emissions of harmful substances or through the acquisition of environmentally friendly vehicles to improve the quality of service/reduce costs.

## **Materials and Methods**

This study is based on the concepts of sustainable development, multiculturalism, intercultural interaction of different nationalities, social responsibility. There is no research in the scientific literature on the relationship between these concepts and their integration into human resources management.

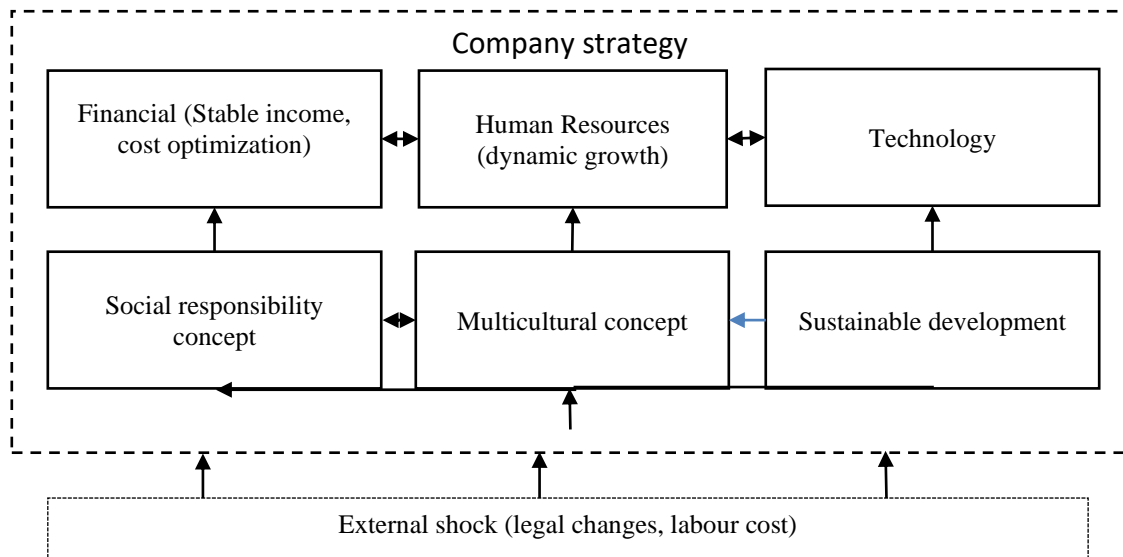


Figure 1. Integration of concepts of multiculturalism, intercultural interaction of different nationalities, social responsibility in human resources management

Source: compiled by the author.

Qualitative design of the study involves the use of case study based on content analysis of the official website of China COSCO SHIPPING Corporation Limited, the Company's Sustainable Development Reports for 2017-2018. In particular, 2017 Sustainability Report, 2018 Sustainability Report, 2019 Sustainability Report of China COSCO SHIPPING Corporation Limited were used [5; 6; 7; 8]. Sustainability reports contain information on human resources management in the context of a systemic need to optimize costs, so financial strategies provide support for income stability and forecasting possible financial risks. Sustainability Reports for 2017-2019 are analysed in terms of the basic concepts on which this study is based:

1. Corporate governance.
2. Management of sustainable development.
3. The Company's globalization strategy and strategic dimensions of activity.
4. Human resources management to ensure sustainable development: caring for the crew, occupational health and safety, staff development, protection of employee rights and interests.
5. Corporate culture (social dialogue, multiculturalism, social responsibility).

Non-compliance of the shipping company's standards with the regulatory requirements of international organizations and national governments entails risks of financial sanctions. Therefore, the concept of social responsibility involves the elimination of these risks with an emphasis on environmental and social components of doing business. The price of integration of these concepts is determined by the scale of activity of shipping companies.

## Results

### Human resources management in the maritime industry

The potential for improving the safety of operations at sea for ports and ships servicing passenger and cargo processes by creating a social and industrial environment called "safety culture". The problem of the development of the system of international division of labour has led to the evolution of navigation of a growing number of crews of international scale. Such crews have different levels of training and face the problem of language barriers, mental and physical peculiarities, traditions, customs and culture. These conditions reduce the level of controllability of crews, especially in emergencies (Figure 2).

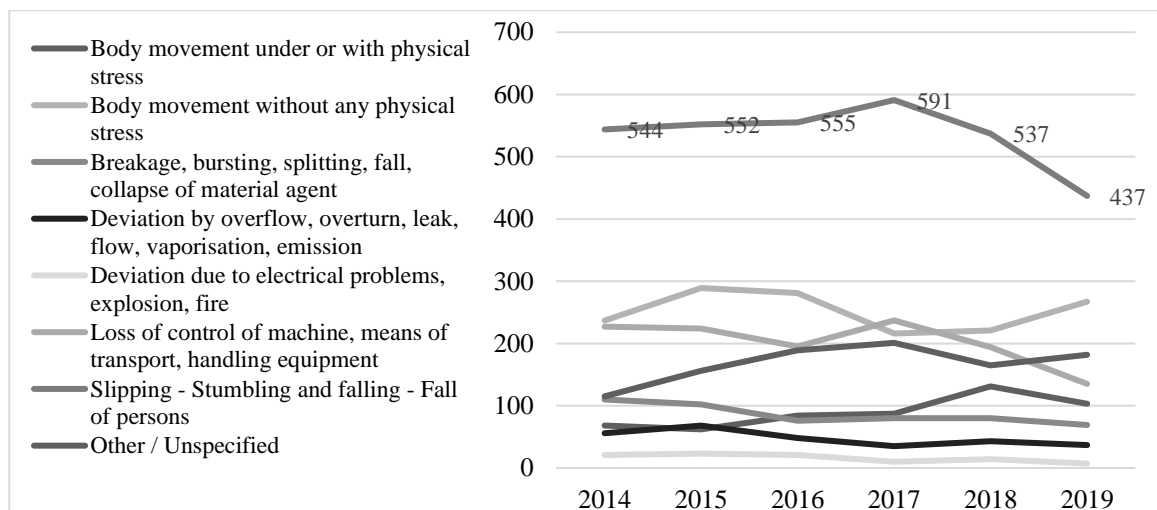


Figure 2. Causes of accidents to persons (Based on reports received from the national accident investigation bodies of the EU), 2014-2019

Source: European Maritime Safety Agency (2020b) [10].

The globalization processes of the last ten years have led to the development of an international system of division of labour. Therefore, shipowners are concentrated in economically developed countries, and seafarers become citizens of Third World countries. For example, large shipping corporations Maersk, MSC, SMA CGM, NYK Line form a single structure, which includes: manager, shipping company, shipping brokers, freight forwarding companies, crewing companies, agency companies, ship supply companies, etc [12]. These corporations independently solve the problems of hiring and selecting qualified specialists all over the world for their vessels. Smaller-scale shipping companies cannot afford such an approach to the formation of highly qualified crews, so they practice a cost approach to crewing.

The practice of human resources management of shipping companies shows a reduction in the shipowners' costs in case of using a cost approach to crewing, while this approach results in reducing the competence, coordination and cohesion of the crews. International law provides for the liability of crewing companies to the shipowner for the quality of work performed, but practice shows that their functions are limited. This is manifested in formal checks of the qualification of human resources, documents and certification of crew specialists.

China COSCO SHIPPING Corporation Limited is an international Shanghai-based shipping company, it is a merged entity of China Ocean Shipping (Group) Company (COSCO) and China Shipping (Group) Company (China Shipping). As of September 30, 2020, the total fleet of COSCO SHIPPING included 1,371 vessels with a capacity of 103.99 million tons. The company is a world leader in the shipping industry. The container fleet has a capacity of 3.16 million TEU, providing third place in the world ranking. The company has a dry bulk fleet of 440 vessels, a tanker fleet of 214 vessels and a total specialized cargo fleet of 145 vessels. A global presence provides global brand awareness. The Company's industrial structure includes logistics, terminals, ship repair, shipbuilding, shipping financing. Internationally, the company has invested in 59 terminals, including container terminals, with an annual capacity of 126.75 million TEU. The mission of China COSCO SHIPPING Corporation Limited involves the globalization of the Chinese economy, ensuring leadership in global delivery, consolidation of resources, the formation of an integrated logistics system, financial services. The company is also developing diversified industrial clusters to provide comprehensive services in the shipping industry, forming a global supply chain. The major provisions of the Company's strategy are ensuring profitability, increasing the scale of the business, countercyclical potential. The company develops six industrial clusters: logistics, finance, shipping, transport services, equipment manufacture, social services clusters, integration of innovative business models. The formation of social services cluster actually confirms the integration of the concept of social responsibility in China COSCO SHIPPING Corporation Limited, and takes into account the intercultural interaction of employees in personnel management to establish effective interaction of employees.

The sustainable development strategy includes the concept of the company's social responsibility and globalization in the long run (Figure 3). Therefore, human resources management is based on these concepts to unify the corporate culture and eliminate barriers between staff in different regions of operation, ensuring equal rights regardless of age, culture, nationality and other socio-demographic characteristics of staff. These concepts form the idea of multiculturalism and fair social dialogue for effective communication.

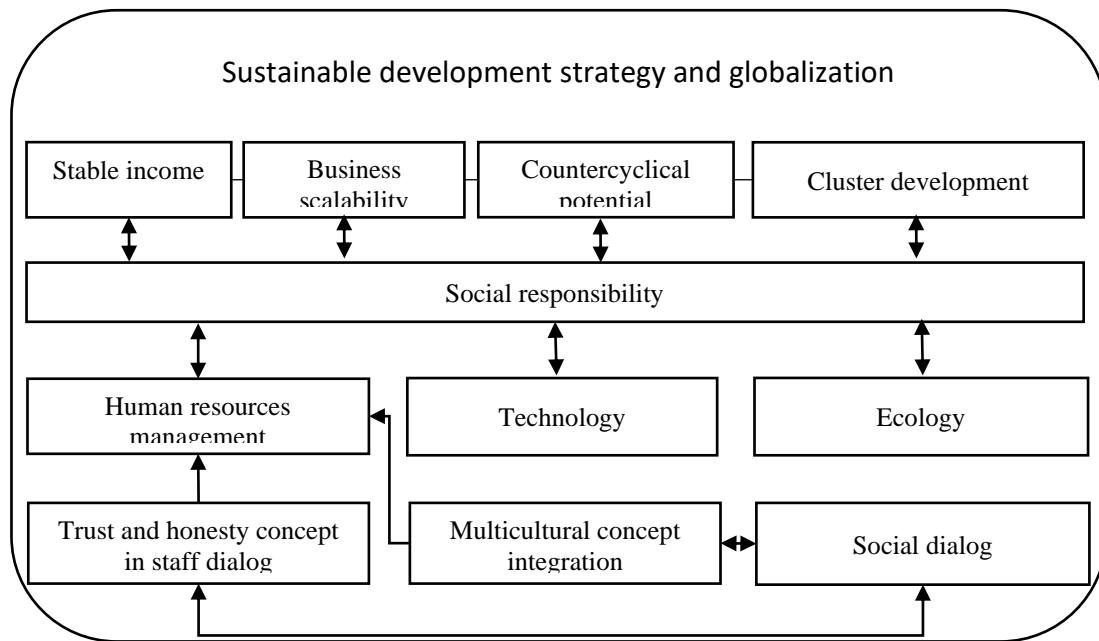


Figure 3. Socially responsible human resources management of an international company

Source: developed by the author.

Honesty and trust are recognized as fundamental principles of interaction with staff, and the basis of the mechanism of dialogue within the company. Mutual responsibilities for personnel management are distributed within the company in such a way as to ensure the sustainable development of human resources management with defined centers of responsibility. There are multi-level and multidirectional communication channels between employees to establish effective communication.

### Company human resources management and integration of concepts of multiculturalism, intercultural interaction of different nationalities

Human resources management of China COSCO Shipping Corporation Limited has gradually transformed since the company foundation in 1980 until the integration of the concept of sustainable development and accession to international agreements in 2014 to ensure social responsibility. International activity and globalization require the company to adhere to the rules of the international legal community in the context of staff development. The evolution of the concept of human resource management is due to such challenges and social problems as the protection of economic and social rights, especially the most vulnerable groups (migrants), the need for training and staff development through different initial competencies of crew members, the need for skills testing. Due to the risks of conflicts between multinational teams, which often lead to financial losses, incidents on ships, personnel management policy provides for all aspects of the interaction of crew members.

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The company is developing a policy of multicultural human resources management, given the growing number of staff of different nationalities (Figure 4), the share of which is growing every year. Management provides for the selection and recruitment of employees, evaluation of productivity and efficiency, the use of incentives and rewards. Recruitment includes expanding the number of recruitment projects of different nationalities on the basis of market selection and taking into account the professionalism of seafarers. Performance appraisal includes a

democratic annual appraisal of employees, encouraging regular institutionalized support for management by officers. The company offers medium and long-term incentives based on the achieved results.



Figure 4. China COSCO Shipping Corporation Limited Employment from Hong Kong, Macao, Taiwan, and other parts of the worlds in 2016-2018

Source: calculated based on China COSCO Shipping Corporation Limited (2020).

To overcome the language barrier, training and testing the quality of foreign languages of employees is used, which determines the talent pool. The company uses innovative thinking and an international vision of talent through international exchange. China COSCO Shipping Corporation Limited creates a favourable working environment: physical and mental to achieve staff productivity, professionalism and maintaining competence. This includes assessing the health of staff and building a database of health status of staff, medical support for seafarers on board, telemedicine and online crew consultation.

China COSCO Shipping Corporation Limited provides personal development of crews through the development of technological platforms, the formation of a humanistic environment, material support. This ensures the implementation of corporate culture development policy and its combination with the individual aspirations of employees to form a positive image of the company as an employer.

### The concept of social responsibility of the shipping company in human resources management

The concept of social responsibility of a shipping company is characterized by a long-term emphasis on the basis of the management system of fulfilment of social obligations to staff. The New Century development strategy initiated in 2000 took into account the interests of stakeholders: customers, staff, shareholders, partners to maximize profits and protect the environment. China COSCO Shipping has established multi-directional and multi-level channels of communication with employees to form an integrated culture regardless of the location of ships. These communication channels are built on a sustainable development strategy based on the principle of mutual trust between stakeholders in the management of social responsibility.

For example, in 2014, China COSCO Shipping joined the world's largest international social responsibility organization, the UN Global Compact. The company has integrated the principles and requirements for the protection of human rights, environment and labour into the sustainable development strategy. Since 2006, the company has been actively implementing a socially oriented human resources management policy. China Shipping is a leader in socially responsible business and a leader in "green development", considering social commitment as the foundation of corporate culture and values.

The company's institutional documents regulating social responsibility are the Guidelines for Ship Ballast Water Management and the Ballast Water Management Plan. These documents provide for the reduction of the impact on marine biodiversity and the development of a standardized system for managing the impact on the environment in accordance with the Ballast Water Convention. Such a system provides intelligent technological taking aboard and discharging ship ballast water to minimize the risks of alien species entering local waters during navigation.

## Discussion

The study proves the impact of external shocks (international regulatory changes and rising labour costs due to the need for additional staff) on the transformation of shipping companies' operating strategies. In response to international legal requirements, shipping companies are forced to clearly regulate compliance procedures, using technology to reduce the negative impact on the environment. The reviewed experience of China Shipping as a world shipping leader proves the integration of the concept of social responsibility into the sustainable development strategy.

Instead, the concept of multiculturalism is more complex due to internal and external problems: international requirements for the protection of personnel rights and welfare of seafarers, the company's internal problems of productivity, profitability through the mechanism of assessing the physical and psychological health of seafarers. The study proves that ship accidents and incidents are caused by the psychophysiological condition of seafarers, which is determined by a number of factors. Such factors include intercultural interaction, values, and language barriers. Sampson (2016) made similar findings, where financial driver occupies the leading position among the drivers of integration of the concept of social responsibility. All measures of shipping companies in one way or another lead to costs through the mechanism of imposing sanctions or through the mechanism of operating costs.

While the concept of social responsibility involves avoiding the risks of paying fines for non-compliance with international requirements, the concept of multiculturalism provides reducing the risk of accidents and incidents due to intercultural differences that lead to psychological destructive conditions of the crew. Thus, the study proves that human resources management in the maritime industry is becoming more popular due to the development of technologies to address the integration of international legal requirements into companies' operations [1], the need to increase the competitiveness of shipping companies through cost reduction, innovation in human resources management [14], ensuring ship safety [15], in particular through the integration of new concepts of human resources management.

The most popular human resources management system of an international shipping company is a platform-based system, which has also been proven in Vučur, Miloslavić&Bošnjak (2016). Platform-oriented human resources management involves digital development and assessment of personnel skills. The platform is an effective management tool given the need for continuous monitoring of the efficiency and productivity of the multinational crew to prevent the risk of incidents. International companies in general effectively manage human resources through digital technologies [23]. Efficiency is confirmed by the growth of the staffing level of different nationalities, as well as employee loyalty [2].

Our research proves that the shipping industry is developing strategic human resources management, which combines human resource functions and management processes. As a result, personnel policy and practice are being transformed through a combination with a sustainable development strategy. Human resources development is one of the elements of strategic sustainable development, which begins at the stage of hiring, selection of crew members for the selection of talents. This provides effective results. "A maritime company can provide specific human resources strategies of continual training programs and regular assessment. A maritime company can increase productivity if there is an adequate human resource planning and integration of human resource strategies with business strategy" [3].

## Conclusion

The study examines the existing practice of integrating international and national regulatory documents in the field of shipping regulation. Legislative pressure of international, national requirements and standards determines the integration of the concept of socially responsible business. Financial sanctions as a consequence of the development of legal policy to regulate the shipping industry force companies to take into account the environmental and social components of doing business. International shipping companies use a supportive approach in implementing the concept of social responsibility. It is determined that the concept of multiculturalism arises due to the need of international companies to find cheap labour in order to optimize operating costs. The negative effects of intercultural human resource management include the additional costs of maintaining the physical and psychological well-being of staff to ensure the required level of professionalism, competence, reducing the risk of incidents, ship accident rate. It is proved that the concepts of multiculturalism and social responsibility in personnel management are aimed at cost optimization, and the side effects of implementation are the formation of a positive image, reducing the impact on the environment, additional incentives for employees.

The concept of multiculturalism, intercultural interaction between different nationalities and the concept of social responsibility are closely linked. This relationship is determined by the financial capabilities and costs of companies for the welfare of seafarers and the protection of the environment from potential accidents and incidents on ships. Optimization of financial costs remains the focus of the implementation of the concept of social responsibility or

intercultural interaction of staff. Optimization is realized through compliance with international standards for environmental protection, reduction of emissions of harmful substances or through the acquisition of environmentally friendly vehicles to improve the quality of service/reduce costs.

The results of the study can be used by international shipping companies to integrate the concepts of sustainable development, social responsibility, multiculturalism in human resources management. These concepts allow preventing the risks of financial losses (imposition of fines and sanctions, incidents due to conflicts between employees of different nationalities). This ideology is especially relevant due to the constant need to reduce and optimize the costs of shipping companies.

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## SOCIAL AND PSYCHOLOGICAL CARE TO OLDER URBAN RESIDENTS DURING THE CORONAVIRUS PANDEMIC

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### Abstract

Article relevance. Initially, awareness of older people's situation during the coronavirus pandemic, as a special social problem in the world, was limited to solving economic problems of the elderly's physical survival; then came the period of development of socio-psychological assistance programs to the elderly. The aim of the study is to identify the features of socio-psychological work with the elderly during the coronavirus pandemic, as well as to develop a technology for crisis intervention in socio-psychological work with the elderly. Research methods: as a research method, the questionnaire method was used, which allows us to find out the most effective features of older people lifestyle during the coronavirus pandemic. Research results: the article defines the importance of socio-psychological technologies of crisis intervention during the pandemic in working with the elderly. The authors identified the features of social and psychological assistance to older urban residents during the coronavirus pandemic. It is shown that the pandemic situation is a crisis period in the life of older people, which often leads to the formation of fears and despair in older people, increasing the existing tension, and developing into a crisis state. It was found that high and medium levels of personal aggressiveness lead to the situation when elderly do not accept help from outside (despite the fact that they need it), and contribute to their getting stuck in a crisis. It is shown that the lack of flexibility and inability to change only increases the difficult situation. It is revealed that prolonged stay of an elderly person in self-isolation can cause depressive states, among which mild situational and masked depression are most pronounced. It is shown that the general psychological state of the elderly, the degree of their psychological comfort affect the attitude to life, the level of life satisfaction, which is in more than a third of the surveyed elderly people identified as low.

**Keywords:** Elderly, Self-Isolation, Coronavirus Pandemic

JEL: I10

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## Introduction

Elderly people are one of the most poorly studied categories of the Russian population, and in the conditions of modern reality, during the coronavirus pandemic, this is a huge omission. Although this is an absolute minus, because it is during the period of self-isolation of a person that the established daily routine, relationships with others, habits, attitudes and internal values change for years.

A person begins to be influenced by other social norms and rules than in the usual mode. All this transforms a person's life into something new, to which you need to find an approach, accept and adapt [13; 1; 22; 19].

Old age is a very difficult and at the same time necessary period for each person. This is, for the most part, a turning point in the already established routine of life for years, where there is a rethinking of one's ideas about life, inner beliefs and values, a view of many things changes, new goals, interests and hobbies appear. Older people become free from work obligations, and most complete their work activities. They devote all the free time to their family, grandchildren and leisure. A person, who has passed and emerged from all age crises successfully, is completely satisfied with his/her life and does not have any negative consequences [2; 9; 3; 16]. It is the study of older people lifestyles, their daily practices and life satisfaction in general that will help to identify gaps in the system of socio-psychological care for the elderly during the coronavirus pandemic and give an impetus to improving the current state [21; 14; 13]. A significant increase in the share of older people and pensioners in the general population raises an acute question for society about the need for social, psychological and professional adaptation of older people to the later period of life [17; 5; 4].

Elderly persons can complete their work; there is more free time, which is advisable to fill with something. However, unfortunately, leisure for this category of the population is not as developed as for young people. Elderly persons can continue their work, and the motives can be a variety of factors: from material necessity to internal satisfaction and creative self-development [15; 20; 10].

There are changes in the needs, desires, characteristics and capabilities of a person. All this activates a complex mechanism-adaptation to a new self [7; 8; 18]. It is very important to understand how a person lives in a situation of self-isolation, how his life is arranged, what he/she fills his/her free time with, what they are not ready to put up with and what they lack for a full life in the conditions of modern reality. The results of this study will help to show the real picture of older people's life, as well as the strengths and weaknesses that modern society should pay attention to [23; 6; 12].

## Materials and Methods

An experimental study on the development of social and psychological care's technology, crisis intervention, in the period of self-isolation, with the elderly was conducted in several stages:

- Diagnosis of individual characteristics of the elderly;
- Analysis of the obtained data on the individual characteristics of older people;
- designing a model of social and psychological care to the elderly during the coronavirus pandemic, as a technology for working with the elderly;
- Development of recommendations for the use of the developed technologies.

A study of older people's perceptions about the peculiarities of the perception of self-isolation was conducted. The method consisted of three questions composed by the method of unfinished sentences and allowed to identify the features of individual perception.

The sample consisted of 42 people, women and men aged 55 to 75 years. The age of the persons included in the sample was determined by the retirement age for men and women in this country.

In the pilot study, some respondents (23%) indicated apathy, indifference to everything, depression and fatigue. At the next stage of the study, the diagnosis of individual characteristics of older people was carried out to confirm the ideas of older people about the peculiarities of the manifestation of self-isolation's crisis in old age. Diagnosis was carried out by normative psychological methods, and upon completion, the analysis of the obtained data was carried out.

## Research Questions

Whom is the informant currently living with?

Does the informant have a family? What family members does it consist of?

How does the informant's relationship with his/her family members develop during self-isolation?

Would the informant want to change something in their relationship with close relatives?

Does the informant have close friends?

How does the informant's relationship with friends develop during the period of self-isolation?

How do informants prefer to spend time with friends?

What impact does religion have on the informant during the coronavirus pandemic?

Does the informant visit cathedrals, mosques, or churches?

How are the weekdays of the informant?

How does an older person see their perfect day?

What does an elderly person prefer to do in their free time?

How does an elderly person characterize their health status in general?

Does the elderly person attend any medical and preventive procedures?

Have the living conditions of an elderly person changed during the coronavirus pandemic? In what way?

What does an elderly person understand by self-education?

Is the informant engaged in self-education? How is this implemented?

How much time a day is an informant willing to spend on self-education?

## Results

As part of the first set of questions, it was important to find out whom the informant lives with, whether the informant has a family, and how the informants' relationships with their family members develop. Most of the older people surveyed (82%) live either with their husbands, wives, or their children, and in their own opinion, are not single people. Most likely, under the statement lonely people, informants understand a person who lives alone, does not receive full attention from the people around him/her, does not have close contacts with any of the relatives and feels his/her own uselessness. All elderly people (100%) note a trusting relationship with their family members and would not want to change something radically. At the same time, almost half of the elderly (54%) do not rest together with their close relatives for various reasons. Most likely, this is due to the deteriorating state of health and lack of free time in the younger generation. Perhaps older people do not have such warm relations with relatives, but none of the respondents reported this. One of the most voluminous parts in terms of responses is the part associated with changes in the living conditions of informants after the announcement of self-isolation. Of course, the absolute majority of older people note the deterioration of their financial situation, and the lack of interest, unwillingness of the state to help people of older working age in the material issue. As the informants themselves note, there is only enough money for necessities, for paying for utilities and buying clothes, some of the money is set aside for unforeseen needs. The study showed that one-third of the subjects (34%) have a high level of rigidity, i.e. older people lack flexibility (up to complete inability) and plasticity in conditions that objectively require their adjustment. It manifests itself in the immutability of behavior, beliefs, and views, even if they do not correspond to reality. The average level of rigidity is found in 53 % of Elderly people and in 13% of cases at a low level, which suggests easy switching of respondents. The study allows us to conclude that of the four diagnosed conditions, the most pronounced is rigidity and aggressiveness (24% - at a high level). More than half of the respondents (56%) are frustrated in the situation of coronavirus, experience negative experiences, are disappointed, irritated, every fifth elderly person (20%) is deeply frustrated. 40 % of subjects experience an average level of anxiety, and 13% experience a premonition of impending or apparent danger (high level).

Anxiety and frustration lead to the formation of fears and despair in older people during the coronavirus pandemic, which can increase the existing tension and develop into a pathological crisis state. High and moderate levels of aggressiveness can lead to the lack of older people's accepting help from outside (despite the fact that they need it), and, consequently, to their being stuck in a crisis. The lack of flexibility and inability to change will only increase the difficulty.

Therefore, social and psychological work with these qualities of older people is necessary; it should prevent work to overcome specific problems and difficulties in the period of self-isolation. In addition, at the same time it should contribute to the successful resolution of the crisis.

The next set of research questions concerns the communicative activity of informants. As part of this unit, it was important to find out whether the informants had close friends, girlfriends, comrades, how often they met and how they spent time together. Most of the informants noted that their social circle had narrowed over the years. The main reasons were the inability to keep in touch with friends (11%), the move of the informant or his/her friends to another city (38%), as well as the end of work (73%), which affected rare meetings with colleagues. Most women (67%) had several close friends, while men noted either one close friend (13%) or several companions (45%). Most likely, this is due to a certain psychological secrecy and isolation of men. Men are more selective in matters of friendship, and quite clearly draw the line between friend and comrade. Women spend time at home or on the street talking, while men call on the phone or meet in the garage. The most relevant topics for communication are family relations, discussion on the topic of state and world news and problems, discussion of TV series and TV shows, as well as news related to mutual friends and colleagues. However, during the period of self-isolation, they also lose these rare meetings.

Most of older people, in their own opinion, do not lead an active lifestyle. In the concept of an active lifestyle, informants include, first, proper nutrition and regular physical activity, some associated this concept with the possibility of a variety of leisure activities. In their free time, informants prefer to watch TV (88%), read books (13%) and magazines (6%), and spend time on the Internet (23%).

The absolute majority of informants note a deterioration in their health, while many do not visit hospitals, citing the lack of qualified medical staff and fear of catching an infection. Minority of informants (13%) visit private hospitals, but, as a rule, this is due to the inability to carry out certain types of procedures in public institutions. In addition, a minority of informants attend any medical and preventive procedures (5%). The most relevant medical procedures are leech treatment, therapeutic massages, acupuncture. Only a third of informants (34%) visits medical sanatoriums, others note the high material side of this issue. Analysis of the results shows that only half of the subjects have a level of psychological state without depression (53%), the remaining 47% of older people have mild situational (42%) and masked depression (5%). That is, 42% of older people experience situational depression, usually caused by stressful circumstances associated with a situation of self-isolation. This is the psychological reaction of an elderly person to actual stress. A stressful factor can be the danger associated with the coronavirus, a breakup of relationships, problems in the family, disappointed expectations, and so on. Mild depression passes as the stress factor is overcome. However, if the stressful situation is prolonged or lasts indefinitely, it makes sense to seek professional help so that this condition does not develop into a masked depression. Analysis of the data of the conducted methodology shows that a low level of the life satisfaction index is observed in more than a third of the surveyed elderly people (34%), the average level of attitudes of older people to life is revealed in 51% of older people, 15% of respondents consider their standard of life to be high.

The study reflects the fact that between 23% and 35% of older people are unable to express the content of their interest in life. Older people believe that life has brought them more disappointments than to most people they know (35%), do not agree with this statement 30% of subjects. From 25 to 35% of older people do not yet know the answer to these questions. According to the study, 30% of seniors believe that they do not look better than most other people of their age do, but 40% of subjects do not agree with them. 27% of respondents say that too often, compared to other people, they are in a depressed mood, 20% are sure that no matter what they say, and with age, most people get worse, not better. From 53% to 30% of the subjects still do not know the answer to the questions posed. The next group of questions provides an answer to the state of the general mood background of older people. Half of the subjects cannot estimate the period of time they live now (54%), 23% believe that now is the darkest period in their lives, and only 23% of respondents do not agree with them. Their life could be happier than now it is - believed by 30% of the elderly, 23% - do not agree, 53% - do not know what to answer. And if in gloom nature of present period (54%) and unhappy life possibilities (46%) are unable to understand almost half of interviewed informants, and to declare him/herself a happy man or a woman as in the days of youth (44%) or experiencing now their best years of life (33%) still cannot more than one third of the subjects. A differentiated assessment of the needs, motives, attitudes, value orientations of older people allowed us to establish that from 30 to 40% of respondents do not know the answer to questions related to these vital landmarks, that is, they need to create a psychological foundation for accepting their own experience. In addition, the final unit is self-education. This includes answers to questions about what informants understand by self-education, whether they are engaged in their own self-education and how they implement it, as well as how much time per day informants are willing to devote to their self-education. By self-education, informants understand the development of certain abilities and getting an education at home. About half of the informants (54%) are engaged in their own self-education and implementing it through the global Internet. In addition, many people read specialized literature, visit exhibitions and watch TV shows. There are several main areas of self-education of older people: women are passionate about cooking, gardening, art, are interested in foreign languages, and men prefer mechanical engineering, politics and robotics. Most informants are willing to spend 40 minutes to 2 hours a day on their self-education. In general, this is quite a significant part of the time and this indicates the interest and desire of informants to engage in their own development.

## Discussion

In modern society, from time to time, there is an increasing need to study different strata of society. This is expressed, first, in the study of their social and economic life, in the interpretation of their value orientations and beliefs, the study of the stylistic features of various societies and their members. Therefore, one can conclude that the majority of informants belong to the constructive type of older people. These are calm, happy, cheerful and sociable people who remain optimistic, are still active, strive to help others, in particular, they spend huge efforts to achieve harmony and complete mutual understanding in the family. Of course, there are some problems that have arisen during the coronavirus pandemic, primarily related to health and financial situation, but otherwise the results of the study indicate that older people are passionate about leisure, they have a desire to develop and improve themselves, but the main thing is that they do not withdraw into themselves, remain cheerful and friendly people.

Most of the interviewed informants are not alone; they have a family consisting of: husband, wife, children, and grandchildren. Most of the informants have a warm relationship with close relatives, and none of the informants wanted to change anything in the already established relationship.

Many informants have close friends. It is worth noting that female informants talked about several close friends, while men singled out only one close friend. The topics of conversations with friends are very diverse: from the events of the day to the discussion of the political situation in the country. Informants are quite sociable and friendly, and communicate with people not only their own age, but also with younger generations. When asked about religion, many informants answered reluctantly, in monosyllables. All informants were divided into two groups, conventionally called believers and non-believers. It is worth noting that the number of the first group at times prevails over the second.

Most informants have certain hobbies; engage in their leisure and self-development. When asked what the informant does in his/her spare time, the most popular answers were watching TV, reading books, watching videos on the vast global network and communicating in social networks. Many people have health problems, but do not attend medical institutions. This is primarily due to the provision of low-quality services by state institutions, and their funds do not allow visiting private clinics.

The vast majority of informants are dissatisfied with their financial situation, and would like to receive support from the state. Several informants do not hide the fact that adult children now provide them with a decent life.

## Conclusion

The crisis of old age requires the involvement of operational technologies to provide social and psychological assistance to the elderly. The relevance of the considered problem is confirmed by the sharpness of the contradiction between the existing situation associated with the coronavirus pandemic, crisis states in the elderly due to age, and the lack of technologically developed models of professional intervention of a specialist in order to help an elderly client in crisis periods of his/her life.

Fear makes an elderly person either exercise strict control over the situations of their life, narrowing their meaning of life, or completely deny it. Despite the existence of various types of crises (neurotic, traumatic, etc.), in the practice of socio-psychological work, a specialist most often meets with age-related crises, they are usually called normative; crises of old age can be divided into situational (diseases, dangers coming from outside, loss of loved ones, changes in living conditions, etc.) and biographical (crisis of un-realization, crisis of emptiness, crisis of hopelessness).

The pandemic situation is a crisis period in the lives of older people, which often leads to the formation of fears and despair among older people, increasing the existing tension, and developing into a state of crisis. High and medium levels of personal aggressiveness lead to the situation when older people do not accept help from outside (despite the fact that they need it), and contribute to their being stuck in a crisis. The lack of flexibility and inability to change only increases the difficulty. Prolonged stay of an elderly person in self-isolation can cause depressive states, among which the most pronounced are mild situational and masked depression. The general psychological state of the elderly, the degree of their psychological comfort affect the attitude to life, the level of life satisfaction, which is in more than a third of the surveyed elderly people identified as low.

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