«ЖАҺАНДЫҚ ӨЗГЕРІСТЕР ЖАҒДАЙЫНДАҒЫ ТҰРАҚТЫ ЭКОНОМИКАЛЫҚ ДАМУ ПАРАДИГМАСЫ: СЫН-ҚАТЕРЛЕР, САЛДАР, МҮМКІНДІКТЕР»

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ӘЛ-ФАРАБИ АТЫНДАҒЫ ҚАЗАҚ ҰЛТТЫҚ УНИВЕРСИТЕТІ

МИНИСТЕРСТВО НАУКИ И ВЫСШЕГО ОБРАЗОВАНИЯ
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Strategic investment management of financial institutions

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Abstract

This article discusses data on the strategic investment management of financial institutions. The stages of the investment movement and aspects of the economic value of investments are analyzed. The issues of the application are disclosed of the main strategies used by investors engaged in investment activities in the financial sector, depending on the investment objectives, type of management, the nature of the economic situation and many other factors of various strategies, as well as their description. The role of investment activity as a necessary condition for the circulation of enterprise funds, the main stages of the movement of investments are determined. The importance of developing an investment strategy of an enterprise in the era of the development of modern digital technologies, and the effectiveness of further use is shown. The advantages of the strategic management system widely used abroad have been studied and determined. In addition, information is provided on the main factors of the investment attractiveness of the enterprise. The system of long-term goals of investment activity and ways of their implementation are explained. The stages of the development of a general strategy for the economic development of the enterprise, which are the initial condition for the formation of an investment strategy are also presented. The main strategies used by investors conducting investment activities in the financial sector are disclosed. Among the qualitative characteristics of performance, the features of investment-oriented strategies are highlighted. Types of investment strategies also focus on data on the possibility that an investor may differ from each other depending on what type of investment he is engaged in and, most importantly, what goals he pursues, as well as on portfolio strategies.

Keywords: investment, strategy, enterprise, management, capital, stocks, investor.

JEL codes: E22, G11

1 Introduction

The investment policies and strategies of any financial institution are the basis for regulating the investment process and ensuring the social and economic sustainable development of the entire financial institution. Today, the correct implementation of investment strategies by financial institutions, whose main purpose is to realise financial relations in society, increases the efficiency of organisations of various forms of ownership and contributes to production. Сонымен қатар институт бірлігіне, ұйымшылдығына, мәртебесіне әсер етеді. At the same time, it affects the unity, organisation and status of the institution. The investment strategy of a financial institution should focus on long-term goals and should be implemented in the current business process by selecting ongoing investment projects and programmes. The formation of an investment plan is a complex and creative process based on the forecasting of certain investment market conditions and conditions in general and in individual segments. This strategy always shapes the overall economic development strategy within its framework. [1]

The flow of investment passes through two main stages. The first stage, “investment resources-investment”, focuses on the economic activity associated with the investment. The feasibility of this period is determined by the return on investment resources.

The second stage of "financing - investment output" involves recovering the costs incurred as a result of using the investment and generating income. It describes the relationship and interdependence of the two necessary elements of any economic activity: costs and returns. Hence, it is possible to define the meaning of economic and investment activity as the unit of the processes of investing resources and generating income in the future.

When investing in a specific sector of the economy, the organisation of production is as follows: the flow of investment is as follows: the turnover of production assets: a finished product is created, includes an increase in the value of the capital when sold, and its income is generated.

Investment activities are a prerequisite for the turnover of a company's funds. Production activities, in turn, create the preconditions for new investments. From this point of view, any kind of entrepreneurial activity includes independent and autonomous as well as isolated processes in investment activities, as well as the most important interrelated activities as constituent parts of a single economic process.

The rapid development of the domestic stock market requires a creative search for and critical analysis of foreign experience. The experience of developed countries shows that a strategic management system is an effective tool for adapting to changes in the external environment. This is because

digital finance is fundamentally changing the traditional order of common financial services. They contribute significantly to the emergence of financial innovation and related services for consumers. Digital finance is widely used in online payments and transfers, currency exchange, and mass payment services. These technologies are actively used in consumer and business lending and crowdfunding.

Capital management, financial planning, investments, equity trading and long-term savings services are being promoted. In addition, digital finance promotes investment in high-tech sectors of the national economy, which supports widespread economic growth. The effective and secure development of digital finance requires the coordinated interaction of all business entities using financial technology. In the digital age, the first task is to develop an enterprise investment strategy, finding investment resources in order to use them effectively. However, in a complex economic environment during the digital transformation, the banking sector is undergoing significant changes and obtaining foreign investment is complicated by various factors, a company's investment strategy must consider many factors and be prepared for rapid change in order to carry out successful economic activities. [2]

2 Literature review

The report analyses and summarises the work of economists in the field of investment strategy management in financial institutions.

The range of types and methods of creating and managing investment strategies is very large. O.A. Alekhina's work on investment activity of enterprises shows complex creative processes of forming an investment strategy plan. The works of L.I. Yuznovich investigate finance, money circulation and credit, their relation to investment. Russian economists M. Y. Geraskin and M. L. Dorofeev's research includes investment planning models, matrix methods of corporate finance management. In addition, O.V. Borisova and L.V. Bryantseva's works define the information on enterprise investment and innovation management and innovation management. V. D. Filatova on investment strategies of enterprises and T. V. Pogodina's works on investment management define the information.

3 Methodology

The methods of systematic, factor and dynamic analysis, scientific abstractions and systemic approaches were used. A brief analysis of the works of authors studying the problem has been made.

System analysis is a scientific method of cognition that expresses a sequence of actions to establish structural relationships between variables or stable elements of the system under study.

Factor analysis is a comprehensive and systematic study and methodology for measuring the impact of factors on the value of the resulting indicator. Here the investment strategy of an enterprise involves the creation of prerequisites for the formation of investment attractiveness associated with the implementation of a number of measures, the main factors of investment attractiveness of the enterprise are considered.

Dynamic analysis is a method of economic analysis that shows how one equilibrium situation is replaced by another.

The method of scientific abstraction is a method of economic theory that allows us to exclude individual, unimportant relationships between actors in the economy and to focus on several actors.

The systems approach in economic science is a methodological direction of scientific research, which consists in an integrated study of both a unified economy from the perspective of system analysis and synthesis. The most effective and well-known methods of strategic management system, which are widely spread abroad, are considered here.

4 Results and discussion

The economic value of an investment consists of the following aspects.

Investment is the source of the impact of economic activity, which can be economic and non-economic (social, environmental, etc.).

Investment is an active form of attracting accumulated capital into the economic process. The economic boundaries of capital formation are determined on the one hand by the marginal product of capital, and on the other hand by the rate of depreciation of capital.

Investment can be seen as a form of transformation of part of the accumulated capital into alternative types of assets of the enterprise. From the most universal form of money, capital becomes a material form that acts as a "factor of production".

Investments are the object of market relations, forming a special kind of market - the "investment market", characterised by the demand, supply and price of investment resources, as well as a set of defined subjects of market relations.

Investments are a business entity whose criteria are time-related economic effects, the risk of not being affected by a liquidity constraint, i.e. the ability to make an investment at a real market value.

From an economic and legal point of view, investments are property objects - ownership can be separated from the right of disposal, which leads to the "agency problem" of a mismatch of interests between investors (owners) and managers.

Investment is the investment of resources in tangible (fixed assets, intangible assets) or financial (shares and other securities) assets in order to generate income. Investment activities refer to the set of activities for making and managing investments.

Classification of investments. Several classifications are used in economic theory and economic practice to describe different types of investments.

A distinction is made between real investments and financial investments. Real investments are investments of financial resources in real assets (fixed assets, intangible assets) for the purpose of obtaining income. For financial investments, the objects of investment are financial assets (shares, bonds, options, etc.).

The investment process is divided into direct, portfolio and indirect investments. Direct investments include loans, credits, bonds and guaranteed obligations. Portfolio investments are made in the form of participation in the share capital of the object of investment - purchase of shares, making contributions. Indirect investment describes capital investments made through financial intermediaries.

According to the direction of increase, investments are divided into total, renewed and net. Total investment characterises the total amount of capital invested in the production of long-term assets. Renovation investment, equal to the amount of depreciation, characterises the amount of capital invested in the simple increase in depreciable assets. Net investment characterises the amount of capital invested in the expanded production of long-lived assets.

Investor-related investments are divided into inward and outward investments. Domestic investments characterise the investment of capital in the assets of the investing enterprise. Foreign investment is the investment of capital in real assets of other enterprises or financial investment instruments made by other economic entities.

Short-term investments are subdivided according to their maturity - usually in the form of financial investments for up to one year; long-term investments - investments made to increase long-term assets for more than one year.

By combination of implementation, investments are divided into stand-alone, interdependent and mutually exclusive. Stand-alone investments are characterised by investments of capital in objects of investment that can be made separately in the investment portfolio of an enterprise. Interdependent investments characterize capital investments in such items of investment, the sequence in which they are made or subsequently used depends on, and can only be made in conjunction with, other items of investment. Interdependent

investments tend to be similar in their objectives, the nature of the technology, the range of products and other major parameters, and require alternative choices.

Investments are divided into risk-free and speculative investments according to their level of investment risk. Risk-free investments describe the investment of capital in investment objects with no real risk of capital loss or expected return. Speculative investments are characterised by investing capital in the riskiest objects, where the highest level of income is expected.

Investments are divided into highly liquid and liquid investments. Highly liquid investments are those that can be quickly converted into cash within a month without loss of market value. Illiquid investments can only be made within the entire property complex.

Private investment, public investment and mixed investment are divided according to the form of ownership of the capital invested.

A distinction is made between initial investment, reinvestment and divestment according to the nature of the use of the capital. Initial investment describes the use of newly created capital for investment purposes. Reinvestment refers to the reuse of capital for investment purposes by releasing it during the implementation of previously selected investment projects. Disposal refers to the process of withdrawing previously invested capital from the investment process.

According to the regional sources of capital attraction, investments are divided into domestic (domestic capital investments of residents) and foreign (capital investments of residents).

Regionally, a distinction is made between domestic and international investments.

Let's talk about shaping an investment strategy.

An investment strategy is understood to be a system of long-term investment objectives and how to achieve them. There are the following types of investment strategies.

Investment impact-oriented strategies can focus on current investment income, long-term capital gains and non-economic investment impacts.

Investment risk strategies are characterised by investor types: the risk-averse investor avoids making risky investments, even though he or she fairly compensates for the increased level of risk with an additional level of investment income; for the risk-neutral investor is acceptable if the investment risk is offset by an additional level of investment income; the risk-averse investor is risk-averse when the additional level of investment income is not sufficiently offset.

The type of investment behaviour is divided into: conservative strategy - investees are selected according to the criterion of reducing investment

risks; medium strategy - investees provide average market levels of return and risk; aggressive strategy - investees meet the criterion of maximising current investment income.

The starting point for shaping the investment strategy is the overall economic development strategy of the company. The related investment strategy is subordinate to it and must be aligned in terms of objectives and stages of implementation. The following stages of strategy development are distinguished.

Stage 1. Determine the implementation period of the enterprise strategy based on projected economic and investment market conditions.

Stage 2. Selection of strategic goals for investment activities based on the system of goals of the economic development strategy. These goals can be presented in the form of capital increase, increase in the level of return on investment and provision of the amount of income, changes in the proportions of forms of real and financial investments, changes in sectoral and regional orientation of investments. At the same time, the choice of strategic goals of investment activity should be linked to the stages of the life cycle and the goals of economic activity.

3 stages. Developing effective ways of carrying out investment activities. First, develop a strategic direction in the form of real or financial investments; second, develop a strategy for generating investment resources.

4 stages. Refine the investment strategy by implementation phase. It is intended to establish a sequence and timeline for achieving individual goals and strategic objectives. [3]

The advantage of the strategic management system, which has become widespread abroad, is that it allows to formulate global development goals for companies, to shape the position of top and middle managers, to quickly adapt to changes in the market environment and thereby increase the competitiveness of the organisation. The process of internal strategic management is cyclical, iterative and includes the following stages:

- a systematic analysis of the prospects, threats and opportunities for the organisation;
- develop future scenarios and analyse the impact of external factors, taking into account the likelihood of certain situations occurring;
- definition of the main objectives, comparison of objectives with future scenarios;
- selection of tasks to be addressed by strategic management;
- developing alternative strategies to achieve the objectives, selecting model strategies, planning the necessary resources;

- developing strategic programmes that implement general and individual strategies;
- implementation of strategic plans and development of a management system.

Strategy usually refers to the most general set of rules defining long-term action to ensure that the organisation's mission is achieved. In addition, the global purpose, which defines the reason for the organisation's existence, acts as the mission. The most general purpose of investing in corporate equity may be the following:

- preservation or redistribution of assets through the acquisition of controlling interests;
- providing access to rare products (services), property and non-property rights;
- participate in the management of the company by buying large or blocking stakes;
- protecting investments from inflation;
- preservation and growth of capital;
- receive a regular current income.

Thus, the type of investor needs to be defined when formulating the mission. In general, the first three of the global objectives mentioned above define the strategic type of investor.

The development of the company's investment strategy involves the following activities:

- setting investment objectives;
- prioritise areas and modalities for economic activities;
- optimising the structure of the company's investment resources for their allocation;
- development of an investment policy for the most important areas of investment activity;
- supporting relations with foreign investment environments.

The investment strategy of a company is important for a business entity and should be created with the mission of the company in mind, and is part of the strategy, coordinated with other functional strategies of the company. The investment strategy should facilitate management's responsiveness to changes in the external environment, to address their negative consequences through new investment opportunities, and to manoeuvre resources swiftly.

Among the sources of investment are the following:

- budget financing;
- personal savings of the company;

- private investment;
- bank loans;
- foreign investment.

When developing an enterprise's investment strategy, the first task is to find investment resources in order to use them effectively. However, in a difficult economic situation in which the economy is in a difficult position, the banking sector is undergoing significant changes, and obtaining foreign investment is complicated by political factors, the investment strategy of the enterprise must take into account many factors and be prepared to make rapid changes in order to carry out successful economic activities.

The investment strategy of an enterprise involves the creation of prerequisites for the formation of investment attractiveness associated with the implementation of a number of measures. The main factors of investment attractiveness of an enterprise are presented in figure 1. [4]

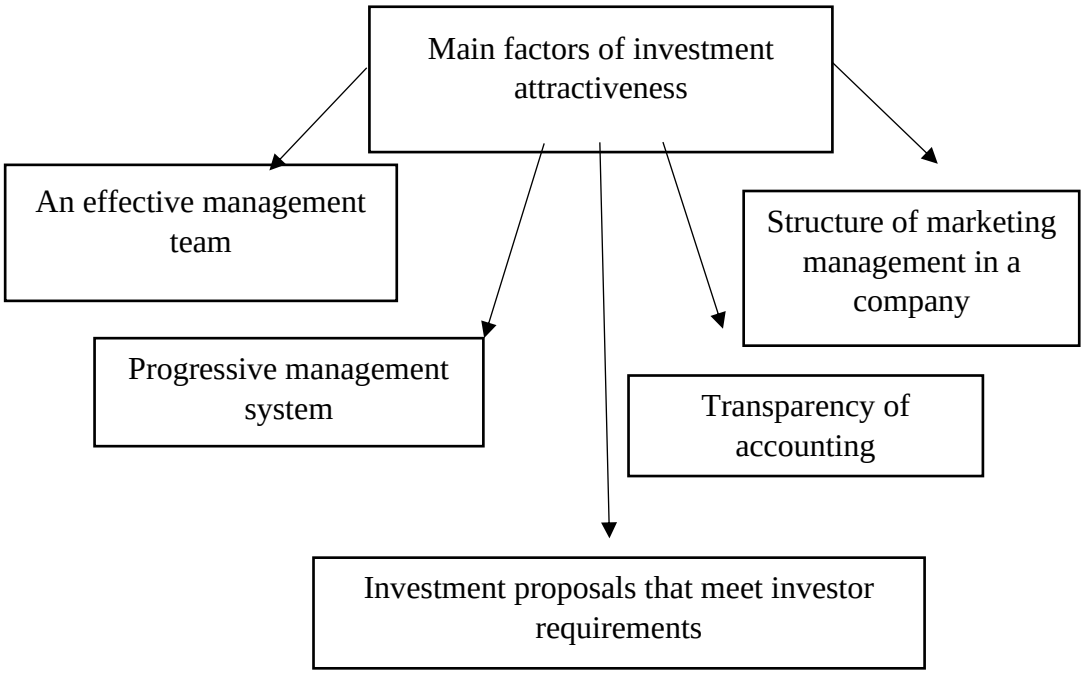

Figure - 1. Main factors of investment attractiveness of an enterprise

Based on the financial strategy formulated as an enterprise investment strategy, it is recommended to understand the systemic set of long-term investment objectives of an enterprise that determine investment decisions.

An enterprise's investment strategy belongs to the category of strategies derived from their financial block. It is at the forefront of the interaction between the strategic and tactical levels of management.

The types of investment strategies of a company are determined by the relationship between the strategic objectives of the investment activities formed in the planning process and the chosen corporate-wide strategy. Investment strategies can be classified according to their period of formation, but in fact, when the state of the economy cannot be called stable, it is better to talk about a period of 3 years or less than 5 years. Among the qualitative performance characteristics, investment-oriented strategies stand out:

1. Consistency and balance of investment objectives.
2. Compatibility and synchronisation with investment policy.
3. Consistent adherence to the corporate development strategy.
4. Compliance with the investment process in the external environment.
5. Communicating the results of financial strategic analysis and planning.
6. Compliance with the established normative values of investment risk.
7. Compatibility of production, sales, financial and social results.

Types of investment strategies can differ from one another, depending on what type of investment an investor is engaged in and, most importantly, what goals he or she is pursuing.

The main strategies used by investors with financial investment activities:

- an aggressive strategy - always aiming to maximise profits in the shortest possible time;
- a conservative strategy does not aim at rapid enrichment, on the contrary, its main objective is to keep the amount of assets at the current level (preservation) ;
- a normal strategy aims to preserve the investor's investment capital and normal growth, all other things being equal. [5]

Many different strategies can be distinguished depending on the investment objectives, the type of management, the nature of the economic situation and many other factors. For example, for a strategic investor whose main mission is to expand its sphere of influence and participate in the management of an enterprise, it is possible to distinguish between strategies of effective ownership and speculative merger.

An effective owner strategy. If this strategy is used, the investor's mission is not only to provide access to certain products and control financial flows, but also to improve the scientific, technical and sales potential and the financial recovery of the issuing company. The main income received by the

investor is long-term and is generated by the business operations of the company. Accordingly, the implementation of this strategy requires significant resources, not only for the purchase of a controlling stake, but also for the development of the issuer. At later stages, the beneficial owner may "advertise" the shares of the controlled company, including in international markets. Finally, when the company becomes very profitable and its shares have risen significantly in value, the investor using this strategy can make a profit by selling his share. Abroad, such a strategy is used by venture capital funds that finance the development of innovative businesses.

The prerequisite for this strategy is not only the availability of significant financial resources, but also experience, connections, and knowledge of the production technology, markets and other features of the controlled enterprise.

A speculative merger or acquisition strategy. The main mission of this strategy is to acquire a controlling stake in order to gain access to scarce products (services), financial resources or to acquire profitable real estate, other property and non-property rights.

Applying this strategy to large companies allows significant financial flows to be channeled to their subsidiary brokerage firms, offshore companies and banks. Investors using this strategy can make a profit by selling a stake to the ultimate investor or by managing the company's cash flows. The purpose of applying this strategy to small businesses may be to buy profitable land in prestigious areas to use for offices, warehouses and new buildings.

Thus, the main feature of this strategy is not business development, but access to property and non-property rights. As a prerequisite for the use of the strategy under consideration, the investor's affiliation with a financial and industrial group, banking or commercial brokerage structures with the necessary resources to acquire a controlling interest can be considered. This strategy can usually be used at the initial stage of privatisation, when the struggle for the redistribution of property in the enterprise begins.

When investing in a portfolio, the choice of strategy is often determined by the type of management. There are usually 2 types of management: *passive* and *active*. Passive management is typical for conservative and moderately aggressive investors.

The main objectives of passive management are to protect investments from inflation and to generate guaranteed returns with minimal risk and low management costs. This type of management involves building a well-diversified portfolio of securities that can calculate returns, risk and liquidity with a high degree of accuracy. Passive management is based on the fact that the portfolio configuration is not reviewed over a long period of time. This

allows the important advantage of passive management to be realised - low management costs.

Active management involves carefully monitoring the market, rapidly acquiring financial instruments that meet the investment objectives, and rapidly changing the structure of the portfolio. The main feature of active management is the investor's desire to outperform the market and obtain higher returns than the market average.

This type of management requires significant costs related to information and analytical preparation of decisions, purchase or development of own software and hardware and methodological support. Significant costs inherent in the active management type include the provision of trading activities and access to stock exchange and OTC trading systems, transaction costs, creation of a share purchase network, etc. This type of management can only be chosen by participants who have their own capital, highly professional staff, and significant experience in managing their own securities portfolio and trust management of client portfolios.

Let's look at a few examples of portfolio strategies. The most common passive management strategy for investing in corporate stocks is the *"buy-and-hold"* strategy. Keep in mind that the effectiveness of this strategy depends largely on the level of undervaluation of the stock and the time period chosen. In a bear market, any other strategy will obviously beat the buy-and-hold strategy. The greatest safety and profitability is achieved over long investment horizons when using a buy-and-hold strategy.

Another type of passive management strategy is the *index fund strategy*. It is based on the fact that the portfolio structure should reflect the movement of the chosen stock index, which characterises the state of the entire securities market (or its important segments). The types of securities and their proportions are determined in the same way as when calculating the index. An investor's main task is to update the market structure of his portfolio with periodic adjustments from six months to a year. It is managed according to the deviation of the portfolio structure from that of the index.

With this strategy, real returns are usually guaranteed when the investment term is at least one year. The main return is generated by the appreciation of the lowest-priced stock.

In our view, active portfolio investment strategies are promising. These strategies can be differentiated according to various classification criteria. The classification allows us to identify the most comprehensive set of strategies and thereby expands the range of activities of an organisation in the dynamic stock market.

The peculiarity of investor activity is that stock market participants can access and select different segments of the stock market: stock exchanges,

retail market (purchase of shares from the public), large wholesale market (e.g. purchase of shares in the process of privatisation). Other sectors of the over-the-counter market. Depending on the focus on a particular market segment, the following types of strategies can be distinguished: *auction, speculative competitor, arbitrage, "hoovering".*

Auction strategies are used when buying at the time of initial sale in cheque, cash and bond auctions held during the share privatisation process. These types of strategies are determined by the conditions of the auction. In particular, the strategies in question were used in the early stages of privatisation. With the right investment targets, shares bought at auctions generated returns through annual price increases of hundreds or thousands of per cent.

The risk inherent in this strategy is that the auction price may be too high because of the demand for the most "tasty" pieces of state property. Another risk is that an investor wants to hedge against a price increase and may not find a price, so he will not be able to buy the shares and his investment will be frozen for a month and a half or two months. If one of the bidders buys a controlling stake in the auction, the investor's expectations may not be realised because of the share price increase resulting from the struggle for control of the company. In the event of a lucky break, one of the companies representing the speculative bidder takes first place and withdraws its bid, while the second-placed bidder is declared the winner. This allows the last investor who did not 'find' the price to make a profit by reselling the shares. [6]

The speculative bidder strategy is often used in investment tenders and closed cash auctions in the privatisation process. The interests of this investor are represented by several firms that try to quote such prices in bids in order to be one of the two winners. On the one hand, this helps to insure the bid in case of improper execution or non-participation of other investors. On the other hand, if one investor is represented by several affiliated firms, there is a high probability of "predicting" the price. One of the prerequisites for the success of this strategy in investment tenders is close contact with the big banks and the ability to establish contact with the sales promoters and the company administration. The main risks of this strategy are related to the fact that in case the bid is rejected (signing of a protocol, conclusion of a contract) the deposit is not returned, so if the parties fail to reach an agreement, the speculator will suffer a loss.

Arbitrage strategy was actively used both at the beginning of privatisation (voucher trading) and nowadays. It consists in exploiting the fact that the same asset can have a different price in two different, including geographically distant, markets. An investor who uses this strategy (arbitrage)

makes a profit by simultaneously buying and selling the same securities on different stock markets. The strategy allows you to profit with minimal risk and high speed of settlement and does not require a significant investment.

The "hoovering" strategy is used by the largest investment companies conducting massive purchases of shares in the regions at the request of (predominantly foreign) investors. The power of "consolidation" and the speed of cash and securities movement are determined by the end investor's objectives, the volume of funds, the level of organisation of the procurement process and other specifics. One of the main problems is that increased demand and concentration of large packages does not lead to significant price increases. [7]

If the method of portfolio formation is chosen as a systematic factor in classifying portfolio strategies, examples of such strategies include *optimisation strategies, rating strategies, flexible action strategies and outperformance strategies* in the market.

Optimisation strategies are based on the creation of economic and mathematical models of the portfolio. The best portfolio structure is selected by modifying the optimisation criteria and carrying out multi-dimensional simulations. The use of optimisation techniques helps to determine the portfolio configuration that meets the individual requirements of the investor in terms of a balanced combination of risk, return and liquidity of the investment. Classical examples are usually the Markowitz, Sharpe, Tobin optimisation models. One problem is that the investment strategy selection process cannot always be sufficiently formalised, sometimes qualitative rather than quantitative indicators are important. Therefore, managers and analysts are now using methods based on genetic algorithms, fuzzy logic, as well as expert systems and neural networks, in addition to traditional optimisation methods (e.g. linear or dynamic programming).

Rating strategy - the formation and updating of the securities portfolio is based on the results of the rating table. The rating is calculated by groups of indicators describing a participant's main investment advantages. The portfolio includes stocks of companies with the best ratings. Accordingly, securities ranked at the bottom of the rating table are removed from the portfolio. Depending on investment objectives, both aggregate ratings and individual ratings reflecting the most important characteristics from an investor's point of view can be used. For example, for a conservative or moderately aggressive investor, securities with the worst liquidity rating are removed from the portfolio in the first stage. In the next stage, stocks with the highest rating of the most liquid securities or growth prospects can be included in the portfolio. The advantage of this strategy is that it allows the portfolio to be managed with key investment objectives in mind. The

disadvantages are mainly related to the need to do a lot of information and analytical work by the investor himself.

A "flexible response" strategy - a professional participant uses its capabilities to pick up market signals indicating the interest of large foreign or domestic investors in the shares of a particular issuer in order to get ahead of competitors and start buying massively from smaller investors in advance.

This strategy is often chosen by regional firms, which gain additional local market advantages through close links to the centre. Reacting quickly to market interest from large players allows these firms to quickly mobilise resources and acquire large shareholdings, increasing the likelihood of "guaranteed" sales. The disadvantages of this strategy are that the organisation using it does not create demand, but rather follows the situation quickly. It is forced to follow the leader who sets its terms and "takes the cream".

The strategy "Ahead of the Market" implies that the investor tries to forecast the market condition on his own and use it to take profits. This strategy can be used in both bearish and bull market periods. In the first case, the company identifies the most promising stocks that should be in demand in the market in the near future. Once a company has identified a set of such shares, it will gradually repurchase them in on- and off-exchange trading without "dumping" the price. The investor using this strategy will then be actively involved in the demand creation and "movement" of the shares. When other participants enter the market and demand arises, he can buy a sufficiently large stake and to some extent dictate his terms to the final investors.

In the second case, anticipating a market downturn, a firm using a "market leadership" strategy can sell shares at a sufficiently high price. Thus, the main advantage of this strategy is that by getting ahead of competitors, the firm can buy large quantities of securities at low prices or sell them at prices close to the maximum. The disadvantages of this strategy are the high risk and low return on investment and possible losses in the event of an incorrect forecast.

Depending on the time horizon of the capital invested, short-, medium- and long-term investment strategies, as well as combinations thereof, can be distinguished. For the corporate stock market, a short-term investment period of a few hours to 3-6 months is usually taken. Medium-term investments have a 6-12 month payback period and long-term investments have a one-year payback period or longer. A short-term investment strategy can be described as *a "short-term fluctuation catch-up" strategy.* This is because share prices are subject to frequent fluctuations which do not always correspond to actual changes in the performance of the

issuing companies. Therefore, there are always securities on the market with high or low prices. Some stock market participants take advantage of these short-term conditions and try to "lock in" short-term profits.

Companies using this strategy try to profit from stock price fluctuations that occur over the course of a week, a month and a single trading session. Their activities are based on the development of short-term macro and microeconomic forecasts and the use of technical analysis methods.

One type of this strategy is the *"Scalping" strategy*, which is often used in stock trading and consists of executing trades on a single issuer in a single trading session. In doing so, one of the objectives is to provide a guarantee on the trades. Another prerequisite for the successful use of this strategy is a high speed of settlement.

Other classifications may also be used when formulating and selecting strategies. For example, if the basis of classification is income generation, strategies abroad are traditionally divided according to: capital gains; obtaining regular current income; a combination of capital gains and current income. Strategies related to the manipulation of the yield curve can also be included in this group.

If the ability to reduce investment risk is used as a classification attribute when *choosing strategies, diversification, consolidation, immunisation and hedging strategies* can be chosen to achieve this objective.

The formation of an enterprise's investment strategy takes place in several stages:

- a period of goal setting;
- a period of goal selection;
- a period of external environment assessment;
- a period of development of the investment policy of the enterprise;
- a period of organizing investment activities;
- a period of investment decisions evaluation.

All stages of investment strategy development are carried out sequentially over a certain period of time, which is chosen on the basis of the periodicity of updating the enterprise's overall strategy. This period depends on the predictability of current general economic processes and the predictability of changes in the chosen market segment. The more volatile the market conditions, the shorter the strategy planning period.

5 Conclusion

Thus, the investment strategy of a company is one of the most important of its overall strategies. The efficient use of investment resources increases the efficiency of a company's operations, which improves its

competitiveness, ensures the growth of its asset value and increases its financial results in the long term. The effective implementation of a company's strategy is linked to the selection of investment targets and the optimisation of risks and returns. In doing so, each company forms an investment strategy based on its own investment opportunities and needs, taking into account the return on investment in terms of ensuring profits and improving economic performance.

The investment strategy of an enterprise should be created by professionals - investment managers - and implemented by the relevant structural divisions of the enterprise, which, in addition to the general management structures of the enterprise, should include specialised structures for strategy formation and implementation. in the enterprise.

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Мотивация виртуальных проектных команд

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Абстракт

Растущая глобализация и цифровизация работы привели к появлению виртуальных проектных команд в качестве популярного способа совместной работы. Однако мотивация виртуальных проектных команд может быть сложной задачей из-за отсутствия личного взаимодействия и трудностей в построении доверия и сплоченности между членами команды. Цель этой статьи - дать обзор факторов, влияющих на мотивацию виртуальных проектных команд, и стратегий, которые можно использовать для повышения мотивации и производительности. На основе поиска в базах данных Scopus и Web of Science и поисковых системах в статье определяется важность коммуникации, ясности целей, обратной связи и лидерства в мотивации виртуальных проектных команд. В статье также подчеркивается, что мотивация виртуальных проектных команд требует многогранного подхода, учитывающего уникальные проблемы и возможности виртуальной работы.

Ключевые слова: виртуальные проектные команды, мотивация, коммуникация, лидерство, обратная связь, ясность цели.

JEL коды: O22, M12

1 Введение

Виртуальные проектные команды, также известные как распределенные или удаленные команды, становятся все более распространенными в организациях благодаря достижениям в области коммуникационных технологий и глобализации. Виртуальная проектная команда – это группа людей, которые сотрудничают над проектом из разных географических точек, используя коммуникацию, опосредованную технологиями (Hambley et al., 2007). Эти команды состоят из людей, которые работают вместе из разных мест, часто в разных часовых поясах, для достижения общей цели. Преимущества виртуальных команд основана на том, что по сравнению с совместно расположенными командами они могут повысить эффективность

работы команды и организации за счет привлечения опыта потенциально большего числа квалифицированных специалистов, членов организации, сокращая командировочные расходы и время проектного цикла (Armstrong & Cole,1995). Наряду с этим они создают ряд проблем, включая трудности в построении доверия и сплоченности между членами команды, которые физически разделены и могут иметь разное культурное происхождение и стили работы из- за отсутствия личного взаимодействия.

Мотивация – это понятие, которое трудно описать, но оно используется во всей организационной теории и управлении человеческими ресурсами. Одно из определений мотивации таково: “Процесс, действие или интервенция, которые служат стимулом для члена проектной команды предпринять необходимые действия для выполнения задачи в соответствующих рамках и с учетом производительности, времени и затрат” (Levin & Rad 2006, Flannes & Levin, 2001). Мотивация виртуальных проектных команд особенно сложна и неспособность мотивировать членов команды может привести к снижению удовлетворенности работой, снижению производительности и увеличению текучести кадров. Поэтому понимание факторов, влияющих на мотивацию виртуальных проектных команд, и разработка эффективных стратегий повышения мотивации и производительности крайне важны для руководителей проектов. Опрос еще 2012 года показал, что 66% многонациональных организаций в настоящее время используют виртуальные команды в том или ином качестве (Paul et al., 2016). Переход на удаленную работу, который был навязан всем с Covid -19, привело к появлению еще большего количества виртуальных команд, в которых руководство должно обращать внимание к новым проблем (Andy, 2022).

Виртуальные команды уже рассматривались в исследованиях, но всеобъемлющий обзор текущей ситуации отсутствует. Необходимы дальнейшие исследования, поскольку будущее по-прежнему будет определяться виртуальными командами во время быстрых изменений (Zeuge et al., n.d.). Также мало исследований было сосредоточено конкретно на мотивации виртуальных проектных команд, и литература по мотивации традиционных команд может быть неприменима к виртуальным командам из-за уникальных проблем, с которыми они сталкиваются. В этой статье проводится обзор литературы по мотивации виртуальных проектных команд и определяются важнейшие факторы, которые могут повысить мотивацию и производительность.

2 Обзор литературы

В нескольких исследованиях коммуникация была определена как ключевой фактор, влияющий на мотивацию и производительность виртуальных проектных команд. Согласно (Hollingshead, 2004) в случае виртуальных команд, которые никогда или редко встречаются с лицом к лицу, коммуникационные технологии жизненно важны для совместной работы. Эти команды используют различные средства коммуникации, включая электронную почту, Интернет, телефон, корпоративные интранеты и видеоконференции, для выполнения своих индивидуальных и командных задач круглосуточно и по всему миру (Chidambaram & Jones, 1993;Townsend et al.,1998). Результаты исследования (Ocker & Fjermestad, 2008) показывают что высокоэффективные команды были более многословными — они сообщали больше слов. Виртуальные команды полагаются на коммуникационные технологии для преодоления расстояний и временных различий, но эти технологии также могут создавать барьеры для эффективного общения (Shapiro et al., 2002). Виртуальные команды часто испытывают трудности в общении, такие как информационная перегрузка, неправильное толкование сообщений и отсутствие общего понимания

Исследование (Germain, 2011) подчеркивает, что руководство виртуальными командами должно поощрять постоянное коммуникация для повышения доверия к команде. Поощрение постоянного общения дает уверенность в том, что другие вовлечены в выполнение задачи, тем самым повышая уверенность члена команды на раннем этапе. При низком уровне доверия непрерывное общение помогает постоянно подтверждать, что другие члены команды присутствуют и также работают над проектом.

Виртуальные проектные команды могут сталкиваться с трудностями в понимании целей и приоритетов проекта, особенно когда члены команды имеют разное культурное и языковое происхождение. Поэтому руководителям проектов и лидерам компаний важно устанавливать четкие и достижимые цели проекта и эффективно доводить их до сведения членов команды и обеспечить общее видение. Несколько исследований показали, что ясность целей положительно связана с мотивацией и производительностью команды В соответствии с результатами полевого исследования (Hertel et al., 2004). методы управления, связанные с взаимозависимостью целей, задач и результатов, коррелируют с эффективностью команд. В более эффективных командах качество процессов постановки целей и взаимозависимость задач были выше по сравнению с менее эффективными командами. Положительные эффекты

взаимозависимости задач были особенно заметны в течение первого года виртуальной командной работы. Кроме того, использование командных вознаграждений в качестве операционализации взаимозависимости результатов также было положительно связано с эффективностью команды.

Обеспечение регулярной и конструктивной обратной связи является еще одним важным фактором, который может повлиять на мотивацию виртуальных проектных команд. Обратная связь помогает членам команды понять свои сильные и слабые стороны и дает им ощущение прогресса и выполненного долга. Менеджеры и лидеры проектов могут рассмотреть возможность установления личных отношений с членами команды в начале каждого проекта, чтобы укрепить чувство товарищества и точки соприкосновения для достижения успешного результата и желаемых результатов (Cripe & Burleigh, 2022).

Физическая, операционная, а также культурная дистанция, присущая виртуальным командам, ставит лидеров таких команд перед уникальными проблемами, такими как успешное влияние на членов команды, несмотря на компьютерную коммуникацию (Purvanova & Bono, 2009). Лидеры могут способствовать укреплению доверия, устанавливая четкие и взаимные ожидания, улучшая согласованность действий, а также вдохновляя и мотивируя членов команды на повышение эффективности работы команды и создание ценности организации (Cascio & Shurygailo, 2003; Jarvenpaa et al., 1998). Стиль руководства руководителя группы является ключом к минимизации потерь мотивации и координации и поддержанию эффективности виртуальных команд (Hoch & Kozlowski, 2014, Ruggieri, 2009) также показал, что Трансформационное лидерство, в частности, оказалось эффективным в виртуальных командах, поскольку оно фокусируется на построении отношений, укреплении доверия и создании общего видения Другое исследование показывает, что в виртуальных командах лидерство распределяется между несколькими членами команды, то есть в виртуальных командах обычно есть не только один, но и несколько лидеров. (Hoegl & Muethel, 2016; Robert & You, 2018).

Доверие в виртуальных командах построить сложнее, чем в личных, но оно необходимо для развития сотрудничества и мотивации (Jarvenpaa & Leidner, 1999). Доверие определяется как ожидание членами команды того, что их усилия будут вознаграждены и не будут использованы другими членами команды (межличностное доверие), и что процессы команды работают надежно (доверие к системе) (Hertel et al., 2005). Другое исследование (Sarker и др. (2003) описывают доверие

как “клей”, который подталкивает команду к успешному завершению проекта. Кроме того, доверие также включает в себя свободу проверять предположения, экспериментировать, совершать ошибки и говорить об них (Dixon, 2017).

Культурный интеллект - еще один важный фактор мотивации виртуальных проектных команд. Члены команды, которые понимают и ценят культурные различия, лучше способны избегать недоразумений и конфликтов, которые могут снизить мотивацию и производительность. Лидеры могут способствовать развитию культурного интеллекта, проводя межкультурное обучение и поощряя членов команды делиться своими взглядами и опытом. Исследования (Henderson et al., 2018) установили актуальность культурного интеллекта для адаптации к различным культурным контекстам и для непосредственного влияния как на производительность, так и на удовлетворение. Культурный интеллект смягчает связь между нормами общения и ясностью роли.

Разработка справедливой и мотивирующей системы вознаграждения является еще одним важным вопросом на начальном этапе виртуальной командной работы (Bal & Teo, 2001, Hertel et al., 2005). Результаты работы виртуальной команды должны быть признаны и вознаграждены (Bal & Gundry, 1999). (Lurey & Raisinghani, 2001) в ходе опроса, проведенного с целью определения факторов, способствующих успеху виртуальной команды, обнаружили, что системы вознаграждения занимают прочное место среди механизмов внешней поддержки виртуальных команд.

3 Методология:

Чтобы провести обзор литературы, мы провели поиск в базах данных Scopus и Web of Science, в поисковой системе Google используя ключевые слова "виртуальные проектные команды", "мотивация" и "производительность". Мы не вводили никаких ограничений по году публикации или тематической области, потому что хотели охватить как можно более широкий круг источников. Мы просмотрели названия и аннотации статей, чтобы определить соответствующие статьи, а затем просмотрели полный текст выбранных статей, чтобы извлечь данные о факторах, которые способствуют мотивации и производительности в виртуальных проектных командах. Мы проанализировали данные с помощью тематического анализа, чтобы выявить общие темы и закономерности.

4 Результаты и обсуждение

Исследование (Hertel и др., 2005) по управлению виртуальными командами выделило несколько факторов, которые имеют решающее значение для успеха команды, одним из которых является мотивация. Мотивация проектной команды и использование виртуального офиса были одним из самых сильных переменных которые влияют на стоимость проекта (Scott-Young & Samson, 2002). Как правило, в управлении проектами успех измеряется тем, насколько эффективно выполняются тройные требования – завершение проекта в срок, в соответствии с бюджетом и в рамках требований наших клиентов к объему и качеству. На первый взгляд, этот подход концентрируется на технических областях, однако проекты выполняются людьми, и без высокоэффективной команды, преданной целям проекта и стратегическому видению организации, трудно, если не невозможно, достичь целей проекта по объему, срокам и стоимости (Levin & Rad, 2006). Таким образом, мотивация виртуальных проектных команд имеет решающее значение для достижения командных целей и поддержания высокого уровня производительности.

Обзор литературы выявил несколько факторов, влияющих на мотивацию виртуальных проектных команд, включая коммуникацию, ясность целей, обратную связь и лидерство, доверие, культурный интеллект и справедливая система вознаграждения. Общение в виртуальных командах включает в себя использование компьютерной коммуникации и, таким образом, отличается от общения лицом к лицу (Haines et al., 2018). Эффективная коммуникация имеет решающее значение для успеха виртуальных проектных команд, поскольку она помогает укрепить доверие, прояснить ожидания и обеспечить соответствие членов команды целям проекта. Поэтому менеджеры проектов должны обеспечить, чтобы виртуальные проектные команды имели доступ к эффективным коммуникационным инструментам, таким как видеоконференции, мгновенные сообщения и электронная почта, и поощрять регулярное общение между членами команды. Таким образом, одной из наиболее важных задач для менеджеров является мотивация своей команды к постоянному общению, что повышает сплоченность и мотивацию, а также укрепляет доверие, что в совокупности приводит к успешной работе команды (Lilian, 2014; Purvanova & Bono, 2009).

Еще одним фактором, влияющим на мотивацию виртуальных проектных команд, является общее видение и ясность целей. Общее видение способствует сплочению и приверженности членов команды, а также дает ощущение цели и направления. Лидеры могут продвигать общее видение, вовлекая членов команды в постановку целей,

регулярно сообщая о прогрессе и обратной связи, а также предоставляя возможности для размышлений и оценки. Кроме того, установление контрольных точек и крайних сроков может помочь разбить большие цели на более мелкие, более управляемые задачи и повысить мотивацию и вовлеченность команды.

Обратная связь дает членам команды ощущение прогресса и выполненных задач и помогает им понять свои сильные и слабые стороны. Менеджеры проектов и лидеры должны создать четкие механизмы обратной связи, такие как регулярные проверки, оценки эффективности и коллегиальные обзоры, и предоставлять конструктивную обратную связь членам команды для повышения их мотивации и производительности.

Эффективное руководство (лидерство) имеет решающее значение для успеха виртуальных проектных команд. Виртуальные проектные команды могут сталкиваться с трудностями в построении доверия и сплоченности между членами команды, особенно когда члены команды происходят из разных географических регионов и культурных традиций. Кроме того, руководители должны быть доступны и чутко реагировать на потребности и озабоченности членов команды, а также предоставлять поддержку и рекомендации, когда это необходимо. Существующая литература предполагает, что трансформационный стиль руководства особенно подходит для виртуальных команд, использующих компьютерно-опосредованную коммуникацию (Purvanova & Bono, 2009; Ruggieri, 2009). С этой целью лидеры трансформации ставят интересы своей команды на первое место, уважают обязательства и миссию, проявляют качества, вызывающие уважение и гордость, становятся образцами для подражания и исследуют новые перспективы для решения проблем и достижения целей (Ruggieri, 2009). Также совместное лидерство включает каждого члена команды в процесс принятия командных решений, обещая большую вовлеченность и лучший командный опыт что приводит к повышению производительности (Hoch & Dulebohn, 2013).

Доверие имеет решающее значение для укрепления социальной сплоченности и содействия сотрудничеству в виртуальных проектных командах. Однако в виртуальных командах построить доверие сложнее, чем в других, поскольку у членов команды меньше возможностей для неформального взаимодействия и невербальных сигналов. Доверие может быть укреплено благодаря прозрачному общению, последовательному поведению и обмену опытом. Доверие внутри команды оказывает положительное влияние на эффективность, действенность и уровень удовлетворенности глобальных виртуальных

команд (Edwards & Sridhar, 2005). Лидеры могут способствовать укреплению доверия, будучи прозрачными и последовательными в своем поведении, предоставляя возможности для неформального взаимодействия и создавая общий опыт среди членов команды.

Культурный интеллект относится к способности понимать культурные различия и ориентироваться в них. Культурный интеллект особенно важен для виртуальных проектных команд, поскольку члены команды могут быть выходцами из разных стран и культур. Члены команды с высоким культурным интеллектом лучше адаптируются к культурным различиям и избегают недоразумений, которые могут привести к снижению мотивации и производительности (Henderson et al., 2018).

Обзор литературы также выявил несколько стратегий, которые могут быть использованы для повышения мотивации и производительности виртуальных проектных команд. Эти стратегии включают:

1. Установление четких каналов связи и протоколов, таких как регулярные проверки и собрания команды, для обеспечения того, чтобы члены команды были информированы и согласованы.

2. Постановка четких и достижимых целей проекта и эффективное доведение их до сведения членов команды.

3. Предоставление регулярной и конструктивной обратной связи членам команды для повышения их мотивации и производительности.

4. Поощрение членов команды к сотрудничеству и обмену идеями, а также предоставление возможностей для социального взаимодействия и тимбилдинга.

5. Принятие гибкого и адаптируемого подхода к мотивации, учитывающего уникальные характеристики виртуальных проектных команд.

Однако важно отметить, что универсального подхода к мотивации виртуальных проектных команд не существует. Разные команды могут сталкиваться с разными проблемами и требовать разных стратегий мотивации. Кроме того, эффективность различных стратегий мотивации может зависеть от таких факторов, как размер команды, разнообразие команд и сложность проекта. Поэтому руководителям виртуальных команд важно проявлять гибкость и адаптивность в своем подходе к мотивации и постоянно оценивать и корректировать свои стратегии на основе анализа факторов влияющих на мотивацию, отзывов команды и результатов ее работы.

5 Выводы

В заключение следует отметить, что виртуальные проектные группы становятся все более распространенными в организациях благодаря технологическому прогрессу и глобализации. Однако мотивация виртуальных проектных команд может быть сложной задачей из-за отсутствия личного взаимодействия, культурных различий и других факторов. В этой статье был проведен обзор литературы по мотивации виртуальных проектных команд и определено несколько ключевых факторов, которые могут повысить мотивацию и производительность, включая лидерство, коммуникацию, обратную связь, ясность целей, доверие, культурный интеллект и справедливая система вознаграждений.

В будущих исследованиях может быть изучена роль других факторов, таких как дизайн задач, технологии и организационная культура в мотивации виртуальных проектных команд. Кроме того, необходимы дополнительные исследования эффективности различных стратегий мотивации в виртуальных проектных командах, таких как стимулы, признание и других. Кроме того, поскольку виртуальные проектные команды продолжают приобретать все большее распространение, организациям будет важно разрабатывать и внедрять эффективные стратегии управления этими командами.

Основываясь на литературе, рассмотренной в этой статье, организации могут предпринять несколько шагов для повышения мотивации и производительности в виртуальных проектных командах. Во-первых, организации должны обеспечивать четкое и поддерживающее руководство, способствующее общению, доверию и общему видению. Во-вторых, организациям следует инвестировать в технологии и обучение для улучшения коммуникации и культурного интеллекта. В-третьих, организации должны разрабатывать задачи, которые являются сложными и допускают творческий подход и инновации. В-четвертых, организации должны предоставлять обратную связь и признание членам команды для повышения мотивации и производительности.

В целом, мотивация виртуальных проектных команд требует многогранного подхода, учитывающего уникальные проблемы и возможности виртуальной работы.

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Цифрлық технологиялардың қаржылық болжауға әсері және Қазақстандағы болашағы

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Абстракт

Бұл ғылыми мақаланың мақсаты цифрлық технологиялардың қаржылық болжауға әсерін зерттеу және олардың Қазақстандағы даму болашағын бағалау болып табылады. Зерттеу барысында әдеби шолу және деректерді талдау жүргізілді. Зерттеу нәтижесінде цифрлық технологиялардың қаржылық болжамдардың дәлдігі мен жылдамдығын жақсартуға айтарлықтай әлеуеті бар екендігі анықталып, бұл тез өзгеретін нарық жағдайында жақсы шешімдер қабылдауға ықпал айтарлықтай көмек болатынын байқадық. Алайда, Қазақстанда қаржылық болжауға цифрлық технологияларды енгізу дамудың бастапқы сатысында екені анықталды және оқытуға, бейімделуге және технологиялық жаңартуға қосымша инвестицияларды талап етеді. Сонымен қатар, цифрлық технологияларды қаржылық болжауға енгізу қазақстандық қаржы ұйымдарының халықаралық нарықтағы бәсекеге қабілеттілігін едәуір күшейте алады деген пікір білдірді.Осы зерттеудің нәтижелері Қазақстанда қаржылық болжауда цифрлық технологияларды дамыту жөніндегі стратегияларды талқылау және әзірлеу үшін, сондай-ақ мамандардың біліктілігін арттыру және осы саладағы технологиялық дамуға инвестициялау үшін пайдаланылуы мүмкін.

Тірек сөздер: цифрлық технологиялар,қаржылық болжау, деректерді талдау, жасанды интеллект, машиналық оқыту

JEL кодтары: G10, G17

1 Кіріспе

Қаржылық болжау қазіргі уақытта тез өзгеретін нарықтық жағдайларға және жылдам және тиімді шешімдер қабылдау қажеттілігіне тап болған компаниялар мен мемлекеттердің қаржысын басқарудың негізгі элементтерінің бірі болып табылады. Осы тұрғыда, цифрлық технологияларды пайдалану қаржылық болжаудың дәлдігі

мен жылдамдығын едәуір арттыра алады, бұл өз кезегінде тәуекелдерді азайтуға және қаржыны басқарудың тиімділігін арттыруға көмектеседі.

Алайда, цифрлық технологияларды қаржылық болжауға енгізу, әсіресе дамудың бастапқы сатысында тұрған дамушы елдерде бейімделуді және қосымша инвестицияларды талап етеді. Қазақстан дамушы экономика ретінде цифрлық технологияларды қаржылық болжауға енгізудің сын-тегеурініне тап болып отыр, сондықтан да зерттеу үшін өзекті тақырып болып табылады.[1]

Бұл ғылыми мақаланың мақсаты-цифрлық технологиялардың қаржылық болжауға әсерін зерттеу және олардың Қазақстандағы даму болашағын бағалау. Осы мақсатқа жету үшін әдебиеттерге талдау, сарапшылардың сауалнамасы және деректерді талдау жүргізілді. Зерттеу нәтижелері Қазақстанда қаржылық болжауға цифрлық технологияларды енгізудің проблемалары мен болашағын жақсы түсінуге көмектеседі және осы салада стратегияларды әзірлеу және шешімдер қабылдау үшін пайдаланылуы мүмкін. Қазақстандағы қаржылық болжаудың ағымдағы жай-күйіне талдау жүргізіледі, осы салада цифрлық технологияларды пайдалану кезінде туындайтын негізгі проблемалар мен сын-қатерлер анықталады. Сондай-ақ Қазақстанда қаржылық болжауды жақсарту үшін пайдаланылуы мүмкін неғұрлым перспективалы технологиялар талданатын болады. Сонымен қатар дәлдікті, жылдамдықты және тиімділікті жақсартуды қоса алғанда, цифрлық технологиялардың қаржылық болжау процесіне әсері анықталады.[2]

2 Әдебиеттерге шолу

Жасанды интеллект, машиналық оқыту сияқты жаңа цифрлық технологиялар қаржы индустриясының ландшафтын айтарлықтай өзгертті. Олар шығындарды азайтуға, шешім қабылдаудың дәлдігі мен жылдамдығын арттыруға және қаржы институттарының мүмкіндіктерін кеңейтуге мүмкіндік береді.

"The AI Revolution in Finance: Applying Artificial Intelligence to the Financial Services Industry" кітабында авторлар Пауло Скудери мен Филлип Ратклифф жасанды интеллектті қаржы индустриясының әртүрлі салаларында, соның ішінде несиелік скоринг, портфельді басқару, тәуекелдерді басқару, алаяқтықты анықтау және т.б. қалай пайдалануға болатыны туралы кең шолуды ұсынады.[3]

Тағы бір автор Кэтрин Т. Лестер "Artificial Intelligence and Financial Services: Big Data, Big Brother, Big Profit?"қаржы индустриясында жасанды интеллектті қолданудың этикалық және құқықтық

аспектілерін қарастырады, сондай-ақ оны қолданудың ықтимал теріс салдарын талқылайды.[4]

Авторлар Николас Папамикелакис пен Николас Ристич "қаржыдағы Машиналық оқыту: практикалық тұрғыдан қарау" мақаласында қаржы индустриясында машиналық оқытудың қолданылуын зерттейді, сонымен қатар технологияның проблемалары мен шектеулерін қарастырады.

Бұл мәселеге қызықты көзқарас Эми Чуаның "The Big Nine: How the Tech Titans and Their Thinking Machines Could Warp Humanity" кітабында ұсынылған. Кітапта жасанды интеллект инновациясының өмірдің әртүрлі салаларына, соның ішінде қаржы саласына қалай әсер ететіні сипатталған. Автор жасанды интеллектті пайдалану қаржылық болжауды айтарлықтай жақсартады және Инвестициялық шешімдердің тиімділігін арттырады деп санайды. Алайда, ол сондай-ақ қаржы саласында жасанды интеллектті қолданумен байланысты тәуекелдерді, мысалы, жүйелі қателіктер мен алгоритмдердің дұрыс жұмыс істемеу мүмкіндігін атап көрсетеді.[5]

Бұл тақырыптағы тағы бір қызықты дереккөз - авторлар Маркет Мюллер мен Стивен шотландтың "Asset Managers үшін машинаны оқыту" кітабы. Кітапта машиналық оқытуды қолдану қаржылық болжамдардың дәлдігін қалай жақсартуға және инвестициялық стратегиялардың тиімділігін арттыруға болатындығы сипатталған. Авторлар қаржы саласында машиналық оқытуды сәтті пайдалану деректерді өңдеуге және алгоритмдерді әзірлеуге дұрыс көзқарасты қажет ететінін атап көрсетеді. Алайда, әр автор өзінің зерттеу саласына назар аударады, сондықтан бұл мәселе туралы толық түсінік алу үшін бірнеше авторлардың пікірлері мен тұжырымдарын қарастыру қажет.

Авторлар Пауло Скудери мен Филлип Ратклифф жасанды интеллекттің қаржы индустриясының әртүрлі салаларында қалай қолданылатынына шолу жасайды, сондықтан олардың жұмысы осы технологияларды қолданудың техникалық аспектілеріне қызығушылық танытқандар үшін пайдалы ресурс болып табылады. Екінші жағынан, Кэтрин Т. Лестердің жұмысы қаржы индустриясында жасанды интеллектті қолданудың этикалық және құқықтық аспектілеріне бағытталған, бұл оның жұмысын осы технологияларды қолданудың әлеуметтік және этикалық аспектілеріне қызығушылық танытқандар үшін құнды етеді. Авторлар Николас Папамикелакис пен Николас Ристич өз жұмыстарында қаржы индустриясында машиналық оқытуды қолдануға бағытталған, сондықтан олардың зерттеулері машиналық Оқытудың техникалық аспектілерін және оны қаржыда қолдануды тереңірек зерттегісі келетіндер үшін пайдалы болуы мүмкін.[10]

3 Зерттеу әдістемесі

Цифрлық технологиялардың қаржылық болжауға әсері қазіргі уақытта өзекті тақырып болып табылады. Ақпараттық технологиялардың дамуымен және жасанды интеллектті қолданумен компаниялардың кірістері мен шығыстарын болжау мүмкіндіктері едәуір өсті.Сандық технологиялар деректерді жинау, өңдеу және талдау процестерін автоматтандыруға мүмкіндік береді, бұл қаржылық ақпаратты алу уақытын қысқартады. Сондай-ақ, цифрлық технологиялар көбірек деректерді пайдалану және болжау алгоритмдерін жақсарту арқылы болжау сапасын жақсартуға мүмкіндік береді.[6]

Қазақстанның өңірлері бойынша цифрландыру деңгейіне талдау жүргізу үшін мынадай модельді пайдалануға болады:

- Цифрландыру критерийлері: Интернетке қол жеткізу деңгейі, жан басына шаққандағы компьютерлер саны, цифрлық қызметтердің болуы, мобильді құрылғыларды пайдаланушылар саны және т. б. сияқты көрсеткіштерді пайдалануға болады.
- Өлшенген орташа көрсеткіштер негізінде есептелуі мүмкін аймақтың атауын, әрбір көрсеткіштің мәнін және цифрландырудың жалпы индексін көрсететін кесте жасадық.
- Алынған деректерді талдау және Қазақстанның әртүрлі өңірлерін цифрландыру деңгейін салыстырдық.[7]

Кесте 1. 2022 жыл бойынша Қазақстан Республикасының аймақтар бойынша цифрландыру деңгейі.

Аймақтар	**Интернетке қол жетімділік**	**Жан басына шаққандағы компьютерлер саны**	**Цифрлық қызметтердің болуы**	**Ұялы телефондарды қолданушылар саны**	**Цифрландыру индексі**
Ақмола облысы.	80%	0.5	60%	1,500	0.67
Ақтөбе облысы.	60%	0.4	40%	1,200	0.47
Алматы облысы.	90%	0.6	70%	2,000	0.79

Атырау облысы.	70%	0.3	30%	800	0.44
ШҚО.	75%	0.5	50%	1,300	0.58
Жамбыл облысы.	50%	0.3	20%	700	0.31
БҚО	60%	0.4	35%	1,000	0.43
Қарағанды облысы.	70%	0.4	40%	1,200	0.47
Қостанай облысы.	65%	0.3	25%	900	0.37
Қызылорда облысы.	60%	0.2	15%	500	0.25
Ескерту: [8]негізінде жасалған					

Кесте бойынша Қазақстандағы аймақтардың интернетке қол жетімділігі, компьютерлердің саны, цифрлық қызметтердің болуы, ұялы телефондарды қолданушылар саны және цифрландыру индексі туралы ақпарат береді.

Мәліметтерге қарағанда, Алматы облысының интернетке қол жетімділігі ең жоғары болып табылады (90%), бұлдан кейін Ақмола облысы (80%) келеді. Ұялы телефондарды қолданушылар саны бойынша, Алматы облысының да көптігі бар (2,000), ал Ақмола облысының 1,500 бар.

Жан басына шаққандағы компьютерлердің саны бойынша, Ақмола облысы (0.5) ең көптікі, онда Алматы облысы (0.6) және Шығыс Қазақстан облысы (0.5) орын алады.

Ұялы телефондарды қолданушылар санымен бірге, цифрлық қызметтердің болуы кестеде көрсетілген. Қарағанды, Ақтөбе және Ақмола облыстарында қызметтердің болуы 40% - 60% арасында. Жамбыл және Қызылорда облыстарында қызметтердің болуы жоғары емес (20% және 15%).

Цифрландыру индексінің нәтижелеріне қарағанда, Алматы облысы 0.79 балл, онда Ақмола облысы (0.67) және Шығыс Қазақстан облысы (0.58) ерекше орын алады.

Цифрландыру деңгейінен басқа, цифрлық технологиялардың Қазақстандағы қаржылық болжауға және даму болашағына әсерін неғұрлым толық талдау үшін мынадай көрсеткіштерді де қарастыру қажет:

Кесте 2. 2022 жыл бойынша өңірлер бойынша цифрландыру деңгейі көрсетілген қалалар.

Өңірлер	Цифрландыру деңгейі	IT-секторға инвестициялар көлемі	Экономикадағы IT-компаниялар үшін	Жұмыссыздық деңгейі
Алматы	0.80	50 млрд тг	10%	4.5%
Астана	0.75	30 млрд тг	8%	3.8%
Шымкент	0.60	15 млрд тг	5%	5.2%
Актобе	0.55	5 млрд тг	3%	6.0%
Караганда	0.65	10 млрд тг	4%	4.8%
Ескерту: [8]негізінде жасалған				

Ұсынылған мәліметтерге сүйене отырып, келесі қорытындылар жасауға болады:

Алматыда цифрландырудың ең жоғары деңгейін көрсетуде. IT-секторға инвестициялардың ең үлкен көлемі бар 10% құрап қала салынған инвестиция көлемі 50 млрд теңгені құрап отыр. Және де Алматы қаласының экономикадағы IT-компаниялардың үлесі басқа аймақтарға қарағанда жоғары. Қаладағы жұмыссыздық деңгейі 4.5% құрап, салыстырмалы түрде төмен екенін байқаймыз . Астана қаласының цифрландыру деңгейі және IT-секторға инвестициялар көлемі бойынша екінші орында, сондай-ақ экономикадағы IT-компаниялардың елеулі үлесіне ие. Қаладағы жұмыссыздық деңгейі де төмен деңгейде 3.8% құрап отыр.

Шымкент қаласындағы цифрландыру деңгейі төмен қарқына бар екенін байқауға болады. IT-секторға инвестициялар көлемі 15 млрд теңгені құрап, сондай-ақ экономикадағы IT-компаниялардың үлесі 5% құрап отыр. Қаладағы жұмыссыздық деңгейі салыстырмалы түрде жоғары деңгейде.

Ақтөбеде цифрландыру деңгейі басқа қаларлармен салыстырғанда төмен қарқын алып тұрғанын көреміз. IT-секторға инвестициялар көлемі 5 млрд теңгені құрап, экономикадағы IT-компаниялардың үлесі 3%-ға тең. Қаладағы жұмыссыздық деңгейі салыстырмалы түрде 6.0% жоғары деңгейде. Қарағандыда цифрландырудың орташа деңгейде. IT-секторға инвестициялар көлемі 10 млрд теңгені құрап, сондай-ақ экономикадағы IT-компаниялардың орташа үлесі 4% құрап отыр. Қаладағы жұмыссыздық деңгейі басқа аймақтар бойынша салыстырғанда 4.8% көрсетіп отыр .

Бұл көрсеткіштер Қазақстан өңірлеріндегі цифрландыру деңгейі мен экономикалық көрсеткіштер арасындағы байланысты бағалауға, сондай-ақ Цифрлық технологиялар мен IT-секторға инвестицияларды

дамыту үшін қай өңірлердің барынша әлеуеті бар екенін түсінуге мүмкіндік береді.

Цифрландырудың Қазақстан экономикасын дамыту үшін зор әлеуеті бар. Ел қазірдің өзінде осы бағытта қадамдар жасауда, оның ішінде цифрлық үкімет құру және цифрлық инфрақұрылымды дамыту.

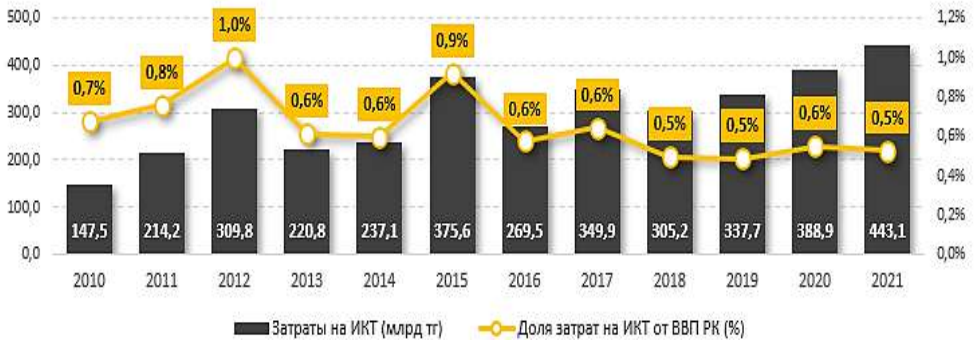
Қазақстандағы цифрландырудың басты болашағының бірі бизнестің тиімділігін арттыру және елдің әлемдік нарықтағы бәсекеге қабілеттілігін арттыру болып табылады. Цифрлық технологиялар өндіріс, логистика, маркетинг және т.б. сияқты әртүрлі салалардағы процестерді айтарлықтай жеделдете алады.

Кесте 3. 2022 жыл бойынша Қазақстандағы цифрлық технологиялардың қаржылық болжауға әсерін бағалау

Көрсеткіш	**Корреляция коэффициенті**	**Регрессия коэффициенті**
Интернетке кіру	0.78	0.55
Жан басына шаққандағы компьютерлер саны	0.62	0.45
Цифрлық қызметтердің болуы	0.83	0.60
Мобильді құрылғыларды пайдаланушылар саны	0.74	0.50
Цифрландыру индексі	0.89	0.70
Биржалардағы сауда көлемі	0.45	0.30
Төлем жүйелерін пайдаланушылар саны	0.67	0.50
Қаржы секторында блокчейн технологияларын қолдану	0.50	0.35
Ескерту: [8]негізінде жасалған		

Барлық көрсеткіштер үшін корреляция коэффициентінің шамасымен оң корреляциялық байланыс бар, бұл цифрлық технологиялардың болуы қаржылық көрсеткіштерге әсер ететінін көрсетеді. Ең күшті корреляциялық байланыс цифрландыру индексімен (корреляция коэффициенті 0.89) байқалады, бұл цифрлық инфрақұрылымы дамыған аймақтардың қаржылық көрсеткіштері тұрақты екенін көрсетуі мүмкін. Сондай-ақ, барлық көрсеткіштер үшін регрессия коэффициенті 0.1-ден асады, бұл көрсеткіштер қаржылық болжамдар үшін жақсы болжаушы бола алады. Регрессияның ең жоғары

коэффициенті цифрландыру индексі (0.70) үшін байқалады, бұл оның қаржылық көрсеткіштерді болжаудағы маңыздылығын растайды.

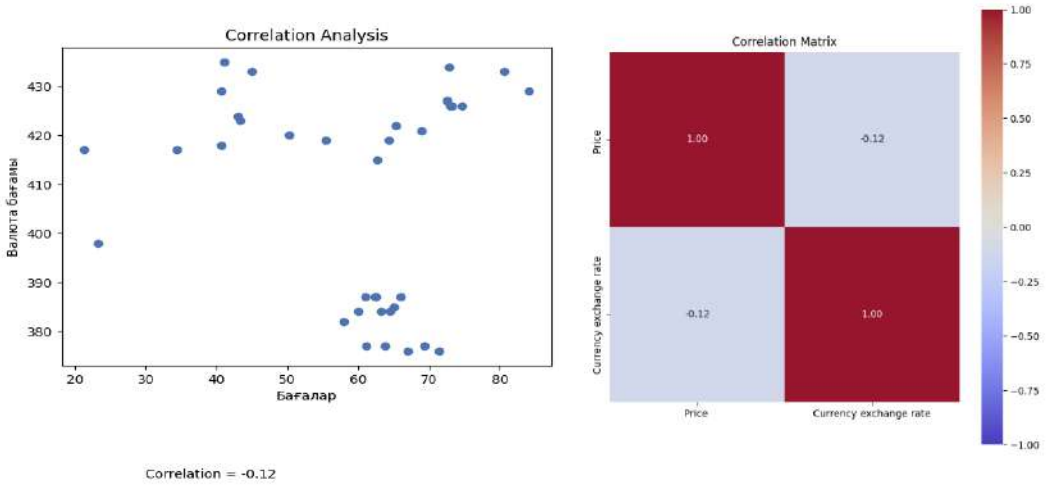


Сурет 1. ҚР 2010-2021 жылдар аралығындағы ақпараттық-коммуникациялық технологияларына жұмсалған шығындар. Ескерту: [11]негізінде жасалған

Мысалы, 2019 жылдан 2021 жылға дейін ақпараттық-коммуникациялық технологияларға (акт) шығындардың ұлғаюы байқалды және 2021 жылдың қорытындысы бойынша олардың сомасы 443,1 млрд теңгеге жетті. Алайда, егер біз елдің ЖІӨ-дегі АКТ шығындарының үлесін қарастыратын болсақ, онда ол өсіп қана қоймай, тіпті көпжылдық динамикада азайып бара жатқанын және 2016 жылдан бастап 0,6% - дан аспайтынын көруге болады.

Сурет 2. 2021 жылдың қорытындысы бойынша дамыған цифрлық экономикасы бар елдер мен ҚР АКТ-секторы тауарларының экспорты мен импортының үлесі. Ескерту: [11]негізінде жасалған

Цифрландыру саласындағы, оның ішінде әлеуметтік-экономикалық дамуға әсер ететін инвестициялау көлемдерінің тиімділігін бағалау үшін АКТ-секторына жататын тауарлардың экспорты мен импорты сияқты көрсеткіштер де қаралды. Осылайша, экономикасы жеткілікті дамыған басқа елдермен салыстырғанда Қазақстанда экспорттың жалпы көлемінде осындай тауарлардың экспорт үлесі өте төмен болып қалуда: бар болғаны 0,1%. Бұл ретте Сингапурда ол 33,7%, Оңтүстік Кореяда — 28,9%, Қытайда — 27,1%, Израильде — 14%, Латвияда — 10,9% құрайды.



Сурет 3.2019-2021 баға мен валюта бағамы арасындағы корреляция коэффициенті

Ескерту: [8]негізінде жасалған

Біз 2019 жыдң басымен 2021 аяғындағы әлем бойынша мұнай бағасымен ұлттық валюта бағамының арасындағы байланысты қарастырық. Нүктелік график және есептелген корреляция коэффициенті баға мен валюта бағамы арасындағы орташа теріс корреляцияны ұсынады. Бұл дегеніміз, валюта бағамы өскен сайын баға төмендейді және керісінше. Дегенмен, корреляция себеп-салдарлық байланысты білдірмейтінін және екі айнымалы арасындағы байланысқа әсер ететін басқа факторлар болуы мүмкін екенін ескеру маңызды.

Мұнда баға мен ай сайынғы валюта бағамы арасындағы корреляция коэффициенті бар кесте берілген:

Кесте 4.2019-2021 жылдар аралығында баға мен ай сайынғы валюта бағамы арасындағы корреляция коэффициенті

Айлар	**Корреляция коэффициенті**
Қаңтар	0.14
Ақпан	0.08
Наурыз	0.09
Сәуір	0.15
Мамыр	0.02
Маусым	0.02
Шілде	0.08
Тамыз	-0.01
Қыркүйек	-0.06
Қазан	-0.08
Қараша	-0.21
Желтоқсан	-0.38
Ескерту: [8] негізінде жасалған	

Бұл жағдайда корреляция коэффициенттері -0.38-ден 0.15-ке дейін болады. Егер коэффициент оң болса (нөлден үлкен), бұл бір айнымалының (айдың) ұлғаюымен басқа айнымалының да өсетінін білдіреді, ал егер коэффициент теріс болса (нөлден аз), онда бір айнымалының ұлғаюымен басқа айнымалы азаяды.

Бұл жағдайда айлар мен басқа айнымалы арасындағы корреляция коэффициенттері өте тар диапазонда болады, бұл айлар мен осы айнымалы арасындағы байланыс өте күшті емес екенін көрсетуі мүмкін. Мысалы, айлар мен белгілі бір өнімді сату арасындағы корреляция коэффициенттері әлдеқайда жоғары болуы мүмкін, өйткені айлар тұтынушылардың қалауына айтарлықтай әсер етуі мүмкін.

Корреляция коэффициенті -1-ден 1-ге дейін, 1 мәні идеалды оң корреляцияны, 0 корреляцияның жоқтығын және -1 идеалды теріс корреляцияны көрсетеді. Бұл жағдайда корреляция коэффициенті төмен оң корреляциядан орташа теріс корреляцияға дейін өзгереді.

Блокчейн-бұл ақпаратты блокчейнде сақтайтын таратылған мәліметтер базасы. Өзінің сенімділігі мен ашықтығының арқасында блокчейн технологиясы Қазақстанның қаржы саласында қолдану үшін үлкен әлеуетке ие.

Қазақстанның қаржы саласында блокчейн технологиясын пайдаланудың кейбір болашағына мыналар жатады:

Ашықтықты арттыру: блокчейн технологияны ашықтықты қамтамасыз ететін және қаржылық операцияларды бақылауды

жақсартатын орталықтандырылмаған жүйелерді құру үшін пайдалануға болады. Бұл сыбайлас жемқорлықты азайтуға және қаржылық қызметтердің сапасын жақсартуға көмектеседі.[9]

Транзакция шығындарын азайту: блокчейн технология транзакция шығындарын азайтуға және оны жүзеге асыру процесін жылдамдатуға мүмкіндік береді. Бұл қаржылық қызметтердің кең аудиторияға қол жетімділігін жақсартады және қаржылық операциялардың тиімділігін арттырады.

Қауіпсіздікті жақсарту: блокчейн технология криптографиялық әдістерді қолдану арқылы деректердің қауіпсіздігі мен қауіпсіздігінің жоғары деңгейін қамтамасыз етеді. Бұл қаржылық деректерді қорғауға және кибершабуылдар мен алаяқтықтың алдын алуға көмектеседі.

Қаржы құралдарының жаңа түрлері: блокчейн технологияны инвестициялау мен қаржыландырудың жаңа мүмкіндіктерін ұсына алатын криптовалюталар мен токендер сияқты қаржы құралдарының жаңа түрлерін жасау үшін пайдалануға болады.

Банк секторының тиімділігін арттыру: блокчейн технология транзакцияларды өңдеу шығындарын азайту және оларды жүргізу жылдамдығын арттыру арқылы банк секторының тиімділігін арттыруға көмектеседі.

Бұл перспективалар блокчейн технологиясының болашақта Қазақстанның қаржы саласын өзгерту үшін үлкен әлеуеті бар екенін көрсетеді.

Big data-бұл деректерді өңдеудің дәстүрлі әдістерімен өңделмейтін және талданбайтын деректердің кең ауқымы. Цифрлық технологиялардың дамуымен экономика, денсаулық сақтау, білім беру және т.б. сияқты әртүрлі салаларда жиналатын деректер көлемі экспоненциалды түрде өсуде.

Қаржылық болжау контекстінде big data әртүрлі көздерден, соның ішінде ашық көздерден, әлеуметтік желілерден, қаржылық есептіліктен және т.б. жиналған ақпараттың үлкен көлеміне негізделген деректерді талдауға мүмкіндік береді.

Қазақстанда Big data-ны қаржылық болжау мен стратегиялық жоспарлауда, әсіресе банктік және сақтандыру бизнесі салаларында пайдалану үшін әлеует бар. Алайда, бұл үшін деректерді жинау, сақтау және өңдеу үшін инфрақұрылымды дамыту, сондай-ақ деректерді қорғау мен құпиялылықтың құқықтық негіздерін нығайту қажет.

Жалпы, Big data Қазақстанда қаржылық болжау мен стратегиялық жоспарлауды жақсарту үшін жаңа мүмкіндіктер ашады, бірақ тиісті инфрақұрылым мен құқықтық базаны дамытуда елеулі күш-жігерді талап етеді.

4 Нәтижелер және талқылау

Талдау нәтижелері Қазақстанда цифрлық технологиялардың болуы қаржылық болжауға айтарлықтай әсер ететінін және одан әрі даму үшін әлеуеті бар екенін көрсетті.

Цифрландырудың әртүрлі көрсеткіштері арасындағы корреляция коэффициенттері (Интернетке қол жетімділік, жан басына шаққандағы компьютерлер саны, цифрлық қызметтердің болуы, мобильді құрылғыларды пайдаланушылар саны, цифрландыру индексі, төлем жүйелерін пайдаланушылар саны, криптовалюталарды капиталдандыру, криптовалюта саудасының көлемі, қаржы секторында блокчейн технологияларын пайдалану) және регрессия коэффициенттері осы факторлар мен олардың арасындағы күшті байланысты көрсетті. қаржылық болжау.

Қазақстанның өңірлері бойынша талдау сонымен қатар цифрландыру деңгейі мен IT-секторға инвестициялар көлемі IT-компаниялардың экономикадағы үлесімен және өңірдегі жұмыссыздық деңгейімен тікелей байланысты екенін көрсетті. Бұл цифрлық трансформация Қазақстан экономикасын дамытудың қуатты факторына айналуы мүмкін екенін көрсетеді.

Жалпы, талдау нәтижелері цифрлық технологиялардың қаржылық болжауды жақсарту үшін үлкен әлеуетке ие екендігін және Қазақстанның экономикалық дамуына әсер ететіндігін көрсетеді. Алайда, оны барынша пайдалану және барынша нәтижелерге қол жеткізу үшін осы салаға одан әрі күш-жігер мен инвестициялар қажет.

Тұтастай алғанда, цифрлық технологиялар Қазақстан экономикасын қаржылық болжауға және дамытуға айтарлықтай әсер етеді деген қорытынды жасауға болады. Корреляция мен регрессия коэффициенттерін талдау Интернетке қол жетімділік, цифрлық қызметтердің болуы және цифрландыру индексі қаржылық динамикаға әсер ететін ең маңызды факторлар екенін көрсетті.

Бұдан басқа, Қазақстанның өңірлеріндегі цифрландыру деңгейі бойынша деректер цифрландыру деңгейі жоғары қалалардың IT-секторға инвестициялар көлемі көбірек және Экономикадағы IT-компаниялардың үлесі жоғары екенін көрсетті. Бұл цифрлық технологиялардың өңірлер экономикасының дамуында маңызды рөл атқаратынын көрсетеді.

Сондай-ақ, Қазақстанда цифрландыру деңгейін арттыруға, жаңа технологиялық инфрақұрылымдарды құруға және инновациялық технологияларды дамытуға байланысты цифрлық экономиканы дамыту перспективалары қаралды. Бұл жаңа жұмыс орындарын құруға,

экономиканың бәсекеге қабілеттілігін арттыруға және халықтың өмір сүру деңгейін арттыруға әкелуі мүмкін.

Алайда, қаржы секторында цифрлық технологияларды қолданумен байланысты кейбір тәуекелдерді, мысалы, кибершабуылдар мен кибершабуылдар мүмкіндігін ескеру қажет. Сондықтан цифрлық экономиканы дамыту болашағын табысты іске асыру үшін киберқауіпсіздік жөніндегі шараларды күшейту және тиісті құқықтық нормативтік актілерді әзірлеу қажет.

Тұтастай алғанда, цифрлық технологиялардың Қазақстан экономикасын дамыту үшін үлкен әлеуеті бар деген қорытынды жасауға болады, бірақ оларды пайдалану киберқауіпсіздік және құқықтық өрісті реттеу жөніндегі тиісті шаралармен сүйемелденуге тиіс.

5 Қорытынды

Жалпы, цифрлық технологиялар Қазақстан экономикасын қаржылық болжауға және дамытуға айтарлықтай әсер етеді. Көптеген қаржы институттары мен компаниялары өздерінің бизнес-процестерін оңтайландыру және қызмет сапасын жақсарту үшін жаңа цифрлық шешімдерді белсенді түрде енгізуге тырысады.

Дамудың ең перспективалы бағыттарының бірі болып табылады блокчейн қаржылық транзакциялардың қауіпсіздігі мен ашықтығын қамтамасыз ететін және деректерді басқару процестері мен мәмілелердің тиімділігін арттыра алатын технология. Өзінің артықшылықтарының арқасында блокчейн банк дело, сақтандыру, бағалы қағаздар нарығы және басқаларын қоса алғанда, әртүрлі салаларда қолдану мүмкіндігіне ие.

Цифрлық технологияны енгізу деректер қауіпсіздігіне, қауіпті операцияларға және басқа факторларға байланысты белгілі бір қиындықтар мен проблемаларды тудыруы мүмкін екенін ескеру қажет. Сондықтан барлық ықтимал тәуекелдер мен шектеулерді ескере отырып, цифрлық шешімдерді әзірлеу және енгізу маңызды.

Цифрлық технологиялар Қазақстанның қаржы саласын дамытуда маңызды рөл атқарады. Қаржылық болжау әдістерін жетілдірудің және аналитикалық деректердің сапасын жақсартудың арқасында қаржылық менеджменттің тиімділігін жақсартуға, қаржылық есептіліктің сапасын жақсартуға және қаржылық инвестициялардың тәуекелдерін азайтуға мүмкіндік туды.

Қаржы саласындағы цифрландырудың маңызды құралдарының бірі-үлкен көлемдегі деректерді жинауға, сақтауға және талдауға мүмкіндік беретін Big Data. Бұл құрал бүгінде қаржы ағындарын

болжау, клиенттік базаны талдау, инвестициялық портфельді оңтайландыру және басқа да көптеген міндеттер үшін қолданылады.

Осылайша, Қазақстанның қаржы саласында цифрлық технологияларды пайдалану қабылданатын шешімдердің сапасын жақсартуға, бизнес-процестерді оңтайландыруға және әлемдік аренада отандық компаниялардың бәсекеге қабілеттілігін арттыруға мүмкіндік береді.

Алайда, цифрлық технологияларды енгізу қаржылық және адами ресурстарға айтарлықтай инвестицияларды қажет ететіндігін ескеру қажет. Сондықтан қаржы саласын цифрландыруды табысты іске асыру үшін білікті кадрлардың болуы, сондай-ақ салық жеңілдіктері мен инвестициялық бағдарламалар түрінде мемлекет тарапынан қолдау қажет.

Тұтастай алғанда, цифрлық технологиялар бүгінде Қазақстанның қаржы компаниялары үшін міндетті құрал болып табылмайды, бірақ қазіргі әлемде табысты даму мен бәсекелестік үшін қажеттілік болып табылады.

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The formation of effective methods of managerial decision-making and management in the financial activities of the company

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Abstract

The position of the company in the market and the degree of its use of advanced financial products directly depend on how professionally organized the financial management of the enterprise. The creation of the financial management system involves the development of an arsenal of tools and methods that can improve not only the effectiveness of financial activities, but also the organization as a whole. Therefore, studying the problems of optimizing the system of effective financial management is relevant to any company, especially in its unstable economic conditions. Today, new technologies (digital, telecommunications, biometrics, etc.) have reorganized the financial services industry and are actively replacing traditional players and traditional business models. Integration of new financial solutions will change customer structure, reduce costs for certain functionality (customer processing, etc.), increase efficiency and quality of business processes (target audience targeting, scoring, etc.). This also has a significant impact on sustainability, with the result that the financial technology industry (or fintech) is gradually becoming a rapidly growing industry in its own right. It is a fast-growing new industry that has emerged at the intersection of financial services and new technology sectors. Members of the financial technology industry are developing innovative solutions for user-oriented financial services for a multi-segment market.

Keywords: company financial performance, effective management method, new financial technology, innovative financial products.

JEL codes: G00, G3

1 Introduction

Recently, another technical revolution has taken place in the financial sector, as well as in other spheres of human activity. The transformation of services of the financial segment is associated with the introduction of digital technologies that industrialize processes, reduce costs and meet the demands

of regulators. Company Financial Performance: Companies can measure their financial performance by looking at their financial statements, such as the balance sheet, income statement, and cash flow statement. These statements provide information on the company's assets, liabilities, revenues, expenses, and cash flow. Companies can also use financial ratios to measure their performance, such as return on assets, return on equity, and debt-to-equity ratio. 2. Effective Management Method: Effective management methods involve setting.

ESG (Environmental, Social, and Governance) is a set of standards for a company's operations that focus on environmental protection, social responsibility, and corporate governance. ESG management is the practice of incorporating ESG principles into a company's operations and decision-making processes. This includes assessing the potential environmental, social, and governance impacts of a company's activities, setting goals and targets to reduce negative impacts, and reporting on progress. ESG Fintech refers to the use of technology to promote sustainability and ethical practices in the financial sector. This includes the use of technology to reduce the environmental impact of financial services, promote social responsibility, and ensure good governance. Examples of ESG in Fintech include the use of blockchain technology to increase transparency and reduce the risk of fraud, the use of artificial intelligence to automate processes and reduce costs, and the use of data analytics

The innovative financial and technological system is called FinTech. Today, FinTech is discussed by representatives of credit institutions and commercial companies, central banks of some countries and international economic forums. New technologies in finance are actively implemented in such sectors as banking, stock exchange operations, insurance, money transfers, asset management, etc., However, their implementation is associated with certain difficulties caused by the following factors:

1) the need for innovation;

2) changing customer requirements;

3) increased pressure from regulatory organizations.

Recently, financial and technological digital platforms (one of them is 3DEXPERIENCE by Dassault Systemes, a French company operating in the segment of the financial market) have become very popular.

Innovative methods provide a change in internal banking and customer service. The French company Dassault systemes has developed and is actively implementing the 3D FinTech Challenge in business. It enables rapid innovation and enterprise development in the credit sector.

This program helps new firms learn quickly in a real market environment. In the business environment, organizations interact with both

customers and each other. Under the second concept, business optimization technology firms emerge. They offer them on more attractive terms and at a lower cost than lending institutions. Digitization of processes optimizes costs, makes transactions more transparent and improves the quality of interaction with customers.

Cryptocurrencies were associated with the financial crisis of 2007-2009, which led to the collapse of the classical banking system in almost every country in the world. IT outsiders took advantage of this circumstance and offered disappointed depositors and borrowers new financial instruments – cryptocurrencies [1].

We should also note the heterogeneous composition of users of new financial products. Of course, financial technology startups are the driving force, but traditional companies are also becoming more active. Traditional participants, i.e. companies that do not resort to any changes in financial management, are forced to adapt to the new reality. Today, competition is growing at a faster pace. Therefore, almost all companies have to use new financial technologies as an effective way to manage their financial activities in order to maintain a strong and competitive position in the market. They are investing in modern technology, thereby addressing the changes and actively acting to strengthen their positions.

American technology companies are considered to be the pioneers of financial technology. A large number of innovative projects, developed mainly in Silicon Valley, helped to create a favorable environment for the development of the new industry. However, today other countries, such as the UK, Singapore, South Korea, etc., are becoming centers of financial technology[2].

With advances in technology, the quantum computer will soon become a reality. Government agencies, intelligence agencies, and private corporations are spending billions of dollars each year to develop it. These computers make it possible to crack the cryptographic protection of bitcoins. Therefore, some financial companies have developed their practical settlement money based on the "blockchain" technology behind the creation of bitcoins.

The digital currency is planned to be used without intermediaries, the role of which is played by banks in settlement and clearing transactions and securities transactions. Large credit institutions of many countries are joining this system, which demonstrates the success of the project, which is planned to be realized this year. Mobile

Often financial technology in the digital economy is used along the lines of:

Lending and personal finance - P2P lending, robo-advising (robotic investment advice), financial planning, social trading, algorithmic stock trading in programs and applications, targeted savings services (LendingClub, Kabbage, Robinhood, Etoro, Credit Karma, Binance, E-Loan);

Crowdfunding and business financing (Indiegogo, Kickstarter, Boomstarter, Planeta.ru, StartTrack);

payments and retail transactions: online payment services, online transfer services, P2P currency exchange (transfers between individuals), B2B payment and transfer services (transfers between legal entities), cash registers and smart terminals in the cloud, mass payment services (PayPal, WePay, Alipay, Wechat, Apple Pay, Google Pay, VK Pay, Yandex.Money, Qiwi Wallet);

blockchain and cryptocurrency (Bitcoin, Ethereum, Cardano, EOS, Tron, ChainLink, Tezos);

digital banking (Tinkoff Bank, Monzo, Revolut, Starling Bank, Finicity, N26) ;

banking as baas services (SolarisBank, Mambu, Q2, Bankable, TalkBank) [4].

The most promising digital technologies in the financial sector include:

Artificial Intelligence (AI). Artificial intelligence algorithms can be used to predict the situation in the stock market and analyze the economic situation. AI is used to collect and generate data on what customers often do and helps financial institutions better understand their customers. Another AI-based tool is the chatbots that banks use to provide information support to customers;

BigData-In the financial sector, BigData is often used to predict customer investments and market changes, as well as to shape updated strategies and portfolios.

Big data can also help prevent fraud, help banks allocate marketing strategies and optimize company operations;

Robotic Process Automation is an artificial intelligence technology aimed at automating specific repetitive tasks (such as entering data into information systems) that do not require specialized skills. RPA helps process financial information, such as accounts payable and receivable data, more productively and with fewer errors than manual processing;

blockchain is a distributed database consisting of blocks for recording and storing information. In this case, each block contains a specific type of data about the transaction performed by the user. Blockchain is designed directly for fintech tasks [5].

Modern marketing is a system in which statistics, information processing and feedback are of great importance. With the help of analytical dashboards the user gets more accurate information about the target audience, and innovative services help to form customized offers. Various cutting-edge startups provide banks and companies with state-of-the-art services such as:

1. Insigt & Target-provides financial institutions with a personalized approach to each customer;

2. Optimove-focused on launching test programs and creating micro-segments to reach small teams of potential customers;

3. Uniken-automatically identifies visitors who contact the call center;

4. SaleMove-allows users to stay on the same dashboard when switching from a print chat to an audio or video call

5. Jiffee-allows to use the phone as a payment terminal, thereby reducing the cost of purchasing additional equipment;

6. Nanopay-reduces the risks of cross-border payments and reduces costs for money transfers;

7. Relationshipcip Planner-manager for mobile electronic personnel which helps employees to distribute tasks and estimate their potential;

8.Bpmlline-service for joining senior managers and attracting top clients[6].

2 Results and Discussion

The global market for innovative financial products is one of the fastest growing in the world.According to expert estimates, the number of users of financial products in the world is growing annually by 15-20%, which actively contributes to the growth of Internet access in the world. But the FinTech market is difficult to assess comprehensively due to its strong diversification and unavailability of data in a number of areas. To illustrate, here is the data: to the main segments of the sector (payments and transfers, personal and corporate finance): the total volume of transactions in monetary terms in these segments in 2020 was 5.1 trillion dollars (growth of +24% compared to the level in 2019).

The growth of interest in innovative financial products is explained by the desire of companies to optimize financial management and strengthen their market positions. Thus, there is an increase in investment in new financial technologies and small and medium-sized businesses, the number of transactions of large companies with financial technology manufacturers:

In 2017, the financial group Tinkoff acquired 55% of the shares of the service of online acquiring Cloud Payments, and in 2019 increased its share in the company to 90%. The service allows online payments without switching to a third-party payment gateway and can handle more than 50

currencies worldwide. Cloud Payments can be integrated into any online store and using banking services, including cards of payment systems such as Visa, MasterCard, Mir.

In May 2018, Alfa Bank and Cards Mobile struck an important deal for the financial industry. As a result of the deal between Alfa-Bank and the developer of the mobile application, the first "wallet" cardsmobile received a 25% stake in the company. The amount of investment was not disclosed.

In 2019, "Yandex.Market" acquired convenient services, such as controlling the cost of products ScanToBuy and paying without queuing (a service used in many supermarkets), in the process of buying self-service products ScanToBuy, which allows you to make a list.

The future is for businesses that can integrate their work as possible automated services connected to each other without sacrificing quality. The financial segment of the global market is changing rapidly. Almost all new technologies in the financial sector are focused on B2B success and integration into the new reality of changing B2C payment areas, removing barriers in the transition of the industry to digital technology, implementing new standards of electronic technology through payments, business optimization, reducing costs through automation, reducing the burden on employees, electronic assistants, the individualization of goods and works.

3 Conclusion

It follows that in today's era of progressive globalization, the market is not standing still, but moving forward. New financial technologies are gaining momentum in various areas. Today, large Internet corporations, telecommunications companies, retailers, automakers, and manufacturers of various products use a variety of financial technologies and the latest developments to improve the efficiency of their financial management and expand their customer base by entering into agreements with manufacturers of innovative products. All branches of economy efficiently use various advanced technologies and positive results of scientific progress to meet modern requirements. Innovative financial technologies are especially widespread in the financial market. Therefore, in order to remain competitive and firmly hold their position in the market, companies must use new financial technologies as an effective way to manage their financial activities.

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Economical Dynamic. Marketing.

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Abstract

For any business, one of the most important issues is to determine the volume of future sales. This work is devoted to this topic. The approach to solve it is taken by analogy with analytical mechanics: we will consider the commodity market as a dynamic system, the driving forces in which are the marketing strategies of market participants. The main result of this work is the *Basic Equation of Economic Dynamics*. The resulting equation will allow businesses to properly plan and manage their sales, understanding the dynamic dependence of their marketing activities and the results of these actions.

Keywords: Applied Mathematics, Modeling, Economics, Marketing.
JEL codes:

1 Introduction

A good Marketer knows the marketing tools that increase sales; knows how, where and which one to use. Having reached certain heights, he begins to think about how to reach the next stage of development and do his work more consciously and prudently. Not just experiment with different types of marketing and then analyze their results; but to figure out exactly which marketing activities lead to which results even before you conduct them. If we are talking about calculations, then (Higher) Mathematics is indispensable. To solve this problem, this Marketer will be helped by the *Basic Equation of Economic Dynamics (BEED)*:

$$\frac{\frac{d}{dt}X(t)}{X(t)} = F(\text{Marketing Expenses})$$

where $X(t)$ is the volume of sales, F is a function depending on marketing activities.

The expression $\frac{\frac{d}{dt}X(t)}{X(t)}$ is the sales growth rate. Therefore, *BEED* talks about how the rate of sales growth depends on marketing activities.

2 Literature review

The defining of sales in the world of business and economic analytics is, if not the most discussed and studied, then one of the main ones in economic science. However, today there is not a single universally recognized theory that entrepreneurs would follow. The very presentation of all the results made in this area can be a separate work, which is also quite a lot. The presented article does not contain any ideas of other authors, on the basis of which the results were obtained.

Attempts to create a mathematical model of the Economy and its individual fragments have been made many times, but to this day there is not one of them that can be considered successful with confidence.

Roughly, these attempts can be divided into two main approaches: using the apparatus of *Mathematical Statistics* and using *Game Theory*.

The first approach is based on the fact that economic phenomena are accepted as random processes. Therefore, a description is given of the dynamics of such economic indicators as – the cost of goods, shares, etc.; cash flow generated by the business and much more by the stochastic process formula.

For example.

$dS = B\,dt + C\,dW$, where S is the cost of goods or assets, t is the time, W is the Wiener process (Brownian motion process), B and C are the characteristic functions of the process.

The second approach is based on the *Theory of Games*, which originated in the early twentieth century as a mathematical model of gambling. In short, it consists in the fact that there are N participants (players), each of which has an objective function F_i (payoff) $i = 1, \dots, N$, which they seek to maximize. At the same time, the participants have a choice of certain behavioral strategies $\sigma_j, j = 1, \dots, N$, on which the values of the objective functions $F_i = F_i(\sigma_1, \dots, \sigma_N)$ depend.

The first model is 213nsuccesssful in that it ignores the fact that a person is able to analyze the past, make a planning for the future and, in accordance with this, correct his behavior in the present. The random process model is suitable for such phenomena as the spread of viruses and infections, corrosion of metals, and the like; but where there is human participation, it is hardly applicable. The only place where this model has “taken root” is actuarial mathematics, which takes into account the statistics of deaths, accidents, traffic accidents, etc. for calculating premiums and costs for pension and insurance payments.

The second model assumes a conscious choice of behavior by the participants in the process. Within the framework of Game Theory, it is

accepted that the behavior of a participant in economic relations is dictated by the maximization of its objective function, and the usefulness and uselessness of such behavior and the chosen objective function are beyond mathematics.

But game theorists who create such economic theories misunderstand the motivations of market participants and the benchmarks on which they rely. They do not use such tools of financial analysis as profitability, turnover, liquidity and stability, which modern business breathes. Also, such models are usually considered as static systems without taking into account the dynamics of changes and the influence of past actions.

Generally, theories of economics are created as people who come from an entrepreneurial environment, i.e. “practitioners” and people who came from science, i.e. “theorists”.

Practitioners come from their experience, but they lack scientific capacity and methodology. Therefore, their works of Financial Analysis and Project Analysis use an apparatus that, from the point of view of modern mathematics, is no more complicated than arithmetic. In turn, theorists, when constructing their theories, poorly understand the processes of management, i.e. how decisions are made, what key parameters (other than profit) are important when making these decisions, etc. Therefore, the theories of theorists are too abstract and out of touch with reality. A symbiosis of practice and theory is needed.

3 Methodology

For a correct analysis, it is necessary to solve a methodological problem: to determine what is the starting point, what processes need to be considered, what they are; and also, to determine what hardware solutions to solve these problems.

It is necessary to understand the practice of business and how the business lives, i.e. laws of incentive and motivation, financial and project analysis, organization of the production process, logistics, marketing, financial reporting, etc., but at the same time be able to use the gigantic mathematical apparatus that already exists, such disciplines as the theory of differential and variational calculus, the theory of functional analysis, tensor analysis, optimal control theory, etc.

The Basic Equation of Economic Dynamics based on the fact that the system under consideration is a dynamic system, by analogy with analytical mechanics, answers the question Why Sales occur (movement), which is the driving force behind sales.

Usually speaking about the volumes of future sales, all analysts talk about forecasts of these volumes. In other words, the determination of future

sales volumes is based on stochastic, probabilistic models. However, probability theory as an analysis tool is used when there is a large uncertainty factor, when it is not possible to calculate all or at least the main factors affecting the result. In the case of Goods Market, these factors can be determined in most cases. In a world where information on many things is available, you can find all the data on all major market operators: their sales volumes, used tools of marketing activities and costs of them and more. For this reason, dynamic analysis and calculation of future sales volumes will give a much better result in comparison with stochastic models.

4 Results and Discussion

Let us show why a formula which describes future sales exists. As an example, let's simulate a sales market in a Shopping Center.

A person who enters the Shopping Center, mentally, somewhere in the subconscious, has already spent a certain amount of money just by entering the shopping center. Otherwise, why did he decide to go there? At the same time, this amount is quite certain, say 5,000 tenge. That is, a person will not leave the mall until he spends them, and most likely he will not spend more than these 5,000. There are cases when a person goes with a specific goal to buy this or that thing, but mostly people go to the mall without a specific goal. More precisely, this goal is simply to spend 5,000 tenge.

So, the mall is visited by, say, 10,000 people a day with an average budget of 5,000 tenge for all sorts of purchases. We get that the total intention to spend the money of all buyers per day in the mall is 50 million tenge. Now the question arises: how will this money be distributed among the sellers located in the mall? And this is where Marketing begins. Marketers enter the arena with their marketing tools to influence the buyer. The better the work of a marketer, the higher the sales, the more a piece of 50 million tenge will be received by the company where this marketer works. In other words, the share of the seller in the total basket of 50 million tenge depends on the marketing activities carried out by the seller. A struggle begins between sellers for the buyer, for his loyalty, for his preferences. And this struggle translates into costs that all companies bear for attracting customers.

Companies make discounts, i.e. receive an expense in the form of lost income. Companies located in a more advantageous location in the mall have a marketing advantage; however, the owners of the shopping center, knowing this, take higher rents from them, i.e. you have to pay for this advantage. In other words, any marketing requires costs.

This fact correlates with the fact that nothing happens by itself, and if you want to get some kind of result (sales of goods), then you need to make an effort for this. All of these efforts come at a cost.

Let's sum up all marketing expenses of all companies located in the mall. Let's assume that this amount was 5 million tenge, i.e. 10% of all sales. At the same time, it is logical to assume that companies invest in marketing in proportion to their market share. That is, if a company occupies 10% of the market (10% * 50 million = 5 million), then it invests 10% of the total amount of all marketing expenses of all companies in marketing (10% * 5 million = 0.5 million). Indeed, companies monitor the behavior of competitors and therefore the arsenal of marketing tools for all companies is the same. Therefore, the efficiency of their investments in these marketing tools should be the same.

If the company decides to increase its market share, then it must invest more in marketing to achieve its goal.

Let's take a certain company in the mall. Let's denote its market share as λ. Then, in order to be at this level of sales, this company must invest in marketing an amount equal to $\lambda \cdot I$, where I is the sum of all investments in marketing of all companies, i.e. $I = 5$ million tenge. Now, if a company decides to increase its market share by $d\lambda$ over a period of time dt, i.e. to the level $\lambda + d\lambda$, then it must invest more than $\lambda \cdot I$ in marketing. Moreover, this "extra" payment must be proportional to the "jump" $d\lambda$. Denote by inv the investment in the marketing of this company. Then

$$inv = \lambda \cdot I + d\lambda \cdot M(dt)$$

where the multiplier $M(dt)$ is the "price" for a 1% jump over time dt. If we now assume that the "price" of the jump per unit of time is M, then $M(dt) = M/dt$. Then the final formula will take the form:

$$inv = \lambda \cdot I + \frac{d\lambda}{dt} \cdot M$$

This is the *Basic Equation of Economic Dynamics*, which gives the mathematical functional dependence of market share and investment in marketing. This equation is true for all mall companies.

Let $X^i(t)$ be the sales volume of company i at time t. Let us denote the total volume of the market as $X^{\text{total}}(t)$. Then the market share of this company, which we denote by $\lambda^i(t)$, will be equal to:

$$\lambda^i(t) = \frac{X^i(t)}{X^{\text{total}}(t)}.$$

Then *BEED* could be written as

$$inv^i(t) = \lambda^i(t) inv(t) + M \frac{d}{dt} \lambda^i(t).$$

And in terms of volume of sales it will be

$$inv^i(t) - \frac{X^i(t)}{X^{\text{total}}(t)} inv(t) = M \frac{d}{dt} \frac{X^i(t)}{X^{\text{total}}(t)}.$$

Let us now carry out a series of transformations: multiply both sides by $\frac{1}{M}\frac{X^{\text{total}}(t)}{X^i(t)}$, then

$$\frac{X^{\text{total}}(t)}{X^i(t)}\frac{inv^i(t)}{M} - \frac{inv(t)}{M} = \frac{X^{\text{total}}(t)}{X^i(t)}\frac{d}{dt}\frac{X^i(t)}{X^{\text{total}}(t)(t)} = \frac{\frac{d}{dt}X^i(t)}{X^i(t)} - \frac{\frac{d}{dt}X^{\text{total}}(t)}{X^{\text{total}}(t)}.$$

Now, if we rearrange the terms, we get:

$$\frac{\frac{d}{dt}X^i(t)}{X^i(t)} - \frac{X^{\text{total}}(t)}{X^i(t)}\frac{inv^i(t)}{M} = \frac{\frac{d}{dt}X^{\text{total}}(t)}{X^{\text{total}}(t)} - \frac{inv(t)}{M}.$$

In the last equality, the right side does not depend on the volume of sales of the company, i.e. it is the same for all companies.

Now note that the expression $\frac{\frac{d}{dt}X^i(t)}{X^i(t)}$ is the rate of sales growth. The expression $\frac{X^{\text{total}}(t)}{X^i(t)}$ is the reciprocal of the company's market share, and what we previously called "investment" in sales $inv^i(t)$ in the language of accounting is called implementation costs.

Thus, we have obtained the dependence of the sales growth rate on the company's market share and implementation costs.

However, it should be noted that $inv^i(t) \neq$ implementation costs. This is because different marketing tools have different effectiveness.

The result of the sales expenses incurred should be a change in sales volume, but 1 tenge invested, say, in advertising and 1 tenge used as a discount for the client, will give a different effect on sales volume. However, in accounting they are equal.

Let the company allocate a certain budget for the costs of promoting the product, which consists of various types of costs:

$Budget = Expense_1 + \cdots + Expense_n$.

Then, investment in sales is a function of these costs:

$inv^i(t) = f(Expense_1; \dots; Expense_n)$.

In management accounting, expenses are recorded in relation to the required revenue, i.e. sales volume $X^i(t)$:

$\sigma_{\text{Ex }1} = \frac{Expense_1}{X^i(t)}, \dots, \sigma_{\text{Ex n}} = \frac{Expense_n}{X^i(t)}$

Therefore, one can write that

$inv^i(t) = f\left(\sigma_{\text{Ex }1}X^i(t); \dots; \sigma_{\text{Ex n}}X^i(t)\right)$.

or

$inv^i(t) = f\left(\sigma_{\text{Ex }1}; \dots; \sigma_{\text{Ex n}}; X^i(t)\right)$.

In some cases, "scaling" is not definitive, i.e. there is proportionality

$inv^i(t) = f(\sigma_{\text{Ex }1}; \dots; \sigma_{\text{Ex n}})X^i(t)$.

$\frac{inv^i(t)}{X^i(t)} = f(\sigma_{\mathrm{E}x\ 1}; \dots; \sigma_{\mathrm{E}x\ \mathrm{n}})$.

Here we can recall the Pareto principle (20/80): 20% of the effort brings 80% of the result. Since the vector $\boldsymbol{\sigma}^i(t) = (\sigma_{\mathrm{E}x\ 1}; \dots; \sigma_{\mathrm{E}x\ \mathrm{n}})$ indicates the "efforts" of the enterprise applied to the market to promote its products, these efforts give different results. But as the principle itself says, all efforts are necessary regardless of their contribution, otherwise there is a redistribution of the effectiveness of the contribution that preserves the ratio of 20/80.

Moreover, if we take into account the 4P marketing theory (Product, Price, Promotion, Place), then the list of expenses and, accordingly, the arguments of the function $inv^i(t)$ must include the cost of production, which reflects the Product factor. The Promotion factors are promotion costs and the Place factors are distribution costs. The Price factor can be viewed as an expense Discount. This means that there is a certain average price level and all enterprises, focusing on this level, set their prices in the form of a discount / markup from it.

Returning to the *BEED*, we see that it will take the form:

$\frac{\frac{d}{dt}X^i(t)}{X^i(t)} - \frac{X^{\mathrm{total}}(t)}{M} f(\boldsymbol{\sigma}^i) = \frac{\frac{d}{dt}X^{\mathrm{total}}(t)}{X^{\mathrm{total}}(t)} - \frac{inv(t)}{M}$.

It should be noted that, generally speaking, the vector $\boldsymbol{\sigma}^i$ will include not only direct costs, but also the so-called indirect costs of the company, such as costs associated with ensuring the turnover of assets / liabilities (receivables and payables, goods, fixed assets, etc.), other expenses.

It should also be noted that the sales volume of the company and depends not only on its parameters $\boldsymbol{\sigma}^i$, but also on similar parameters of competitors. Because the $inv^i(t) = f(\boldsymbol{\sigma}^i)X^i(t)$ and $inv(t) = \sum_j inv^j(t) = \sum_j f(\boldsymbol{\sigma}^j)X^i(t)$ then

$\frac{\frac{d}{dt}X^i(t)}{X^i(t)} - \frac{X^{\mathrm{total}}(t)}{M} f(\boldsymbol{\sigma}^i) = \frac{\frac{d}{dt}X^{\mathrm{total}}(t)}{X^{\mathrm{total}}(t)} - \frac{X^{\mathrm{total}}(t)}{M} \sum_j f(\boldsymbol{\sigma}^j) \frac{X^i(t)}{X^{\mathrm{total}}(t)}$.

It is difficult, if not impossible, to derive these *market functions* $f(\boldsymbol{\sigma}^i)$ analytically. They can be obtained empirically by tracking the statistics of the behavior of enterprises and the population in a particular market. And we theoretically obtained that the search should be conducted in a differential, dynamic, deterministic form.

Here it is appropriate to recall that, almost all formulas in physics, such as spring force, friction force, Coulomb's law, Maxwell's laws, etc. were obtained empirically. For this reason, the next step in determining BEED should be research based on dates of existing markets.

At the same time, in order to correctly determine the parameters on which market functions will depend, it is necessary to use accounting and

financial analysis coefficients, such as sales profitability, turnover of goods and other current assets, growth rates of sales, production and stocks, and much more. This will require a deeper dive into the world of financial and accounting reporting. Moreover, it is necessary to translate financial flows and data of accounting postings into the language of dynamic systems using all the means of modern Mathematics.

5 Conclusion

Now, if we assume that we were able to correctly define *BEED* and solve it with respect to $X^i(t)$ (integrate the equation), i.e. were able to determine the value of $X^i(t)$ depending on the volume of marketing activities; then we can EXACTLY calculate the value of the company's future sales volumes. To many people, this will seem impossible. But …

A plane made of iron and weighing several tons flies in the air and does not fall. This once also seemed unbelievable to people, but it became possible. It became possible after people studied the laws of aerodynamics and learned how to calculate the trajectory of an aircraft. Now this is no longer considered incredible, and the fact that the pilot confidently leads his liner along a pre-calculated trajectory seems obvious and simple.

The same is true with marketing. By learning the laws of marketing and learning how to solve the marketing equations, companies, like pilots, can manage their sales volumes. At the same time, we are not talking about sales forecasts, but about how to accurately calculate these volumes. Continuing the analogy with aviation, pilots fly not along forecast routes, but along the trajectory that they calculated in advance.

In fact, very often the most improbable turns into the possible. And this transformation helps to realize Mathematics.

The Basic Equation of Economic Dynamics applies to all commodity markets. However, this equation is different for each market. To determine this equation for a specific market, a specific business, it is necessary to conduct research using the modern apparatus of Advanced Mathematics.

In conclusion, it must be said that the presented work is not completed, but rather is the beginning of many future studies both in the field of Microeconomics of companies and in the field of Macroeconomics, commodity market analysis, and behavioral analysis, etc.

The author of this article plans to continue working in this direction.

Государственное регулирование научных организаций: краткий обзор с начала независимости и по настоящее время.

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Аннотация

За государством закрепляется роль стабилизатора, который будет укреплять научную деятельность организации, как внутри страны, так и на мировой арене. Адаптировать положение науки в стране к его изменяющимся условиям. В статье приведен краткий обзор государственного регулирования науки и научных организаций с момента обретения независимости по настоящее время, путем перестройки государственных органов, открытия новых научных организаций, принятий нормативно-правовых актов, регулирующих научную деятельность. Методы применения мирового опыта в науке Казахстана, как происходит внедрение, инструменты и механизмы, регулирующие работу государства. Методы исследования применимые в работе — это количественный анализ публикаций ученых и специалистов, а также применение метода историзма, для установления закономерного развития и изменения во времени роли государственной политики в науке. Сделан вывод о том, на какой стадии развития находится современная казахстанская наука, что было сделано за годы независимости. В конце статьи указаны методы внедрения новой модели развития науки, какие условия можно создать для преобразования научных организаций.

Ключевые слова: Государственное регулирование, наука, Национальная академия наук, научно-исследовательские институты

JEL codes: H83, Z18

Основная часть

Под термином государственное регулирование научных организаций подразумевается система мер, форм и методов, с помощью которых государство и созданные им органы осуществляют управленческую деятельность, а именно законодательного, исполнительного и контролирующего характера.

После развала Советского союза страна погрузилась в социально-экономический кризис, науку это тоже не обошло. Казахстанская наука, в начале своей независимости, в как и во всех постсоветских республиках, испытывала сложные времена. Научные возможности и потенциал которые были еще созданы в советское время, в начале 90-х годов начинает свой спад, из-за ряда острых проблем. Результативность науки начала резко сокращаться, главной сложностью было маленькое, а иногда и вовсе отсутствие финансирования. Спрос на научные исследования, и их результаты, оказались и вовсе не нужны, сокращение результативности науки, привело к огромной текучести рабочих кадров. Данные обстоятельства, плюс устаревшая материально-техническая база и низкие условия проведения научно-технических исследований, а также стареющие научные кадры, приводят к закрытию многих научных институтов, а в начале 90-х в Республике их было около 300 научных организаций. Все вышеуказанные обстоятельства конечно привели к сокращению результативности науки, число научных умов в стране сократилось почти в два раза, многие институты начали закрываться, а оставшиеся держались из последних сил, и сотрудники бывало ждали заработные платы по несколько месяцев.

В эти годы была острая необходимость предпринимать шаги для налаживания организации работы научных организаций, науки в целом и нормативной базы в сфере науки. В основе регулятора обеспечения жизнедеятельности науки и научных организаций в стране в 1992 г. был принят закон «О науке и государственной научно-технической политике Республики Казахстан». Данный закон должен быль определить понятия, взгляды и принципы для развития науки в новый период для страны, которая только недавно стало самостоятельной.

С 1992 г. началось преобразование полностью системы образования и науки. Центральным исполнительным органом для выполнения главной задачи, а именно руководства всей научной-технической политикой страны становиться Министерство науки и новых технологий. Кроме этого, в республике начинают создаваться различные органы и структуры которые наряду с министерством, будут определять политику НИОКР (научно-исследовательские и опытно-конструкторские работы) страны, подготовкой научных кадров, и т.д. В 1993 г. была принята Республиканская целевая - программа «Развитие государственной системы научно-технической информации Республики Казахстан».

Подготовка кадров и специалистов для приоритетных секторов экономики страны были главной целью для начала развития науки в новой стране, и в ноябре 1993 г. была учреждена международная

стипендия «Болашак». Ее программа включает в себя академическое обучение (магистратура, докторантура), а также научные стажировки в лучших компаниях и университетах мира (1).

В 1996 Министерство науки и новых технологий было соединено с Национальной академий наук (далее – НАН), и стали исполнительным органом, обеспечивающим государственное управление в сфере науки и техники и начало носить название - Министерство науки — Национальная Академия наук РК. Однако данное преобразование, не оправдало себя, и уже через три года, в республике появилось Министерство образования и науки, НАН ждало не только выведение из состава исполнительного органа, а еще и реформа. С Академии наук был снят статус государственной организации, и предан статус общественной, выведение из ее состава академических институтов. Некоторые институты перешли в отраслевую ведомственность, другие были объединены с ВУЗами.

Реформа НАН вызвали противоречивую реакцию, как и среди ученого мира страны, так и среди общественного. Многие ученые приняли эту новость ужасающей, так как эта новость привела к потере авторитета Академии наук не только в республике, но и в мире. Переход в общественную организацию, показывало недоверие или потерю его, со стороны Президента и Правительства, а перенос некоторых научных организаций в Астану, столицу уже на тот момент страны, для интеграции со столичными университетами, только подтверждают такие мнения. Нашлись и сторонники этой новости, которые видели неудачную работу объединенного министерства и НАН, и давно хотели, чтобы казахстанская наука, перешла на коммерческую основу.

Согласно уже Уставу общественного объединения Академия наук целью деятельности Академии является всемерное содействие развитию науки в Казахстане, реализации наиболее важных и перспективных научных исследований и научно-технических разработок, внедрению результатов научно-технической деятельности в экономику страны, развитию научно-инновационной деятельности, профессиональной консолидации ученых Казахстана (2).

В 2006 г. ключевым моментом в реформе государственного регулирования науки, является создание единого администратора реформ в структуре Министерства - Комитета науки. А также создание акционерного общества со 100% участием государства для регулирования и контроля опытно-конструкторских работ, а в последующем и проектов коммерциализации «Фонд науки».

Одной из главной детали для интеграции в мировое научное сообщество должно стать развитие научно-технологического

пространства. В республике внедряются такие стандарты как системы сертификации, авторские права и права об интеллектуальной собственности. Всю свою деятельность ученое сообщество строит на общемировой практике, подводя их к международным критериям. Как показало время, мир не стоит на месте, появляются все больше новых технологий, нашим ученым бросают вызов такие виды как автоматизация производства, искусственный интеллект, энергосберегающие технологии и ядерная энергетика. Начинается процесс международного обменами между учеными и специалистами, инновационный процесс становится непрерывным. Наши ученые понимают, что перенимая чужой опыт, в первую очередь необходимо развивать собственную науку и научно-технологические направления (3).

Для начала становления новой ступени развития науки в стране требуется развитие научно-исследовательской инфраструктуры. В Казахстане принимается Закон «Об инновационной деятельности» ответственным органом становиться Министерство образования и науки. Взяв на вооружение мировой опыт, на плечи министерства ложится реализация всех научных проектов и программ, подготовка научных кадров, проведение государственной экспертизы (4).

В 2000-е годы для совершенствования системы управления и модернизации научно-технической сферы и инфраструктуры, а также подготовка высококвалифицированных научных кадров, увеличение объемов финансирования НИОКР, в том числе путем привлечения частных инвестиции была принята «Государственная программа развития науки Республики Казахстан на 2007-2012 годы».

В 2011 году при Правительстве Республики была создана Высшая научно-техническая комиссия (далее - ВНТК), основными задачами которой являются формирование стратегических задач и приоритетов, направленных на развитие научной, научно-технической и инновационной деятельности, а также определение приоритетных фундаментальных и прикладных исследований по направлениям науки.

Состав такого коллегиального органа состоит из членов Правительства, руководителей государственных органов, ведущих ученых, представителей национальных холдингов и компаний и т.д. Такой состав показывает, что на данном органе лежит очень большая ответственность, то есть вектор и направление которую берет страна в области науки определяют они. Рабочим органом же является Комитет науки (5).

В 2011 г. в стране решают применить мировой опыт, который так необходим в нынешнем положении дел в науке, и принимают новый

Закон «О науке». Главным преобразованием было открытие АО «Национальный центр государственной научно-технической экспертизы» (далее – НЦГНТЭ), в котором государственное участие будет 100%. Именно НЦГНТЭ, с того момента и по сей день, выпала доля организации, в компетенцию которой входит многоуровневая государственная научно-техническая экспертиза (далее – ГНТЭ), куда будут привлечены зарубежные эксперты, для экспертизы научных, научно-технических проектов и программ, а в последующем и проектов коммерциализации. Помимо этого, НЦГНТЭ будет рабочим органом Национальных научных советов (далее – ННС), коллегиального органа, которые и будут принимать главное решение по финансированию проектов и программ. Состав ННС состоит из числа действующих казахстанских ученых, по одному зарубежному ученому в каждый совет, а также представителей госорганов, национальных холдингов и компаний.

По каждому из принятых решений в 2011 г., т.е. по НЦГНТЭ, ННС и ГНТЭ, помимо внесений изменений в Закон «О науке», были приняты отдельные нормативно-правовые акты в виде постановлений, в которые практически каждые два года вносятся корректировки. О работе и компетентности данных органов вопросов ежегодно задается огромное количество, однако стоит сказать, что уполномоченный орган науки, коим является Комитета науки, постоянно реагирует и прислушивается к мнению ученых об улучшении работы вышеназванных. Комитет науки является государственным органом, осуществляющим функции по реализации государственной политики в сфере науки, в пределах компетенции Министерства образования и науки, а также уполномоченным органом осуществляющим межотраслевую координацию в области науки и научно-технической деятельности.

Этим самым научно-исследовательские институты конкурсным отбором, на основе экспертизы, и решений ННС, помимо базового финансирования, которое выделяется научным организациям (а каким именно, указано в Постановлении Правительства № 575 от 25 мая 2011 г.), могут рассчитывать в случае удачного проекта и программы, на грантовое и программно-целевое финансирование. Базовое финансирование научных организаций, оставляет желать лучшего, поэтому участие в конкурсах на финансирование является главной приоритетной задачей научно-исследовательских институтов.

2011 год стал-таки переломным годом для научных организации страны, да и для науки в целом. Принятые нормативно-правовые акты, законодательно установили роль и участие государства в развитии науки, и контролем за научными организациями.

Помимо вышеперечисленного в новом законе должны были произойти изменения в вузовской науке, и интеграции науки в реальном секторе экономики. Эта интеграция нашла свое продолжение в 2015 году, и принятом Законе РК «О коммерциализации результатов научной и (или) научно-технической деятельности», научные исследования теперь должны были получать свою реализацию на практике и внедрятся в производство.

С 2019 г. государством увеличивается число конкурсов, которые являются основным источником оплаты труда научных сотрудников. Несмотря на пандемию коронавирусной инфекции, впервые в стране проходит конкурс молодых ученых. В целом государство понимая, что научные организации, в основном зависящие от грантового и программно-целевого финансирования, нуждаются в его поддержке, и конкурсы, которые проводились раз в три года, будут теперь проводиться ежегодно.

Главной и актуальной задачей страны является развитие науки и ее эффективность. Президент Республики К.К. Токаев ежегодно в послании народу Казахстана, на встречах, когда поднимается вопрос науки, поручает существенно увеличивать финансирование науки, и довести к 2025 ее до 1% от ВВП.

Базовое финансирование, к которому приходится возвращаться, является основным источником дохода НИИ, так как в конкурсах бывают, как и победители, так и проигравшие. И зачастую бывает так, что некоторые НИИ получают за конкурс до 10 проектов, а кто-то и ни одного. Вот эта если можно даже выразиться «ахиллесова пята» науки, а точнее ее финансирования, нуждается в реформе. Недавние изменения связанные с включением внесения научных сотрудников в перечень базового финансирования НИИ, которые проводят фундаментальные, стратегические для страны исследования. Однако, есть еще много вопросов которые необходимы для решения, такие как разработка системы надбавок ученым, открытые конкурсы при назначении руководителя НИИ и др.

Заметно, что национальная поддержка науки за время независимости была ориентирована на отечественных ученых, стимулирование их к исследовательской работе. Сдвиг в научной сфере республики заметен, за последнее десятилетие увеличилось количество научных сотрудников от 15 до 22 тысячи человек, и что самое главное достижение — это привлечение молодых ученых, которое составляет уже 40% от общего числа ученых занятых в науке.

Публикационная активность, еще одна проблема казахстанских ученых, которые в конце 90-х и начала 2000-х массово начали писать

научные статьи во все журналы входящие и не входящие в международные базы данных, что только испортило имидж казахстанской науки, которая по статистическим данным в основном публиковалась в «хищнических» журналах. «Хищнические» или мусорные журналы, как их называют в ученой среде, это те журналы, которые взимают плату с авторов, за публикацию в своих журналов, которые даже не несут за собой статус научного журнала. Однако, вмешательство контроля в НИИ и ВУЗах, и доступу к международным базам данных Scopus и Web of Science, заставило изменить подход ученых к публикационной деятельности. За последнее десятилетие это позволило нашей республике «снять» с себя ярлык хищнических публикаторов, до авторов в мировых зарубежных журналах, и занять 75-е место в мировом рейтинге из 214 стран.

Конечно, нельзя отметить, заслугу нашего государства в борьбе с мировой проблемой, которая обрушилась на нашу страну в 2020 году – пандемией коронавирусной инфекции SARS-CoV-2 (далее - COVID-19). Разработка собственной вакцины, вывела ученых из Научно-исследовательского института проблем биологической безопасности на мировой уровень, и показала, что наука страны несмотря на многие проблемы, с которыми столкнулась в своем зарождении, выбрала правильный путь.

Еще одним переломным моментом в развитии науки и научных организаций, стала 75-летняя юбилейная сессия НАН РК, на которую были приглашены президент Республики Казахстан, многие члены правительства, президенты и их представители академии наук России, Турции, Узбекистана, Таджикистана и др. На данной сессии президент отметил, что для увеличения потенциала и достижения прогресса необходимо ставить перед собой высокие цели. В нынешнее время сила и мощь государства, его авторитет на международной арене измеряются научно-техническими достижениями. За неделю до этого Президентом была принята Концепция развития науки до 2026 г. В Концепции отмечен анализ текущего состояния казахстанской науки, кадровый и научный потенциал, видение развития науки, научная инфраструктура, главные цели и ожидаемые результаты. Глава государства также поручил Правительству и профильным министерствам запустить программу поддержки научно-технологических парков при вузах с выделением целевых грантов на развитие научных лабораторий и опытно-испытательной инфраструктуры (6).

Ну, а главным преобразованиями должно было стать возвращение государственного статуса НАН РК, и разделение Министерства образования и науки на два отдельных профильных министерств –

Министерство просвещения и Министерство высшего образования и науки (далее – МНВО).

Уже в течение нескольких недель Министерство образования и науки было реорганизовано, а вот вопрос о статусе НАН РК, занял более длительно время. Лишь в начале 2023 г. НАН РК был дан статус некоммерческого акционерного общества (далее – НАО), которое тоже ученые встретили противоречиво, некоторые сказали, что данный статус намного лучше государственного учреждения (далее – ГУ), намекая что у НАО полномочия более шире, чем у ГУ. Другие ученые остались при своем старом мнении, о том, что, изменений никаких не будет, просто теперь постоянное государственное финансирование, и главным приоритетом будет коммерческая выгода, а не наука. 27 марта 2023 г. вышел Указ Президента РК о повышении статуса НАН РК, и теперь организация будет носить название «НАН РК при Президенте РК».

Вопросов по НАН РК очень много, ответов же, как и ученый мир, так и общество пока не получило. Главным вопросом является, в чем будет заключены функции и положения у НАН РК, кому будут подчинены научно-исследовательские институты, и много других.

Исходя из преобразований которая претерпевает наука страны, развитие науки, техники и инноваций является одним из ключевых направлений повышения конкурентоспособности страны. В новой реальности для технологической модернизации экономики необходима перезагрузка модели науки.

На данном этапе вопрос определения ключевого партнера государства в научном сообществе является стратегическим. В связи с этим, необходимо продолжить работу по усилению роли НАН РК в развитии научной сферы Республики Казахстан и институциональному преобразованию формы собственности академии. Это структура должна стать центром научной мысли и авторитетной структурой, осуществляющей экспертную деятельность.

Без кардинальной перезагрузки казахстанской науке невозможно достичь поставленных целей – по росту финансирования до 1% от ВВП, частных инвестиций, обновлению научных кадров и оборудования. С учетом важности научно-технологического прогресса для развития нашей страны будет разработан новый Закон Республики Казахстан «О науке и технологической политике», который будет способствовать тесному диалогу между наукой и бизнес-сообществом в целях вовлечения наукоемких исследований в производственные сектора экономики страны.

В целях совершенствования системы реализации государственной политики в области науки и научно-технической деятельности создан

Национальный совет по науке и технологиям (далее – Совет), основной задачей которого будет определение приоритетов национальной научно-технологической политики, механизмов развития, экспертная оценка текущего состояния.

Как показывает опыт других стран, работа Совета будет способствовать не только авторитету и качеству национальной науки, но и обеспечит тесный контакт с ведущими учеными мира, приток компетенций для перезагрузки и развития науки.

Совершенствуются процессы присуждения степеней доктора философии (PhD) и доктора по профилю, присвоения ученых званий ассоциированного профессора и профессора.

В целях активного вовлечения частного сектора и национальных компаний в создание научной инфраструктуры на базе филиалов АО «НЦГНТЭ» для осуществления консалтинговых, сервисных, организационных услуг открыть региональные центры «Ғылым үйі». Их деятельность будет направлена на формирование и развитие научно-технологических компетенций и повышение компетенций в области коммерциализации, что позволит научным работникам, представителям бизнеса, другим желающим в регионах улучшить профессиональные навыки.

Выводы

Для определения перспективных научно-технических задач науки надо осуществлять форсайт (Foresight) исследования в сфере развития науки. В рамках этих исследований и будут выявлены основные приоритетные научные и технологические направления научной и инновационной политики развития страны. Итоги форсайтных исследований будут учитываться при формировании государственной научно-технической политики, политик и стратегий всех государственных органов, ответственных за координацию научно-технической и инновационной деятельности.

Для интеграции в мировое научно-технологическое сообщество обеспечить доступ к международным базам данных в рамках национальной подписки. Это будет способствовать увеличению количества статей и обзоров казахстанских ученых в высокорейтинговых изданиях Q1, Q2 Journal Citation Reports JCR, что позволит повысить качество и эффективность публикационной активности.

Для дальнейшего повышения экономической эффективности есть необходимость принять меры по операторству грантового финансирования.

В целях совершенствования государственной научно-технической экспертизы научных проектов и программ внедрить механизм рандомизации отбора экспертов и другие меры.

В целях повышения эффективности и оперативности принятия решений внедрить обновленную модель работы ВНТК.

Обновление составов национальных научных советов в соответствии с приоритетами развития науки должно повысить прозрачность и транспарентность.

На основании межправительственных соглашений по научно-технологической деятельности проработать вопросы реализации научных проектов и программ в рамках международной коллаборации.

Для усиления роли уполномоченного органа в области науки и высшего/послевузовского образования необходимо принимать меры по увеличению доли представителей МНВО в Совете директоров (наблюдательный совет) НИИ и вузов отраслевых государственных органов. Кандидатуры проректоров, директоров НИИ и программа развития НИИ и Вузов отраслевых государственных органов необходимо согласовываться с уполномоченным органом в области высшего образования и науки.

В целях вовлечения в научно-исследовательскую деятельность регионов будут необходимо принимать меры по реализации научных исследований для решения ключевых проблем экономики регионов, в том числе предусмотрев соответствующее финансирование из местного бюджета.

Для наращивания кадрового потенциала и формирования критической массы ученых нужно продолжать внедрение корпоративного управления, гибкой системы финансирования и управленческой самостоятельности, путем поддержки молодых ученых.

Необходимо проводить модернизацию научной инфраструктуры и цифровизацию. Создание единого информационного пространства, которое покажет открытость и прозрачность государственных услуг.

Имеется огромная необходимость разработки университетской науки, на опыте передовых стран. В университетах последнее время начали открываться офисы коммерциализации, их главной целью является внедрение науки в дело, взаимодействия субъектов научно-технической деятельности и субъектов частного предпринимательства.

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Effective Technology for Enhancing Learning Quality in Higher Education

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Abstract

This paper justifies the relevance of enhancing knowledge quality, personnel training, and demand for graduates of higher education institutions in the context of an open economy and international market competition. To address these problems, the need for new approaches, methods, technologies, and foreign experience in education is demonstrated. It is proposed to adopt the widely used methodology and technology of the so-called "flipped classroom" approach employed in other countries. The application of this methodology involves fundamental changes in the roles and activities of both students and teachers in the process of acquiring new knowledge. The new approach modifies the traditional learning scenario and alters the content of homework and in-class activities. Students independently learn the course material at home and then discuss and apply it in practice in the classroom with the support and guidance of the teacher. The performance of practical assignments is accompanied by critical reflection on the obtained information. In fact, what used to be done at home is now done in the classroom, and vice versa, and students have the opportunity to control their own learning.

The teacher creates a friendly online environment for interaction among students. Additionally, the teacher serves as a moderator of e-learning, monitoring and directing online discussions. The teacher acquires various roles, encouraging and motivating students, guiding and monitoring the education process, and providing feedback.

The paper presents the features of various flipped learning models for improving the knowledge quality of students in university education. Practical examples of the implementation of this new technology are given, which were developed by the authors using algorithms and syllabuses for two master's degree disciplines in the Department of Business Technology, based on the principles of modular learning and a competency-based approach to personnel training.

Keywords: knowledge quality improvement, educational process enhancement, modern teaching technologies, self-development of students, modular learning, flipped classroom

JEL codes: A12, A20, F6

1 Introduction

It is well known that in 1989, the Committee on Education and Science of UNESCO at the UN declared that the Soviet Union had the best education system in the world. However, subsequently, due to reforms aimed at transitioning the country to market relations and the commercialization of the education system, there was a widespread transition to credit technology and the Bologna system of education, which is generally characterized by the preparation of highly qualified specialists with a narrow profile. Such an approach could not fail to affect the horizons of students, the quality of their knowledge, and often leads to a lack of demand for university graduates in the job market. The country is taking large-scale measures to transition to the principles of sustainable development, digital transformation of the economy, implementing a new industrial policy in the conditions of Industry 4.0, mastering the latest high-performance technologies and innovations. All of this necessitates a radical improvement in personnel training based on modern achievements of scientific and technological progress.

Modern education in the university requires an increase in student independence, the activation of practical and analytical work. The introduction of information and communication technologies into the educational process reorients teachers towards the search for new technologies, in which the leading role belongs to self-educational activities and personal self-development of students (Vinogradova, n.d.).

Blended learning is a promising approach that allows for the introduction of new technologies into the educational process without abandoning traditional teaching methods, making the learning process more productive. This increases students' interest in mastering the material and forming professional competencies.

Blended learning includes: classroom work, out-of-class independent work of students; an information system used for creating, storing, collecting and/or delivering educational content; a wide selection of teaching materials; interactivity; control of students' independent work; a flexible system for evaluating students' achievements (Gizatulina, 2017).

A variety of blended learning is "flipped classroom" or "flipped learning," which seeks to change the traditional teaching scenario and change the purpose of homework and classroom work. In this approach, students independently master the content of the course (section, topic) at home by

watching video lectures or explanations, audio materials, and then discuss and apply the studied material in practice in the classroom with the support and assistance of the teacher, performing practical tasks and subjecting the information received to critical analysis. Essentially, what was previously done at home is now done in the classroom, and vice versa.

The purpose of this research paper is to establish definitions for the concept of "Flipped Class" and the correlation of this concept to the two core disciplines of the Department of Business Technologies, Faculty of the Higher School of Economics and Business on the basis of Al-Farabi Kazakh National University.

2 Methodology

The article has mostly applied theoretical research methods. The method of analysis and synthesis was used. The descriptive method covers all sections of this research paper. Literature review includes the method of deduction. The results and discussion section involves the method of ascending from the abstract to the concrete.

3 Literature review

Flipped Classroom is a teaching principle in which students primarily acquire new knowledge at home, while classroom time is dedicated to completing assignments, exercises, laboratory and practical research, and individual consultations with teachers (Wikipedia, n.d.).

This method has become a small "revolution" in relation to traditional education and an opportunity for professional development and self-improvement for progressive teachers who, while not neglecting the process of knowledge transfer, focus their efforts on personality-oriented learning and the development of student competencies. The "flipped classroom" technology was proposed by American scientists Jonathan Bergmann and Aaron Sams in 2000 (Itinson & Chirkova, 2020). The idea of this technology is that the main stages of the teaching and learning process, such as classroom lessons and homework, are completely changed. That is, students independently study the theoretical material through watching video lectures recorded by teachers or on educational websites on the internet, while practical lessons are devoted to practicing the acquired skills, solving problems, and discussing the main questions with the teacher. The flipped classroom implies such an organization of the learning process in which students already have some theoretical knowledge and understanding of the issue that will be discussed in the upcoming lesson.

This makes the interaction between the teacher and students more effective and productive, as students feel more comfortable and confident, ask

questions, and discuss new material with the teacher and classmates. Therefore, homework also becomes different. Very often, students do not understand some important topics while doing homework, so they prefer to study new material rather than do some tasks independently without teacher control.

Therefore, at home, students work individually or in groups in the electronic learning environment, listening to video lectures, studying additional electronic resources. In class, students expand their acquired knowledge, solve practical problems, and create educational projects on the given topic. Such organization of the learning process eliminates the difference between classroom activities and individual work of students. In order for the flipped classroom technology to be successful at all stages of learning, the educational process must be carefully planned and integrated.

Let us consider the peculiarities and advantages of the flipped classroom over the traditional one. Firstly, in the flipped classroom, students have the opportunity to control their own learning. They can learn at their own pace thanks to the availability of all necessary resources in the electronic learning environment. In addition, students can choose when and where to learn, within what time frame, can review materials at any time when they need them or get online assistance from teachers through chats and forums. Constant access to online materials allows students to keep up with the curriculum if they miss classes due to illness or other reasons. Secondly, the flipped classroom stimulates cooperation among students through mutual projects and collaborative work. Joint projects make students collaborate, learn from each other, and help each other. Finally, the flipped classroom increases students' responsibility for their own learning. Students become more independent and motivated compared to the traditional classroom environment. They learn to manage their time, work with the electronic course, develop self-learning and autonomous learning skills. In other words, the role of students in the learning process changes, making them active participants in the educational process.

The flipped classroom technology also affects the role of the teacher. In the flipped classroom, the teacher guides the learning process of students who have not had autonomous work experience in order to make the educational process more effective. The teacher must promote the creation of a friendly online environment for student interaction. Additionally, the teacher must act as a moderator of e-learning, monitoring and directing online discussions. Thus, due to the technology of the flipped classroom, the teacher acquires a range of different roles. The teacher must encourage and motivate students, guide and track the educational process, and provide feedback. The "flipped classroom" model is based on logical and easy-to-apply principles. Short

videos, viewed at home or any other convenient place, replace lectures delivered in classrooms. Initially, the teacher who decides to "flip" their class must determine the use of technical tools.

Varieties of Flipped Learning Model.

Currently, several forms of flipped learning are identified (Dumont & Berthiaume, 2016). The classical model of flipped learning involves providing students with theoretical material prior to the class. The materials for preparation can be given in the form of lecture notes or a textbook chapter, as well as slides, video, and audio documents. In the classroom, the teacher organizes a discussion of the studied material, explains complex points, answers questions, and uses interactive teaching methods. This model still resembles the traditional education system and has a transmitting character: first, theories, concepts, and models are studied, and then their practical application.

The next model of flipped learning, tentatively called "advanced," also involves two stages - out-of-class and in-class, and provides for a gradual increase in the level of tasks and expansion of activities. During the preliminary preparation, students independently search for information on a given topic, read articles, watch videos, prepare theses in mini-groups or individually, which they will present in the classroom, questions for debates, or round table discussions. They place the results of their work on a joint electronic platform so that the teacher and other students can familiarize themselves with them in advance and better prepare for the class. Therefore, monitoring of each student's independent work is carried out. In the classroom, presentations of prepared theses are given, discussions of the material read, an argumentative analysis of the work of each group, the creation of a common conceptual picture based on opinions, comments, and judgments expressed, or a mini-colloquium in which one group gives a presentation and another organizes debates.

And finally, the systemic or combined flipped model, as implied by its name, involves a combination of the first two models. The essence of this model lies in the reordering of the key components of the learning process rather than the location of a certain type of activity. The traditional sequence of competencies involved (memorization, understanding, application, analysis, synthesis, evaluation) is changed. First, the practical application of theory or model is studied and only then its theoretical justification. In the context of increasing the practice orientation of the learning process, this flipped learning model is a pedagogical approach that is most realistic, as in everyday and professional life, decisions often have to be made under conditions of uncertainty or risk, especially in the field of economics. At the distance stage, students work in mini-groups with a task or problem situation,

trying to assess it, conducting a search and analysis of the information necessary for an objective assessment of events, and proposing solution options. In the classroom, they present the information and sources found, and under the guidance of the teacher, analyze the task, compare the advantages and disadvantages of each of the proposed solutions. After that, the distance stage follows again, during which students study the theoretical foundations of the issue and the experience of activity related to the indicated problem. At the final stage, in the classroom, the results and consolidation of all the material studied on the topic are summed up, and the applicability of this model or theory regarding other situations is analyzed.

The methodology outlined suggests that the use of this technology changes the very nature of knowledge. In traditional pedagogy, knowledge is presented in a ready-made, structured, and logically organized form. In contrast, flipped learning requires active student participation in its discovery, comprehension, and processing for future use, stimulating interest in the subject matter and encouraging independent thinking and expanding the boundaries of knowledge. The role of the teacher also changes. The teacher becomes a consultant, organizer of various student activities, facilitator in the formation of specific competencies, supervisor and curator of work, manager, and moderator (Mandel, 2015).

As previously stated, flipped learning is based on the principle of "swapping places" between acquiring knowledge in the classroom and doing homework. In other words, students acquire knowledge through self-education, research, purposeful selection, and meaningful analysis of information. In the classroom, students exchange opinions, present their results, knowledge, and discuss and correct them. In traditional learning systems, homework serves to practice skills and reinforce materials, whereas with flipped learning, the reinforcement stage includes comprehension, clarification, expansion of knowledge, and various ways of generalization.

The flipped learning technology is highly consistent with the requirements of a modern specialist, representing a methodology for fully or partially transferring the process of knowledge acquisition to independent student activities. In doing so, teachers can use the freed-up time for interactive activities that develop the creativity, critical thinking, and problem-solving skills of their students (Europass Teacher Academy, 2020).

The task of a teacher during a lesson is not simply to present the content of a topic, but rather to draw the student's attention to key and/or difficult aspects and activate their process of practical cognitive activity. There are several reasons for using "flipped learning". Firstly, this technology contributes to a better understanding of the material, increases interaction with the teacher and other students, develops critical thinking and makes it a

natural part of the learning process. Secondly, when using this model, classroom time is used more rationally.

To effectively implement "flipped learning", a certain cycle is used: educational video; interactive work in the classroom; observation - feedback; assessment. Each stage requires the development of control and measurement materials.

"Flipped learning" has some similarities with anticipatory self-study, where students study new material before it is presented by the teacher in lectures or practical classes. The main difference is that in anticipatory self-study, the student carries out cognitive-search or creative activities outside the classroom, whereas in "flipped learning", the student studies new material using computer technology, and the teacher is virtually present and guides this process (video explanation, control questions).

The advantages of this method are that the student acquires knowledge at their convenience, not only in the condition of being present in class. This can be a video downloaded to a smartphone or tablet, or an audio lecture downloaded to a player. The student assimilates the material at their own pace, can watch the video or listen to the audio as many times as they consider necessary, pause for note-taking or simply to perceive new information.

Individual consultations with teachers help children overcome frustration and fear of not understanding new material. This also helps the teacher to see the progress and level of understanding of each individual student.

In-class time is not spent on delivering new material, which creates more opportunities for applying knowledge.

The methodology does not require special expensive technical devices. To implement the work within the framework of a "flipped classroom," a sound recording device (dictaphone, microphone), camera or webcam, and a computer with standard software may be required.

Students can use a greater number of additional sources for self-preparation at home: the internet, home books, dictionaries, etc.

4 Results and Discussion

The result of this study is the identification of the key characteristics of the concept of "Flipped Class" and familiarisation with the results of the implementation of this innovative type of learning in the framework of two major disciplines of the Department of Business Technologies, Faculty of the Higher School of Economics and Business on the basis of Al-Farabi Kazakh National University.

At the Higher School of Economics and Business of Al-Farabi Kazakh National University, the innovative educational technology of "Flipped

Learning" is being introduced into the educational process in the "Business Technologies" department. This technology allows for the use of prepared educational materials by the teacher for providing information with feedback to the audience, conducting testing, seminars, training, etc., in the study of a particular topic from the curriculum. The syllabus (GLS4301) for Strategic Management of Logistics Infrastructure for the Spring semester of the 2022-2023 academic year for the 7M11301 Master's degree program in "Logistics (by branches)" was prepared by Doctor of Economics B.K. Kazbekov with 15 topics for a comprehensive study of the course. The objectives of mastering the discipline are to develop the knowledge and competencies of the master's students in the management of material flows and related information and other flows in accordance with market needs during the creation and optimization of logistics infrastructure, as well as to develop the skills of the master's students in forming a warehousing network for companies in various business sectors (Kazbekov, 2022).

Expected Learning Outcomes (ELOs). Upon completion of the discipline, the master's students will know: ELO 1 - Composition, types, and interrelationship of objects of logistics infrastructure. Processes taking place within logistics infrastructure. Modern information technology and equipment used to optimize the functioning of logistics infrastructure. Objectives, tasks, and criteria for building an effective logistics infrastructure; ELO 2 - Ability to optimize the composition of objects of logistics infrastructure. Determine the effectiveness of the functioning of objects of logistics infrastructure; ELO 3 - Develop models of functioning for a company's warehousing network. Apply the appropriate tools to calculate the parameters of the functioning of objects of logistics infrastructure; ELO 4 - Substantiate strategic decisions for the formation and optimization of logistics infrastructure. Conduct a comprehensive analysis of the state and prospects of the development of logistics infrastructure; ELO 5 - Master the methods of optimizing the functioning of objects of logistics infrastructure and the processes taking place between them, as well as the tools for optimizing the warehousing network based on information technology.

Achievement indicators of expected learning outcomes (AI ELO). During the course of the discipline, a master's student should: AI 1.1 - be capable of independent mastery of new research methods, changing the scientific and scientific-production profile of their activities; AI 1.2 - possess skills in economic analysis of organizational activities and the development of organizational-management decisions in the organization of logistics infrastructure and the design of infrastructure objects; AI 1.3 - be able to generate fundamentally new ideas and products, possess creativity and initiative in justifying the stages of strategic planning, applying the principles

of logistics analysis of the company; AI 1.4 - possess methods of organizing logistics infrastructure and designing infrastructure objects; AI 1.5 - be able to formulate and test scientific hypotheses, choose and justify instrumental means, modern technical means, and information technologies for processing information in accordance with the scientific task set; AI 2.1 - be able to analyze calculation results and justify the conclusions drawn, understand the stages of logistics business processes for effective management of production with a system of logistics business process indicators; AI 2.2 - possess methods of strategic analysis of logistics infrastructure and designing infrastructure objects; AI 2.3 - be able to use strategic management tools to develop a strategy for forming a network of infrastructure objects; AI 2.4 - be capable of analyzing, verifying information, and assessing information during professional activities; AI 2.5 - be able to replenish and synthesize missing information when necessary and work under conditions of uncertainty.ID 3.1 - Able to develop corporate strategy, business strategy, and functional strategies for the organization; ID 3.2 - Able to justify and choose methods for making strategic, tactical, and operational decisions in managing infrastructure objects; ID 3.3 - Possesses skills in analyzing regulatory documents, statistical and other information that regulate and characterize the professional field of activity, and building diagnostic tools for enterprise strategies; ID 3.4 - Able to apply various tools to calculate the parameters of the functioning of logistics infrastructure objects; ID 4.1 - Able to identify the data necessary to solve management tasks for infrastructure objects; ID 4.2 - Possesses methods of operational analysis and can use operational planning tools to solve operational management tasks for infrastructure objects; ID 4.3 - Able to carry out monitoring of physical distributions and sales, determine types, and parameters of the analysis of product and company competitiveness; ID 4.4 - Able to conduct a comprehensive analysis of the condition and prospects of logistics infrastructure development; ID 4.5 - Able to justify the choice of methods for making strategic, tactical, and operational decisions in managing infrastructure objects; ID 5.1 - Able to select and justify instrumental tools, modern information technologies for processing information in accordance with the task in the field of management of infrastructure objects; ID 5.2 - Able to apply tools for optimizing the warehouse network based on information technology; ID 5.3 - Able to justify the choice of tools, technical means, and information technologies used to support and ensure the implementation of management decisions; ID 5.4 - Able to develop instrumental strategies for the development of infrastructure objects based on the use of input, internal, and output material flows planning.

As an example of the productive implementation of the "Flipped Classroom Technology," the syllabus (BPL 5301) "Business Processes of

Logistics" is proposed for the 7M11301 master's degree program in "Logistics (by branches)," which consists of 15 topics for comprehensive study of this course (Kazbekov, n.d.).

The aim of the discipline is to develop the ability of the master's student to develop market strategies using modern logistics business processes for evaluating business planning results in logistics. Upon completion of the course, the master's student will be able to:

LO 1 - explain the concept of logistics business processes based on scientific planning and management tools; LO 2 - master the procedure of logistics business processes for recommending fragmented planning optimization; LO 3 - apply diagnostic tools for logistics business processes to analyze and evaluate the current activities of the enterprise; LO 4 - develop supply chain management in the logistics planning system based on information flows for the effectiveness and flexibility of the company's development and competitiveness; LO 5 - develop instrumental strategies for business process elements and a complex of work based on the use of planning for the need for input, internal and output material flows.

During the course of their studies, a graduate student should: LO 1.1 - determine the goals, tasks, functions, and objects of studying logistics business processes; LO 1.2 - justify the stages of strategic planning using logistics analysis principles in a company; LO 1.3 - form the components of strategic planning for logistics business processes; LO 1.4 - classify logistics business processes and their main characteristics in production organizations; LO 2.1 - understand the stages of logistics business processes for effective production management with a system of logistics business process indicators; LO 2.2 - understand the diagnostic tools for logistics business processes and optimization of planning models; LO 2.3 - apply the procedure for directions of improvement and evaluation of business process organization; LO 2.4 - justify the types of external logistics business processes and optimization methods in business. LO 3.1 - determine the parameters of external logistics business processes and business process principles based on analysis and evaluation of the company's current activities; LO 3.2 - develop diagnostic tools for enterprise strategies; LO 3.3 - develop corrective parameters of business processes for enterprise forecasting. LO 4.1 - classify objects and evaluation parameters for planning and determining control stages and analysis; LO 4.2 - manage events in the logistics business process for demand calculation, evaluation of market potential/capacity methods; LO 4.3 - monitor physical distributions and sales, determine types of parameters for analyzing product and company competitiveness; LO 4.4 - propose an active supply system for enterprise development strategies based on logistics business process planning. LO 5.1

- apply planning methods for key business processes: sales management and customer service; LO 5.2 - develop forecasting parameters for the product flow based on information flows for analyzing the company's products; LO 5.3 - develop an analysis and selection of project sensitivity and risk methods, promoting the logistics business process; LO 5.4 - choose fragmentary optimization of business processes and plan deliveries.

5 Conclusion

Thus, the "flipped learning" technology indeed solves the problem of creating a situation of open communication during class, allowing each student to show initiative and activity, independence, selectivity in methods of activity; provides conditions for independent meaningful study of the topic; assists in the analysis and evaluation of new knowledge. At the same time, this technology allows the teacher to organize learning in accordance with the State Educational Standard of Higher Education, develop skills in information and communication technologies in teaching their subject, and increase their level of professional training, all of which contributes to a significant improvement in the quality of modern education and leads to the solution of the main task of educational activities.

Students are actively involved in the cognitive process. "Flipped learning" motivates students to engage in independent activity, so the main part of the theoretical material is mastered by students independently at home in an electronic environment using various teacher-prepared resources (video lessons, presentations, etc.). Thus, this new innovative technology stimulates the development of personal characteristics such as activity, responsibility, and initiative. This technology also contributes to the development of meta-subject skills such as self-organization and time management. Most importantly, this technology improves the quality of students' knowledge and contributes to the mastery of subject results.

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СОДЕРЖАНИЕ

МАТЕРИАЛЫ
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