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JEL Classification: F23, L19, O33

Modification of Value Management of International Corporate Structures in the Digital Economy

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Purpose: Investigate formats for managing the value of international corporate structures, taking into account the formation of digital assets, and develop recommendations for introducing precise modifications to the management of the value of international corporations in the digital economy.

Design/Method/Approach: Systematic, synergistic, conceptual and methodological approaches are used, involving the use of the method of analysis and synthesis, modeling, formalization, methods of statistical and economic analysis, modeling, expert support and evaluation.

Findings: The formation of a new external environment of corporations - the "digital environment" - is substantiated as a space for the manifestation of competitive advantages of the digital transformation of the economy, which is characterized by a clarification of the influence of digitalization on the activities of international corporate structures. The factors of increasing the cost in the digital environment are identified, being based on the developed modified approach, which takes into account both the change of the previously known cost factors in the digital environment and the emergence of new, previously unformulated cost factors, which allow to create a scenario of the economic activity of the corporation in the digital environment, to establish the dependence of the selected factors cost and will divide the factors acting in the formation of the digital environment, and the factors that manifest themselves directly in the digital economy. The concept of cost management of the corporation has been developed, in terms of assessing the new external corporate environment, taking into account the influence of digital factors, identifying new cost levers, taking into account radical changes in technological processes, including recommendations on the adaptation of new digital cost management tools, which allows assessing the digital component of the growth of modern markets and takes into account both the creation and destruction of value under the influence of the digital economy.

Theoretical Implications: The role of the digital economy in relation to the models and tools of corporate governance has been determined. The points of contact and interaction of corporate strategies and the process of business digitalization based on the effective management of the value of the corporation have been studied.

Practical Implications: The results and recommendations of the study can be implemented in long-term programs for the digitalization of international corporate governance practices and digital support for the development or adaptation of corporate strategies in order to implement the complex potential of the corporation.

Originality/Value: The specificity of the implementation of digital economy tools in the organizational formats of the activities of international corporate structures has been studied. Modified models for improving corporate value management based on blockchain technologies and digital cost control as part of a corporate strategy have been proposed.

Research Limitations/Future Research: The obtained results of the research can be used in the context of the development of national and branch programs for digitalization of corporate management and the implementation of digital technologies in the model of corporatization of enterprises and organizations of various forms of ownership.

Paper Type: Theoretical

Keywords: Digital Economy, International Corporation, Corporate Management, Strategy, Shareholders, Corporation Value, Blockchain, Controlling, Dematerialization of Assets.

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Модифікація управління вартістю міжнародних корпоративних структур в умовах цифрової економіки

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Мета роботи: Дослідити формати управління вартістю міжнародних корпоративних структур з урахуванням утворення цифрових активів, та розробити рекомендації щодо введення точних модифікацій в управління вартістю міжнародних корпорацій в умовах цифрової економіки.

Дизайн / Метод / Підхід дослідження: Використано системний, синергетичний, концептуально-методологічний підходи, що передбачають використання методу аналізу та синтезу, моделювання, формалізації, методів статистичного та економічного аналізу, моделювання, експертного супроводження і оцінювання.

Результати дослідження: Обґрунтовано формування нового зовнішнього середовища корпорацій – «цифрового середовища» – як простору прояву конкурентних переваг цифрової трансформації економіки, що відрізняється уточненням впливу цифровізації на діяльність міжнародних корпоративних структур. Виявлено чинники збільшення вартості у цифровому середовищі, на основі розробленого модифікованого підходу, що враховує як зміну відомих раніше факторів вартості у цифровому середовищі, так і появу нових, раніше не сформульованих факторів вартості, що дозволяють створити сценарій господарської діяльності корпорації у цифровому середовищі, встановити супідрядність обраних факторів вартості та розділити фактори, що діють при формуванні цифрового середовища, та фактори, що виявляються безпосередньо в цифровій економіці. Отримала розвиток концепція управління вартістю корпорації, в частині оцінки нового зовнішнього корпоративного середовища, врахування впливу цифрових факторів, виявлення нових важелів вартості, обліку радикальних змін у технологічних процесах, що включає рекомендації про адаптацію нових цифрових інструментів управління вартістю, що дозволяє оцінити цифрову складову зростання сучасних ринків та враховує як створення, так і руйнування вартості під впливом цифрової економіки.

Теоретична цінність дослідження: Визначено роль цифрової економіки у прив'язці до моделей і інструментів корпоративного управління. Досліджено точки контакту і взаємодії корпоративних стратегій і процесу цифровізації бізнесу на засадах ефективного управління вартістю корпорації.

Практична цінність дослідження: Отримані підсумки і рекомендації дослідження можуть впроваджуватися в довгострокові програми цифровізації практики міжнародного корпоративного управління та забезпечення цифрової підтримки розробки або адаптації корпоративних стратегій з метою реалізації комплексного потенціалу корпорації.

Оригінальність / Цінність дослідження: Досліджено специфіку впровадження інструментів цифрової економіки в організаційні формати діяльності міжнародних корпоративних структур. Запропоновано модифіковані моделі покращення управління вартістю корпорації на основі технологій блокчейн та цифрового контролінгу витрат в межах корпоративної стратегії.

Обмеження дослідження / Майбутні дослідження: Отримані результати дослідження можуть бути використані в контексті розробки національних і галузевих програм цифровізації корпоративного управління та впровадження цифрових технологій в моделі корпоратизації підприємств і організацій різних форм власності.

Тип статті: Теоретичний

Ключові слова: цифрова економіка, міжнародна корпорація, корпоративне управління, стратегія, акціонери, вартість корпорації, блокчейн, контролінг, дематеріалізація активів.

1. Introduction

Modern conditions of globalization and the need to develop high-tech industrial production determine the expediency of adapting the practice of international corporate management to the new conditions for doing business in the context of global digitalization and the spread of digital business technologies. The development of international corporate entities is associated both with a number of significant internal problems (insufficient quality of management, physical and moral depreciation of the technical and technological base, a high proportion of state corporations, etc.), and external ones, primarily related to the strengthening of integration processes, consolidation of international corporate structures, manifestations of the digital economy, including the spread of distributed database technologies (blockchain), smart contracts, automation and robotization of production, accompanied by increased global competition (Aguilera, & Crespi-Cladera, 2016; Lim, 2022b). The valuation of the activities of public corporations in the last two decades has become an integral part of the study of international business and the integral measurement of entrepreneurial success. Undoubtedly, the question is of interest: is it possible to target the management of the corporation's activities, aimed at achieving cost indicators by influencing the most significant parameters, or is cost management possible only because of a coordinated balanced influence? In other words, should a successful business think about the fact that its performance indicators could be achieved not only through entrepreneurial initiative, but also through parametric influence on individual components of activity? The answer to these questions lies precisely in the field of research of the impact of value factors on international corporate structures activities. The relevance of the assigned task at is determined by the fact that the transformation of the economy, the transformation of interactions between individual corporations, and the transformation of the internal sphere of corporate activity under the influence of digital technologies have already achieved revolutionary (breakthrough) changes and require changes in approaches to business value management at the present time.

In the conditions of the digital economy, it is the cost management that allows to ensure the relationship between the interests of stakeholders and management decisions the most at both strategic and operational levels. Solving these problems requires the development of a methodology, ensuring the existence of a scientifically based concept, modifications and tools of corporate management based on a cost criterion, which makes it possible to formulate the development goals of international corporate structures and evaluate the effectiveness of their activities in a digital economy purposefully.

2. Theoretical Background

Despite a significant number of publications on corporate value management in a global economy, we can rely on the definition of corporate value factors, which is presented in scientific papers in our approach (Rugman, & Verbeke, 1992; McMillan, 2008; Bainbridge, & Henderson, 2016), where the value factor is understood as “any variable that affects the value of a corporation”, and the priority of the financial and economic approach is given over the estimating one.

In a few scientific works (Ternai, Török, Varga, 2017; Athey, & Luca, 2019; Chen, 2019; Makedon, et al. 2019) it is proposed, first, to identify and classify the manifestations of “numbers” at different levels of entrepreneurial structures to adapt the methodology of corporate analysis. At first it is proposed to determine the system-forming factors for the formation of the digital economy in a corporation: (a) the formation of a qualitatively new structure of economic assets that meet the economic priorities of the digital economy; (b) use of electronic technologies and services; (c) collection and processing of large amounts of data in digital form; (d) formation and maintenance of favorable organizational, infrastructural and regulatory characteristics of the development of digital corporate technologies.

The works (Knickrehm, Berthon, & Daugherty, 2016; Kostakis, Roos, & Bauwens, 2016; Nagle, Seamans, & Tadelis, 2020; Wang, 2022) already unravel the complex development of digital economy institutions, determine the factors of preserving the sovereignties of countries under the conditions of globalization of the economy, ensuring the information and economic security of the state and corporate business, promoting the improvement of the quality of life of citizens and protecting personal data and privacy of citizens in the digital space. Developing in a global environment, the digitalization of the economy is intertwined with its socialization (Stukalo et al., 2018), and in our view, forms new global problems and challenges.

Such scientists as (Gupta, et al. 1997; Bhupatiraju, et al. 2012; Makedon, et al. 2022) believe that the diversity of digital factors, despite the direct relationship with information technologies, also influenced on the identification of the digital economy itself. They state that the digital economy adapts, changes and creates new things in almost all elements of the external environment. In parallel, we should highlight works (Bartlett, & Ghoshal, 1989; Barney, & Griffin, 1992; Buckley, 2009; Morgan, 2012; Sama, Stefanidis, Casselman, 2022) in which, first of all, it is noted that the economic conditions of activity are changing globally (starting from the methods and means of payment to the organization of logistics flows), the ways and methods of the corporations are changing themselves (from the transfer of activities into the digital space to the use of fundamentally new technologies, including artificial intelligence), economic factors are changing (in terms of the creation of new (digital) barriers and the formation of an oligopolistic conspiracies of digital market leaders), social factors are changing (manifested most clearly in the wide spread of social networks and messengers), national factors are changing (so developing countries get their chance to join the developed countries, no longer being burdened by the technological gap), natural factors are changing (the need to study ecological and other factors that reflect the processes of energy consumption of cryptocurrencies), the methods of regulation at the level of state and international structures are changing, new aspects of economic security are emerging (primarily related to cyber-attacks).

Such famous scientists as (Acedo, et al. 2006; Grosman, Aguilera, & Wright, 2018) justify the conclusions that the basic prerequisite for digitization of corporate structures is the combination of two levels of efficiency of the digital corporation - technological efficiency and economic efficiency. Such a balance was characteristic for the early stages of efficiency studies, which were used in economic research and reflected the results of the implementation of the achievements of scientific and technical progress. A breakthrough solution to the problem of assessing actual efficiency (Makedon, et al. 2020; Lim, 2022a) is the introduction of accounting approaches in the analysis of the efficiency of corporate structures, which is manifested in the integrity and priority of profit and profitability indicators.

According to (Ahmad, & Ribarsky, 2018; Myers, Hulks, & Wiggins, 2012), the key position of the digital economy is the continuous search for assets that provide income that exceeds average profitability. Many market theories are based on this concept - the theory of competition, value management, risk management and many others. These theories are based on the fact that an effective choice of assets determines future profitability, and mistakes in this choice lead to catastrophic consequences for a particular business.

The very digital transformation of the economy affects the actualization of principles taking into account modern trends, the development of the information society and the complex penetration of networks into the processes of interaction and disclosure of information, which cannot but affect the relationship between the corporation and its shareholders - so, according to (Peng, 2021), “the digital revolution is pushing every corporation to move from a business model based on products and services to a

business model based on networks and platforms". It is necessary to convey the opinion (Zakaria, Aoun, & Liginlal, 2021; Lynn, et al. 2022) that the principles of corporate management should not remain standards, bureaucratized procedures and dictate strict rules - taking into account the constant variability of the external environment, the need to reduce risks, large volumes of information data of the modern economy, corporate management should provide opportunities to develop and make adequate decisions taking into account the time factor and ensure the growth of corporate value.

3. Purpose of research

To investigate the modern features of the formation of the value of corporations taking into account the creation and maintenance of digital assets, and to develop methodological recommendations for the implementation of modifications in the management of the value of international corporate entities in the conditions of the digital economy and digitalization of the business environment.

4. Materials and Methods

Our research will be built on the following methodological basis:

1. When considering specific issues and processes of corporate management in the digital world, we will be using the scenario method to study the penetration of digital achievements into the basic models of corporate management. Let us highlight the following scenarios: 1) Scenario 1. Using digital tools to achieve goals and solve problems without changing the essence of corporate management and basic theoretical approaches. In this case, it is necessary to talk about the convergence of traditional approaches and digital technologies, which will require the development of new methodological structures. This scenario will be implemented by most corporations, with the exception of leading corporations, until the digital transformation of business processes is fully completed. This approach, on the one hand, allows changes in economic realities, on the other hand, preserves the sustainability of corporate education. 2) Scenario 2. Modification of certain corporate management procedures based on digital technologies. New technologies will receive priority only if they allow solving new tasks that were previously inaccessible, either because of the complexity or because of the impossibility of obtaining sufficient information. 3) Scenario 3. Platformization of corporate management as part of the evolution of the first and second scenarios, as well as on the basis of a fundamentally new solution.

2. Factorial approach. Its implementation is based on the thesis that the value of intangible assets should go to "0" in the digital economy. In our opinion, this approach is wrong, as it does not take into account such a feature of the digital economy as the creation of augmented and virtual reality. If this reality has a value of zero, it is unlikely to be created. Therefore, within the framework of the factor approach to identify the manifestations and effects of the digital economy, it is essential to highlight the value factors. So, in order to identify cost factors, we will use two fundamentally different algorithms: 1) choosing a criterion / or a set of criteria, such as: cash flow for capital owners or economic added value, and we establish the significance of the influence of certain economic manifestations on the assessment of the value of the corporation through factor analysis. 2) identification of fundamental / essential factors to assess the value of the corporate structure. At the same time, the method of accounting for the influence of the identified factors remains the evaluator's prerogative. We will define this approach as factor-oriented and focused on the external and internal environment of the corporation, and its justification is more usual for evaluation activities (including for taxation purposes, justification of mergers and acquisitions). It is obvious

that for the evaluation process, depending on the goal, both methodological approaches will be used to manage the value of the corporation in the conditions of the digital economy.

3. The modern development of corporate management takes place in the direction of the "corporate management 2.0" methodology, it is these principles and, accordingly, their practical use that form modern trends in the work of international corporate structures. We define the following principles and approaches: emphasis on tasks to achieve long-term goals; formation of interaction mechanisms between the board of directors, the management of the corporation and its shareholders, including increasing the involvement of the latter ones; increased requirements for the board of directors regarding their professional competences and even national or gender composition; development of a flexible system of public monitoring of the corporation's activities.

4. Among the methodological and practical approaches, the involvement of blockchain technology into the corporate management system as a technology of a distributed network of information data exchange between interested parties based on protected and confirmed records and virtual transactions, has been also included by us. This can cause changes not only in the corporate management system itself in terms of data formation and its dissemination and transmission, information disclosure, but also in the very procedure of decision-making, voting, management of agreements, etc.

5. Results and Discussion

5.1. International Environment of Corporate Management

Modern corporate management is inseparable from a study of the international environment of permanent operation. Manifestations of the external environment are no less significant for the economic result of the activities of international corporate structures than the internal sphere of the corporation's activity, and the external changes which are taking place must be considered in the entire set of decisions made. The appearance of such a term as "digital economy" should be attributed to significant modern changes in the environment. This phenomenon in its essence integrates all the changes that have taken place, are taking place and will take place in the global economic sphere under the revolutionary influence of information and communication technologies. The digital economy is recognized as an actual trend in the development of modern society, business, industrial production, state administration, trade and services, and the daily life of citizens. The formation of the global digital space becomes the next stage of development in the "new industrialization - digitalization" chain and is caused by the need to ensure the technological leadership of subjects and states based on information and communication and related technologies (Bazzoun, 2019). These processes are accompanied by the modernization of traditional manufacturing and service industries and the reformatting of trading-purchasing and logistics activities.

The digital economy, speeding up communication processes, is introduced into practical life faster than it is possible to identify and systematize the main trends, therefore, in our opinion, it is currently impossible to focus on the criterion-based justification of cost factors to the full, because there is no necessary empirical basis for research while any significant period. Therefore, it is impossible to get an answer to the question, which criterion of the value of corporate business seems to be the most in demand now of time. Nevertheless, we will try to confirm the factor influence of the digital economy on the value of corporations based on the results of our research, within which we can determine that the economic growth of the country is not confirmed by the linear factor of the increase in the level of profitability of public corporations (Fig. 1).

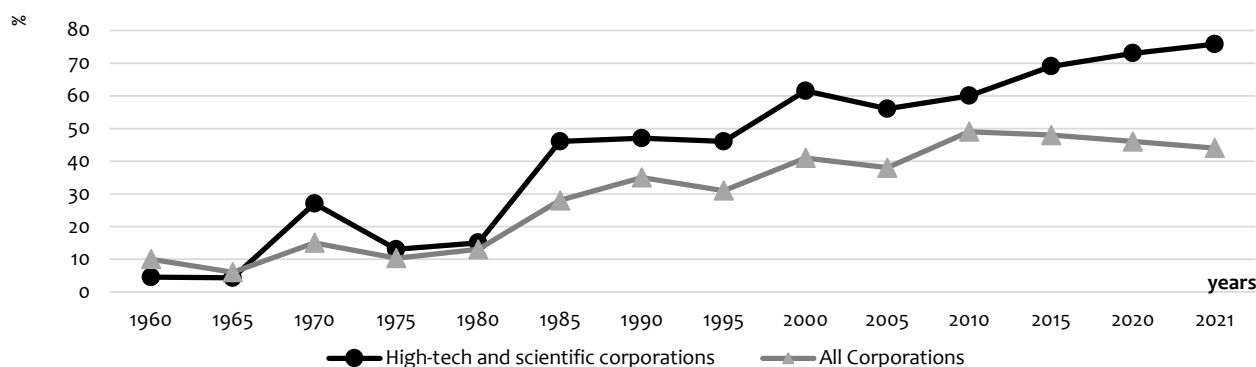


Figure 1: Dynamics of the existence of unprofitable corporations in the world in the period from 1960 to 2021

Source: UNCTAD Digital Economy Report, 2021

As can be seen from Fig. 1 the share of unprofitable corporations is constantly growing, for example, from 18% in 1980 to 46% in 2021, but it is smaller than the share of unprofitable high-tech and science-intensive corporations (in the field of computing, electronics, software, pharmaceuticals, biotechnology, etc.), which was 69% in 2021. Of course, business risks for high-tech corporations are higher than for the economy. However, the financial benefits are not reflected in the financial statements (in the items of profit or losses), and the share of unprofitable corporations grows every year. Therefore, not only profit (as a result of accounting) determines the impact on the value of corporations (because the growth of capitalization is confirmed by statistical data, and financial statements may contain data on losses), but the digital economy can change the identification of the effectiveness of the activities of modern corporations completely (Tab. 1).

Table 1: Dependence of performance indicators and growth of European corporations on the level of digitalization, 2015-2021

The value of the digitization indicator of corporations, %	Total income for shareholders, %	Average annual sales growth rate, %
Lower 30	15	4
From 30 to 55	18	10
More than 55	42	18

Source: UNCTAD, 2021

According to these facts it follows that the dematerialization of assets becomes precisely the evolutionary process of transformation of the structure of assets of a corporation operating in the conditions of a digital economy, when intellectual capital, represented by intangible assets, namely, information systems, software, begins to prevail significantly in the capital structure comparing to physical capital provision and information in the form of databases of various formats and security. Dematerialization of assets accompanies the use of digital platforms as a business model of digital corporations objectively (Fig. 2).

Vertical integration, as presented by market capitalization, in the long term does not bring new factors of added value, since the basic principles used by large corporations before this have been fully implemented and taken into account in the maximum historical period of time practically, the value of corporations and digital technologies or refined them, or began to ensure the process of diversification. Therefore, from the point of view of cost factors, the digital aspect is functional for technological solutions and does not bring, from the point of view of new solutions, additional value creation, apart from what is realized in cost reduction. The last decade in the person of the four leading digital corporations has demonstrated that the decisions that were used as a basis for evaluating their business turned out to be fair, and clarification is possible only on the basis of detailing and studying of already known factors, which does not diminish the complexity of the tasks, but does not bring anything new of a scientific result. For example, the costs of information content of Big Data turn out to be much higher

than predicted originally (IDC - *Global ICT Spending - Forecast 2020-2023*, 2020). Nevertheless, it should also be noted that the corporations that made the transition to information and communication and digital technologies directed their main efforts to the improvement of individual business processes, and, accordingly, the degree accounting of improvement of key business processes was in the attention of many researchers.

5.2. Digitization and Formation of the Corporation

Concepts of distributed (decentralized) networks made it possible to eliminate vertically integrated solutions for data storage and processing and to form new solutions that exclude intermediaries. Therefore, it is necessary to consider a separate group of factors, which is manifested only in a distributed digital environment directly (for other information solutions, these factors should be excluded simply), which are presented in Fig. 3.

The action of the factors that give an advantage in the formation of the digital environment is caused due to the fact that the new method of production declares a significant increase in labor productivity, including operations and access to them that were considered completely unsuitable for automation previously. The study of these factors should be aimed at identifying the degree of revolutionaries' of the decisions made, but the classification of the corporation's activities into the sphere of the digital economy will increase its value for a long time (even due to tax benefits that are used in most countries to support high technologies) (Abd Razak, Noor, & Jusoh, 2021).

Digital confirmation of the reputation of the participants of the future agreement will provide a significant reduction in the costs of establishing the security of the partner for participation in the agreement, when each of the parties can make transactions using digital confirmation and features of blockchain technology. The blockchain can confirm the reliability of the transaction participant by clarifying the solvency, identity, and reputational data collected in the network. Such a digital portrait allows ensuring maximum freedom for decision-making, especially in various competitive procedures, when a completely unknown corporation that has a digital mandate of trust can participate in the competition (Limna, Kraiwani, & Siripipatthanakul, 2022).

From our standpoint, in order to take into account, the impact of the digital economy on the value of corporate business, it is necessary to use a modified approach, which is characterized by the obligation of several cyclically repeated stages, that is, the identification of value factors must go through two, and sometimes even three, iterative procedures will be determined before the value factors are selected.

Considering the development of the concept of corporate management in the digital world, the following scenarios of penetration of digital achievements into the basic models of corporate governance should be highlighted.

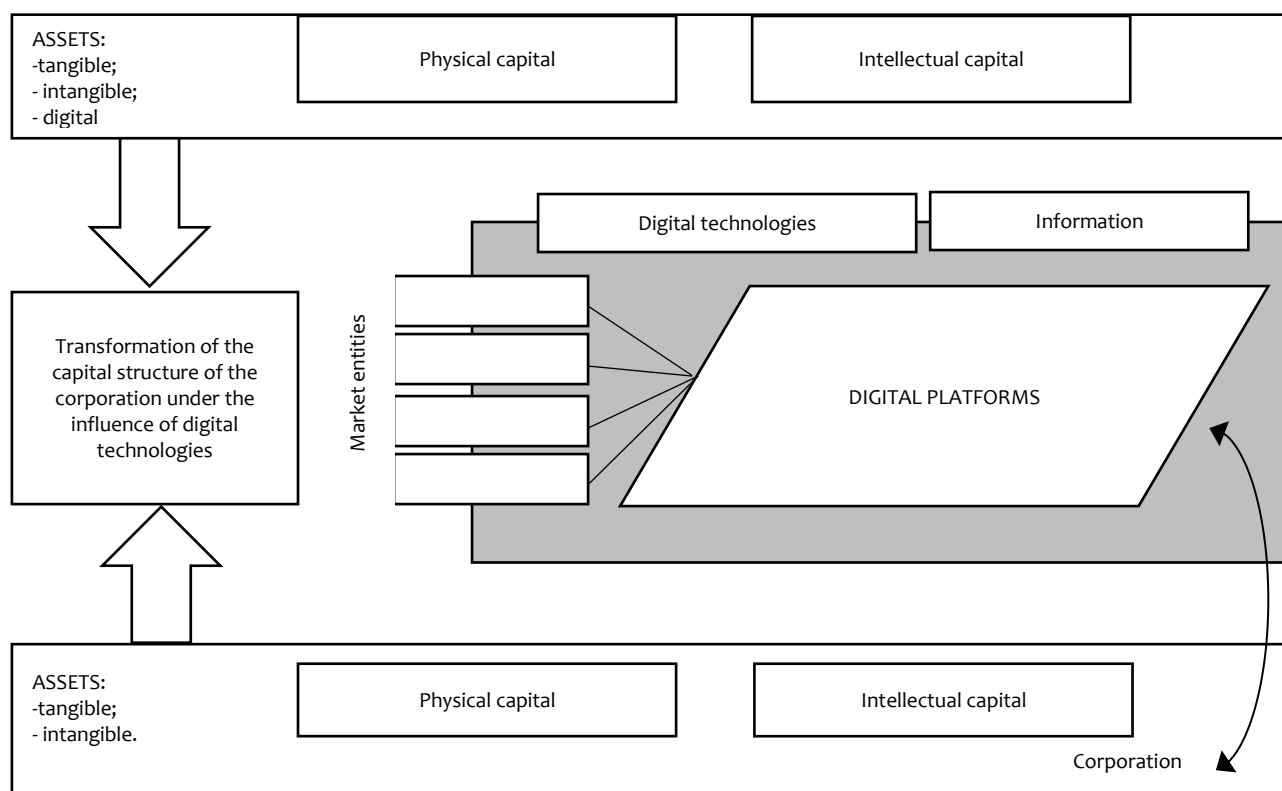


Figure 2: The process of dematerialization of corporate assets (Author's own visualization)

Source: Author's own visualization

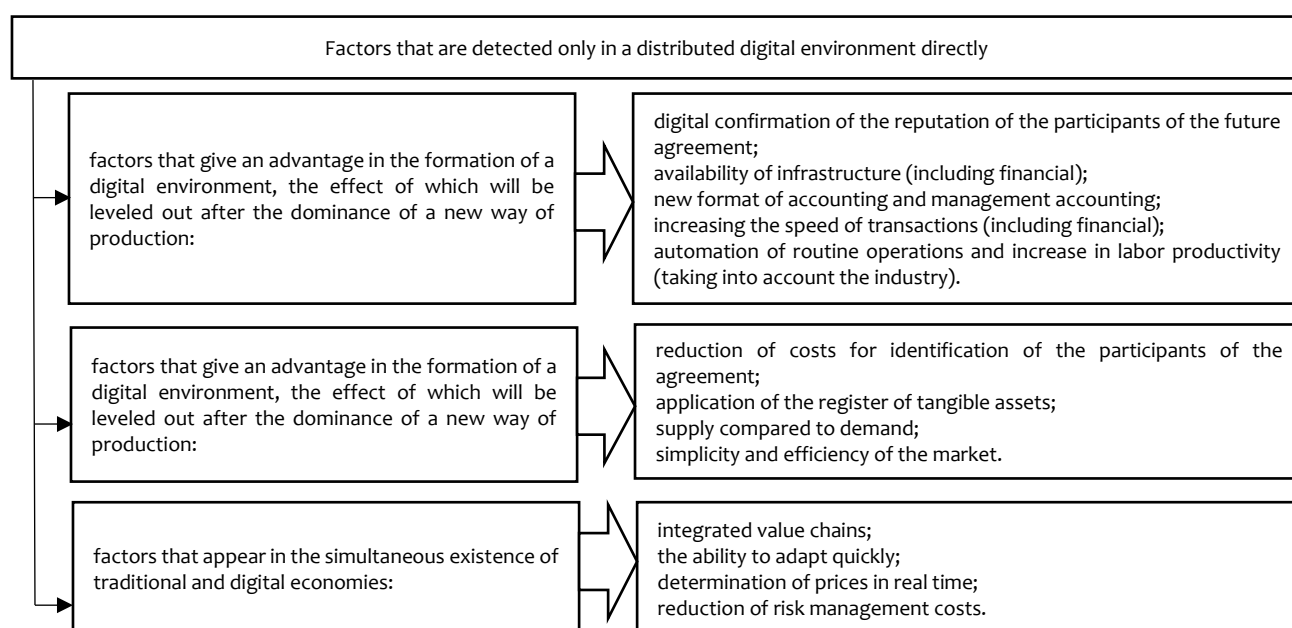


Figure 3: Factors of the formation of the corporation value, which are revealed only in the distributed digital environment directly

Source: Author's own visualization

Scenario 1. Using digital tools to achieve goals and solve problems without changing the essence of corporate management and basic theoretical approaches. And, in this case, it is necessary to talk about the convergence of traditional approaches and digital technologies, which will require the development of new methodological structures. This scenario will be implemented by the vast majority of corporations, with the exception of leading corporations, until the digital transformation of business processes is fully completed. Such a conservative approach, on the one hand,

allows changes in economic realities, on the other hand, preserves the stability of the corporate entity.

Scenario 2. Modification of certain procedures of corporate management while taking into account digital technologies. New technologies will receive priority only if they allow solving new tasks that were previously inaccessible, either because of the complexity or because of the impossibility of obtaining sufficient information.

Scenario 3. Platformization of corporate management as an evolution of the first and second scenarios, and the basis of a fundamentally new solution. Even though the solution of many basic tasks can already be performed in a digital representation today, the question remains open as to whether such management will be the own development of each corporation or will turn out to be a universal solution that allows for additional settings that consider the specifics of each corporation.

Investigating the possible directions of the concept development in the future, it is necessary to understand - within the framework of which scenario the toolkit of corporate solutions will be implemented. Therefore, we must define the concept of "digital corporation" at first, highlighting the distinctive feature, which assumes that the main productive force used in such a corporation should be digital technologies. In our opinion, it is unacceptable to consider a digital platform that describes the activities of the corporation as a digital corporation. Until digital technologies become a productive factor for the corporation, it is impossible to justify the need for a transition to digital corporate management (Mergel, Edelmann, & Haug, 2019). It is obvious that there will be quite a large number of corporations working on the indirect effects of digitalization in the near future, but in order to identify such effects, a comparative analysis with digital corporations is necessary.

A digital corporation must meet at least two signs of digitalization - external and internal, that is, its own internal business processes must be digitized and implemented into a digital external environment. Understanding that such a corporation cannot be created now, and real corporations will have one or another degree of approximation to digital solutions, however, despite the simplicity of comparison with traditional corporations, it is necessary to develop the concept of nominal digital management in order to form a new basis for comparing Digital solutions, which are developing (Rong, 2022). For further research, it is necessary to classify corporations according to the following 5 groups (Tab. 2), which will allow not only to assess the degree of approximation to the "digital corporation" category, but also to determine the further possibility of interaction to create added value:

- digital leaders, i.e. corporations, which are actually a model of the future, which formed (or created their own) digital environment, provided with digital assets, implemented digital technologies and the result of which is a digital product (Calero-Medina, & van Leeuwen, 2012);
- enterprises are organizationally receptive and technologically ready for digital interaction, but do not implement it. As a rule, they are characterized by individual solutions that are superior to similar solutions on a global scale; and the digital environment of such corporations is internal;
- corporations are organizationally ready for digital changes. Such corporations are characterized by the fact that they are attractive for interaction in the external digital environment, but they have not started to carry out their own transformations. For example, corporations that produce digitization equipment may not be digital (Digitalization Task Team, 2021);
- corporations requiring organizational changes and technological modernization, but the subject of which will be in demand in the digital future;
- outsider corporations whose digital future is in doubt.

This classification allows both to adjust the corporate management models of each specific corporation, and to assess the needs for improving corporate management at each of the levels. So:

- a) for leading corporations, changing process of the model of corporate management becomes an urgent need and it is necessary to implement the third scenario;
- b) for corporations which are accommodated to digitalization organizationally and technologically, a choice between the first and second scenario is possible;

- c) for corporations that are ready for digital transformations organizationally, it is necessary to implement the second scenario;
- d) for corporations that need organizational changes and technological modernization, only the first scenario is possible.

In order to build an improved model of corporate management, it is necessary to recognize the significance of the influence of the problem of centralization and decentralization. The fact is that modern digital technologies offer both hierarchical and distributed management. Traditionally, corporate management involved the use of hierarchical structures. However, forming a new model, in our opinion, we should make a number of such assumptions related to the penetration of network (distributed) decentralized solutions into corporate management. Digital technologies ensure the sustainability of distributed interaction, and this form, according to a number of researchers, appears to prevail in digital markets. Therefore, the hierarchical storage, processing and use of data (both large and small) becomes a degenerate form of distributed solutions, when the entire network will be within the framework of one corporation and will be focused on interaction exclusively with the consumer due to efficiency criteria (Makedon, 2022). However, such a scenario is still unrealistic, so international corporations are striving to find competitive advantages based on individual factors, and not on the entire spectrum of created products and services, leaving the opportunity for network interaction.

As a result, at the level of interaction of shareholders in a digital corporation, a distributed network becomes a priority, which does not provide the possibility of obtaining a majority of one shareholder over another, in any other way than in compliance with the law and the rights of shareholders. Therefore, at this level, starting with the interaction of shareholders, it is most appropriate to use peer-to-peer networks with rights and restrictions fixed for each shareholder. Which technologies will be used technically (simple blockchain or smart contracts, or another technical solution) will be demonstrated in the further development, but the technical solution has no fundamental importance regarding the requirements for this network. In addition, there is currently no certainty that this solution will be implemented either by the corporation itself, or by using an off-the-shelf platform, or by using solutions proposed by the registrar or depository (Makedon, Mykhailenko, Vazov, 2021; Wang, et al. 2022).

5.3. Tools of the Digital Economy in the Development of Corporate Management

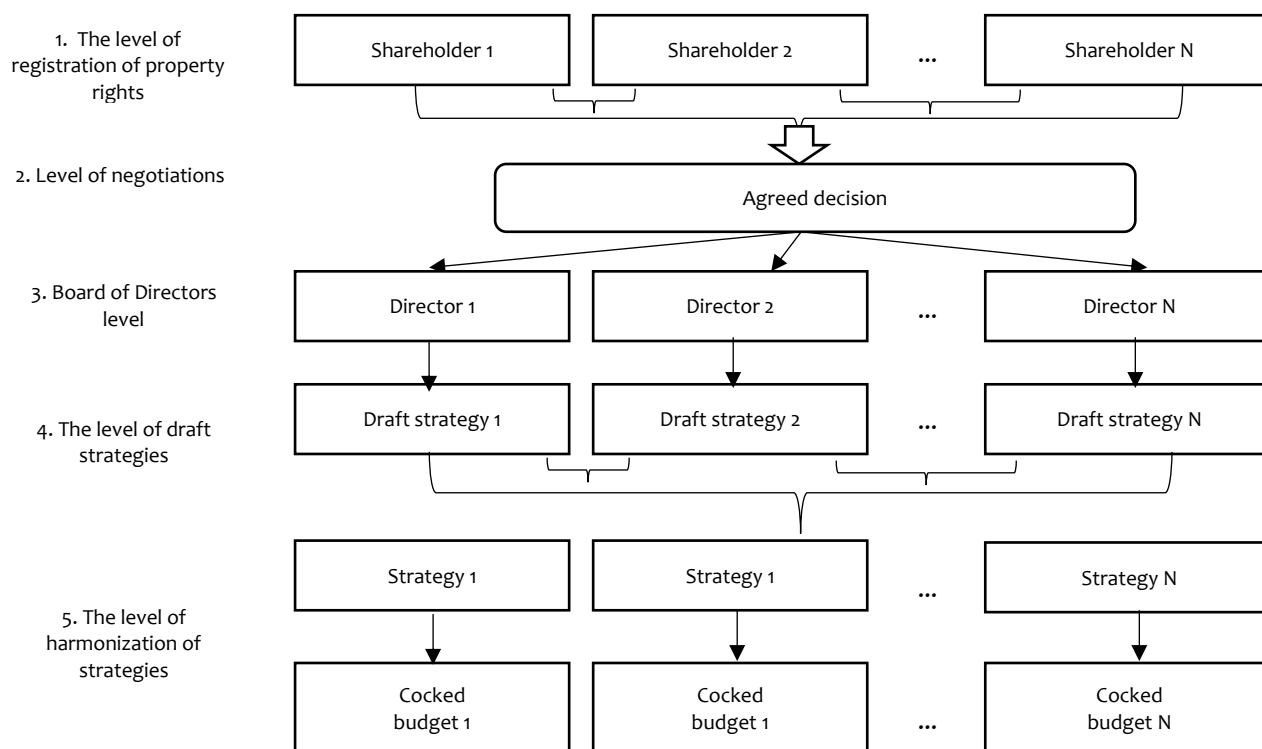
The most difficult decision at the level of interaction of owners is the organization of the process of harmonizing shareholders' priorities and coordinating their interests. In our opinion, no digital technology will allow to get rid of the process of interaction and negotiations of shareholders, therefore, digital corporate management should provide a mechanism for such communication, and not a mechanism for limiting it. In Fig. 4. the logical scheme of the fragment of corporate management of the formation of digital solutions only at the level of shareholders is presented.

After submitting the agreed decision of the owners, the practice of corporate management considers the use of a hierarchical model to be almost unambiguous, however, the presence of a board of directors in a corporation also allows us to say that a decentralized model is needed at the level of the board of directors, despite attempts to organize hierarchical interaction. This conclusion, first of all, correlates with the provision about the independence of the members of the board of directors who develop their strategies, therefore, the first block of hierarchical construction within the corporation is also decentralized.

Table 2: Classification of international corporations by the level of digitalization of business

Characteristics of the corporation	Prospects for entering the digital market	Digital environment	Digital assets	Digital technologies	Digital product
1. Digital leaders	v	v	v	v	v
2. Organizationally receptive and technologically ready corporations	v	v	partially	v	partially under development
3. Organizationally ready corporations	v	v	partially	-	partially under development
4. Those which demand organizational changes and technological modernization of the corporation	v	-	-	-	-
5. Outsider corporations	-	-	-	-	-

Source: Pang, Jiao, and Zhang, 2022; Wu and Chen, 2022

**Figure 4:** Organizational model of a peer-to-peer network in the corporate management hierarchy

Source: Author's own visualization

The implementation of the following stages of the corporate model is directly related to the strategy models developed by the board of directors as a whole for a specific area of activity. Following the general unity of criteria, a strategic model can be more complex than a simple hierarchical implementation. So, for example, at the third level of the model (organization of interaction from top management to executors), a distributed solution based on functional, regional, product and other features is in demand. There may also be a strategic decision related to the creation and development of quasi-markets (for example, regarding the allocation of resources). But there are no known examples of the use of quasi-markets for the distribution of resources within the corporation at the level of large corporate entities, so this decision is rather a theoretical possibility rather than a standard solution (Drobyazko, et al. 2019). If the corporation is forming quasi-markets, they relate to the external model of management decisions, and not to the internal organization of the corporation.

The external and internal environment, which undergo significant changes, are the next in importance in corporate management, after the organization of the interaction structure. Traditionally, corporate management created a specific internal environment, including corporate ethics and culture. The digital space changes this approach somewhat. The environment turns out to be

integrated, that is, internal and external business processes can take place in the same space. Such a vision allows you to design digital business processes once and make them available for cooperation outside the corporation. The integrated external and internal environment fundamentally changes the system view of the object, because both the internal and external environment become the external environment for a digital asset (not just a digitized one), and only the computational processes become internal (Porfirio, et al. 2021). One of the proofs of this was the presence of sparring artificial intelligences that started communicating in English and switched to the newly created own programming language (such an example is bots from Facebook), which, in turn, is a confirmation of the thesis that the entire environment controlled by a person is external in digital technologies. This statement leads to the fact that interaction is changing its forms and content in the digital space, and corporate management should also take this trend into account (Skinner, & Staiger, 2009). It is quite obvious that the top management will defend the division into internal and external business processes as long as possible, including limiting access of shareholders to internal processes, but digital technologies will confirm the inefficiency of such artificial duplication (usually with data distortion) and the need for design business processes accessible both from the internal and external environment in the shortest possible time (Ertz, & Boily, 2019) (Fig. 5).

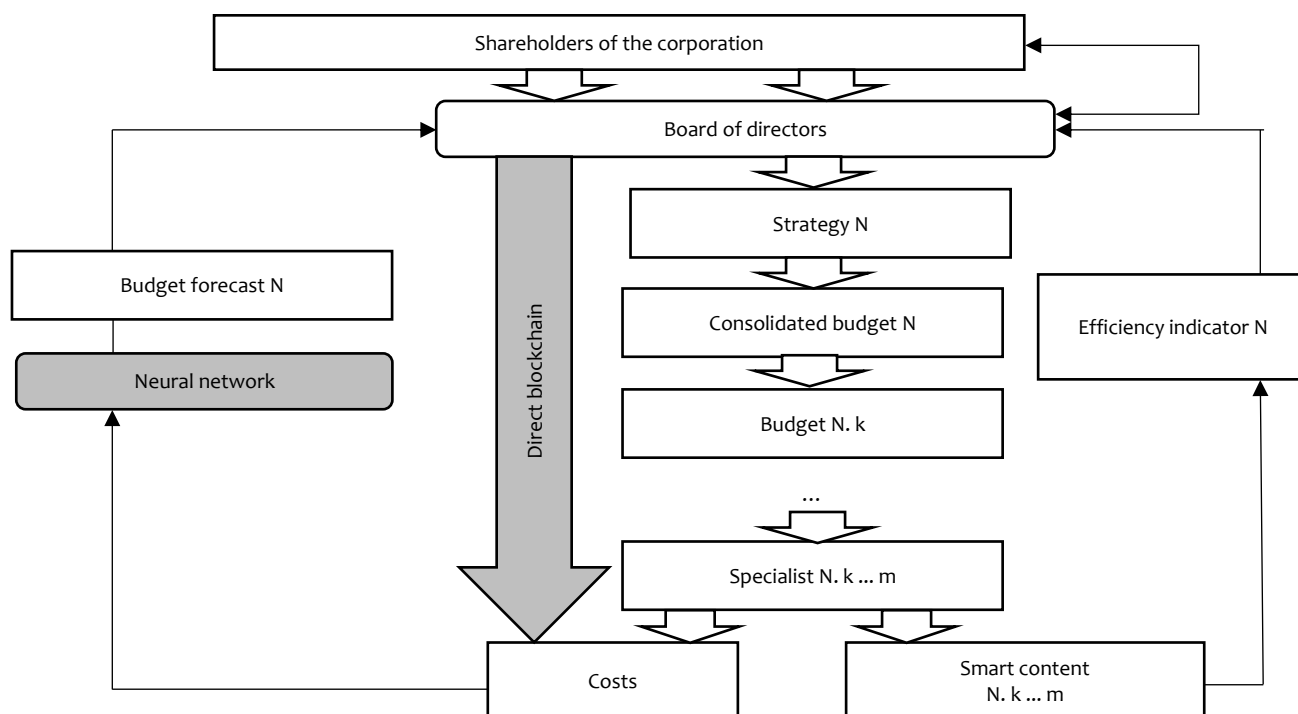


Figure 5: A modified model of the hierarchy on one blockchain for the implementation of a corporate strategy

Source: Author's own visualization

For further management within the corporation, hierarchical management of the interaction between the highest level of management and other employees is sufficient. At the same time, it should be noted that at least three solutions will actually be used, and the most progressive solution will be not only the blockchain of the main activity today, but also a smart contract that will reflect the system of criteria.

More of that, an additional blockchain should be formed on the reverse principle, related to the transparency of activities. However, in the event that a new problem will arise, particularly with information partial asymmetry, so that, the possession of information based on the results of managers' activities will not lead to the emergence of a new class of management decisions, since the levers of influence will not be formed, in this regard, it is necessary to create a forecasting "ideal" blockchain for shareholders and consideration according to management control based on deviations not only from the forecast value of budget execution, but also from the ideal forecast (i.e. in the case of the first scenario (see Fig. 4), thus there is a development of controlling as a new tool - digital controlling). Concerning this approach, it is quite obvious that while approving budgets and performance indicators, discrete values will not be enough, shareholders should move from discrete values to approving processes (predictive blockchain of management decisions) that allow automating the control process. At the same time, the incoming information should be evaluated correctly (processed) in order to eliminate the "temptation" for the shareholder to interfere in the company's management processes at levels below the corporate one - the availability of information will lead to such a temptation. In this regard, it is advisable to introduce an aggregator of deviations (achievements) of the corporation in order to prevent the desire of the shareholder to interfere in the operational activity and violation of the idea of corporate management.

Therefore, the next important changes in the corporate management system should be the reporting model, which ensures transparency of management for shareholders. The existing methodology today is based on the application of two forms of reports: integral (generated for monitoring given indicators) reports and the results of the current state of management accounting, which allow to detect deviations from

the planned course of the process (what is related to controlling) (Sturgeon, 2021). According to the mentioned above, the formation of the so-called counter flow of information reporting should be recognized as the most important. The strategy traditionally formed by the top management is considered to be accepted if it is completed with the adoption of the budget for the implementation of the action plan, which is accompanied by performance indicators. The classic model provides for bringing the budget to each level of execution and in the process of activity by means of controlling (Fig. 6).

The proposed modification of this process in the context of digital solutions includes the following prerequisites: the budget values reported to the division are the basis for developing plans, but are not included in the controlling system, and the controlling procedure is combined with a neural network model of costs, which predicts the most likely value of the budget execution only on senior management levels at the start of each project. In other words, the expenses incurred, being based on the gained experience and training of the neural network, make it possible to perform the forecast of achieving the budget or its deviation. At the same time, the advantages of such a model are most fully revealed in more complex interactions than linear ones. Such a decision is based on the theory of management accounting, which states that incurred costs cannot be adjusted, they must be taken into account as they really are, allowing to build a chain of blocks of value formation or budget execution based on existing accounting principles. At the same time, the discrepancy between the forecast and incurred expenses will also allow to assess the quality of the financial planning of the entire corporation.

Considering the impact of the digital economy on the operational management of a corporation, it should be noted that based on the principles of corporate management, the automation of operational management brings significant needs for changes. Another thing is that the form of presentation of operational processes will be changing during the transformation, but this task should be counted among private tasks that require a new methodological solution (Shelukhin, et al. 2021). Thus, the actual model of corporate management is practically independent of the consequences of the digital transformation of operational activities, with the exception of the content of strategic decisions.

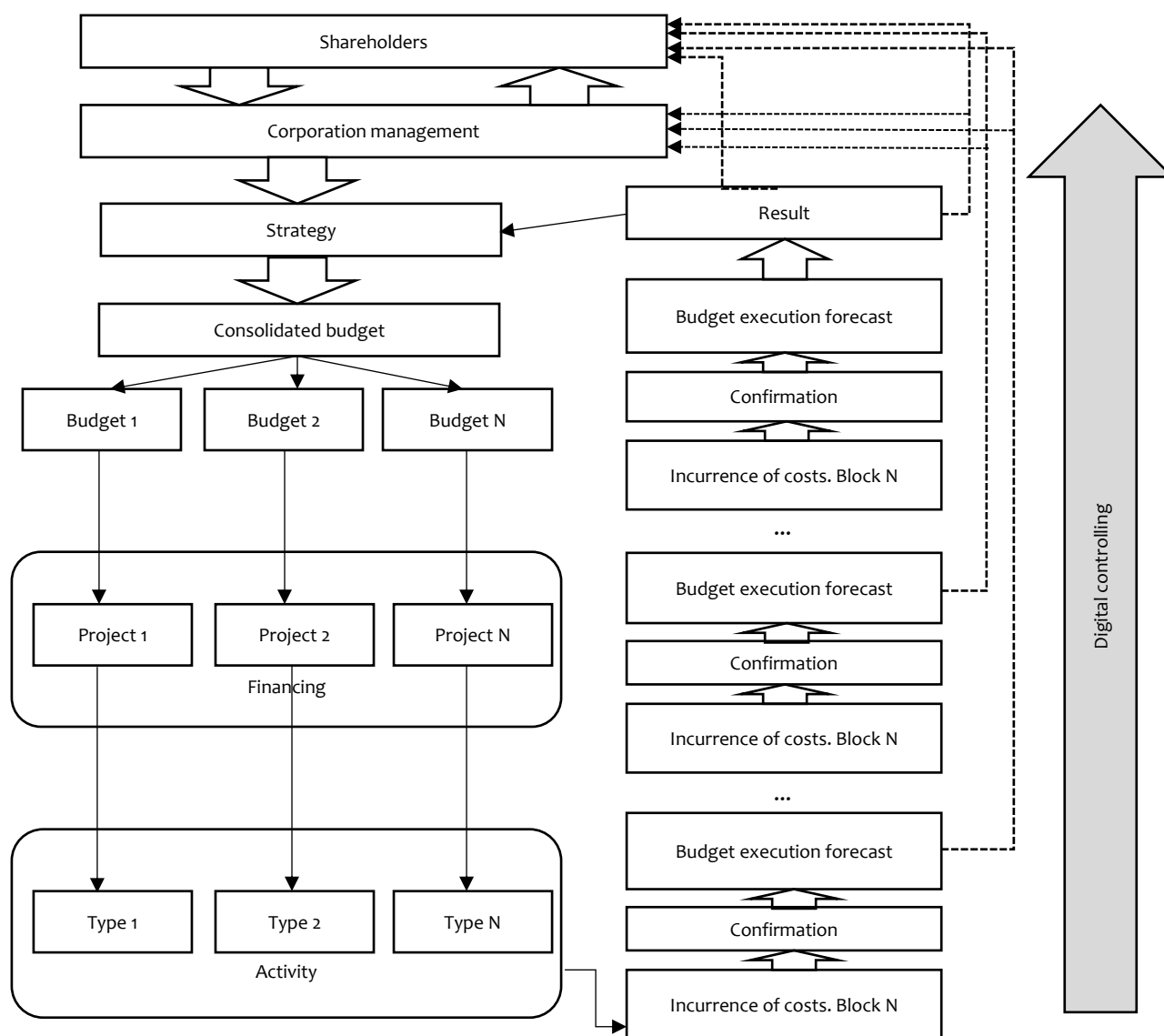


Figure 6: Model of digital corporate controlling based on reverse blockchain

Source: Author's own visualization

The next stage of the development of corporate management in the digital economy should be the consideration of the economic behavior of corporate management subjects in the conditions of digital transformation with the aim of achieving stable cash flow generation, maximizing financial flow and payments to shareholders. On the other hand, the goal of increasing the value of the corporation is traditionally preserved. In our opinion, the modern model of corporate governance should be supplemented with the following goal: the level of generation of digital assets (Fig. 7). The generation of digital assets becomes one of the necessary results, and its absence will lead to the fact that the corporation will be unprotected from the threats of unfriendly mergers and acquisitions later (Rygh, & Benito, 2017).

To submit confirmation, it should be noted that the most modern financial instruments are used to carry out particularly unfriendly mergers and acquisitions, while the owners of the asset use such solutions for protection much less often. Thus, the generation of digital assets will mean their protection with modern solutions, which will lead to crypto-risks reduction and, therefore, to an increase in the value of the corporation. So, at the stage of corporate management a methodology for generating digital assets should be developed in the form of tokens (as an example of the current solution) and ensure their revenue-generating use.

In addition to the purpose, it is worth paying attention to the unit of account. From the point of view of using reserve currencies, this task was almost meaningless, but the formation of cryptocurrencies and the possibility of attracting financing in cryptocurrencies makes it necessary to justify the settlement unit. Such an approach will require the creation of clearing or settlement centers in large corporations in the near future, which transfer the results of operations to those monetary units in which settlements are made. Another approach will lead to a significant increase in risks because of exchange rate differences and a decrease in the efficiency of the corporation's activities.

Thus, the economic behavior of corporate management subjects should additionally include: 1) cryptocurrency financing; 2) generation of additional cash flows based on digital technologies; 3) maximizing the financial flow from digital transformation; 4) additional increase in the value of the corporation from digital technologies; 5) generation of digital assets. Possible modification should be considered for the first four elements and as for the last element - it is inclusion into the corporate management model is to be under consideration.

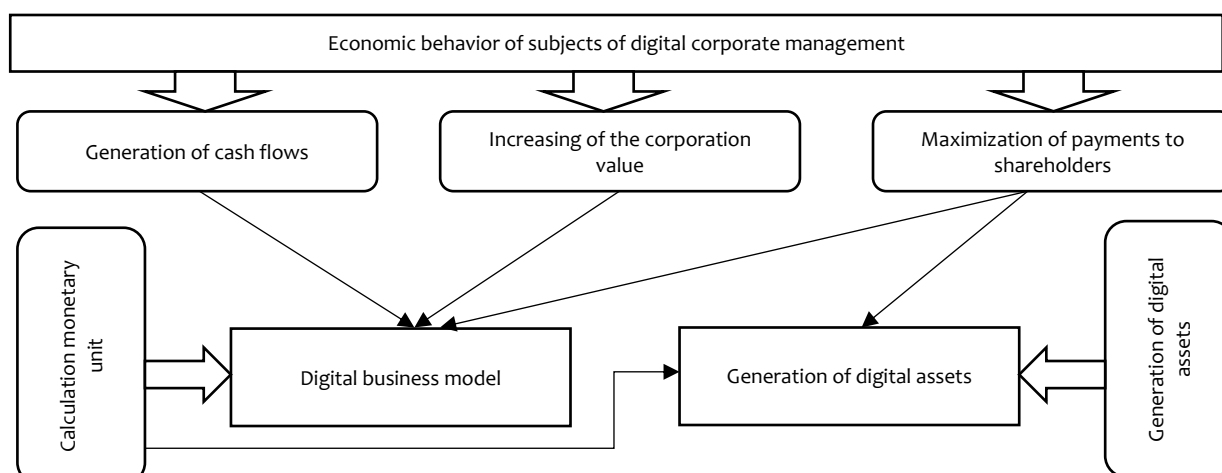


Figure 7: Economic behavior of subjects of digital corporate management

Source: Author's own visualization

Considering the above addition, first it is necessary to pay attention to the increase in the value of the corporation due to digitalization. Studies of modern theoretical and methodological approaches according to the value management of the corporation demonstrate that the evaluation structures are not ready to perceive fully the current and future changes in the economy and society, which are associated with digital transformation. Digital technologies, transforming the technological world, are also transforming economic and managerial relations in society, creating several new centers of influence on the value of corporations. If we wonder about the preservation of the value assessment in the digital world, it is not subject to any doubts, then leaving open questions about the units of measurement of value (in fiat money or cryptocurrencies). The management potential of value models is preserved in the digital economy as well, if the value criterion is perceived for artificial intelligence correctly enough, then the very concepts of the value measurement of corporations require their development in terms of accounting for new phenomena in modern economic relations, as well as in the formation of new models that take the peculiarities of digital transformation into account.

The formation of a digital corporation value can be considered in such a way, basing on three options for possible modifications:

- consider the consequences of digitalization as a corrective factor of the existing business value, and accept a fundamentally new valuation model corresponding to scenario 1 only for newly created digital corporations;
- recognize that digital solutions are not evolutionary, but revolutionary ones in nature, and changes in business interactions are so radical that a fundamentally new model of value creation is needed, which should become the basis of managerial decision-making, corresponding to scenario 2;
- consider that digital consequences do not have radical changes in financial indicators but are an integral manifestation of scientific and technological progress, taken into consideration in the current management accounting system indirectly, which corresponds to scenario 3.

Despite the methodological attractiveness of the first option, the most productive is the second option, based on the study of the business model of value creation. The third option leads to the fact that it will be limited by the pace of manifestation of the real consequences of digital solutions, and if it is applied to assess the value of corporations for a longer time, then the need for its application for the management of the corporation will decrease quickly.

The study of approaches to the formation of criterion evaluations of the functioning of corporations in digital segments demonstrated that the degree of penetration of digitalization into the real sector of the economy has not reached such a level that

would cause a need for the formation of fundamentally new evaluation criteria. Moreover, at present, the process of comparing the new productive forces with the forces of the previous system has been not completed yet, since the advantage of the digital technological system has been not fully proven yet, which allows us to justify the expediency of maintaining the sequence of indicators in order to provide a single basis for calculations and solving selection tasks.

6. Conclusions

The digital economy is defined as the external environment of the functioning of modern corporations, which significantly affects the development of modern society, business, industrial production, state administration, trade and services, and the daily life of citizens. It was determined that the formation of the global digital space becomes the next stage of development in the chain “new industrialization – digitalization” and is caused by the need to ensure the technological leadership of subjects and states based on information communication and end-to-end technologies. These processes are accompanied by the modernization of traditional production and service industries, reformatting of trading-purchasing and logistics activities. It is proven that for a digital corporation: a) the sale of a digital product (or service) becomes the basis for the formation of competitive advantages; b) financial stability management involves assessment and leveling of financial and operational risks, as well as review of the project portfolio; c) cash flows are a decision-making criterion for the development of digital business from the perspective of a stakeholder approach.

It was determined that digital corporations implement new business models, create digital assets and their own digital environment (internal and external), which requires a cost assessment of the effectiveness of their activities. The need to maintain the priority of value maximization for digital business is substantiated, which made it possible to form a logical sequence (from profit to free cash flow) of the selection of indicators for evaluating the results of business operation related to the implementation and distribution of digital technologies in the format of corporate business. While evaluating the income generated, digital corporations should pay special attention to the ratio of tangible and intellectual assets and take into account the contribution of digital platforms to the capitalization of dematerialized assets. It has been proven that in the conditions of the development of the digital economy, both value creation and its destruction can occur, depending on what exactly affected the market valuation. This impact is determined by the market demand for a particular product, taking into account the probability of a decrease in supply (destruction of value occurs) or the level of market demand, taking into account the probability of an increase in demand (value creation occurs).

Three scenarios of the penetration of digital achievements into the basic models of corporate management are proposed as part of the development of the concept of corporate management in a digital

environment. A classification of corporations based on the degree of approximation to the "digital corporation" category has been formed out of 5 groups: digital leaders, corporations organizationally receptive and technologically ready for digital interaction, corporations organizationally ready for digital changes, corporations in need of organizational changes and technological modernization, outsider corporations. A logical scheme of corporate management was developed for the formation of digital solutions at the level of shareholders, including peer-to-peer interaction networks, as well as schemes for hierarchical management of interaction between the highest level of management and other employees using forward and reverse blockchain solutions and smart contracts. An original position according to changing the business model of digital corporate management is presented, which is characterized by a target orientation on the generation of digital assets. It has been proven that the economic behavior of corporate management subjects should be integrated within the framework of digital business models that ensure the growth of the value of an international corporation.

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8. Competing interests

The authors declare that they have no competing interests.

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