Ministry of Education and Science of Ukraine
KYIV NATIONAL UNIVERSITY
CONSTRUCTION AND ARCHITECTURE

Faculty of Construction

Department of construction management

I APPROVE
Head of the department
Doctor of Economics, Prof. Ryzhakova G.M.
"___" _____2024

EXPLANATORY NOTE
FOR THE GRADUATE THESIS
TO OBTAIN THE MASTER'S DEGREE

Topic: " **Transformation of the management system of construction enterprises on the basis of modern development**"

Student of the 6th year, group 073.Man-23
Li Ying
Field of knowledge: 07 - "Management and administration"
Specialty: 073 – "Management"
Specialization Management of organizations and administration

Head: **Doctor of Economics, Professor O.M. Malykhina**

Reviewer _____

Kyiv – 2024

MINISTRY OF EDUCATION AND SCIENCE OF UKRAINE
KYIV NATIONAL UNIVERSITY OF CONSTRUCTION AND ARCHITECTURE

Constructional faculty
Department **of construction management**
Educational and qualification level "**Master"**
Specialty 073 "**Management"**

"I APPROVE"
Dean of the faculty
Ph.D., Professor G.M. Ivanchenko

"_____" _____ 2024

Z A V D A N N YA

for the student's graduation thesis

Li Ying

The topic of the work: «**Transformation of the management system of construction enterprises on the basis of modern development**» and the supervisor of the attestation graduation work, Doctor of Economics, Professor O.M. Malykhina was approved by the KNUBA order dated "___"_____2024_year No.___

2. Deadline for submission of work by the student_____

3. Initial data for work:

scientific domestic and foreign literature on the investigated problem ,Laws of Ukraine, electronic resources, financial reporting of the enterprise.

4. The content of the settlement and explanatory note - a list of issues that need to be developed - (consisting of 3 sections):

section 1- 1. *To characterize the main theoreticians and methodologistsbasic principles of the concept of "management approaches".*

2. Consider the main elements of each management approach.

3. Determinefeatures of the transformation of approaches to management in conditions of digitalization.

section 2*-1. Give a general description of economic activityKyivbuddevelopment.*

2. Conduct an analysis of the main oneselements of management at each stage of the life cycle of the "PUSHA HOUSE" project

section 3 1. *Consider an approach to management based on environmental management in the context of sustainable development*

2. Analyze the risks that may affect the implementation of the PUSHA HOUSE apartment project, develop measures based on basic approaches to risk management

5. List of graphic material:*17 sheets of A4 format (slides) showing the content of research on all sections of the explanatory note to the certification work.*

6. Consultants of sections of certification work

Section	Surname, initials and position consultant	Signature, date	
		issued the task	task accepted
Sections1, 2, 3 conclusions, literature, graphic part	Doctor of Economics, Professor O.M. Malykhina		

7. CALENDAR PLAN

No s/p	The name of the stages of the certification exam robots (AVR)	Termin plementation AVR stages	Note
	The student's choice of the AVR topic, submission of an application to the department and coordination with the academic supervisor		
1	Systematization of materials and preparation of initial data for AVR		
2	Approval of the content (plan) of the AVR, preparation of an individual task		
3	Preparation of the introduction and the 1st section of AVR		
4	Preparation of the II section of AVR		
5	Preparation of Section III of the AVR, conclusions and a list of used sources		
6	Submission of the completed AVR by the student to the academic supervisor		
7	Passing qualifying bachelor's theses to check for the presence of textual borrowings		
8	Finalization of the work, adoption of the department's decision on the admission of AVR to the defense at AEK		
9	Preparation of the presentation (development of options for presenting the content of the research carried out in the AVR, on the sheets of the graphic part) and reports for the defense of the AVR. Agreement with the scientific supervisor.		
10	Final design and review of the work		
11	Preliminary defense of AVR at the department and its approval by the head of the department		
12	Submission of AVR to AEK		
13	Defense of AVR in AEK and assignment of qualifications to graduates		

8. The date of issue of the assignment "_____"_____2024.

Student _____/ Li Ying/

Head of work _____/ Doctor of Economics, Professor O.M. Malykhina /
Head of the department management
in construction_____/ Doctor of Economics, Prof. Ryzhakova G.M./

RESUME(summary)	**Li Ying**

to the student's attestation graduation thesis:			
ZVO	Kyiv National University of Construction and Architecture		
Topic	**Transformation of the management system of construction enterprises on the basis of modern development**		
Educational level	**Master's degree** according to the educational and professional training program		
Faculty	Constructional		
Chair	Management in construction		
Specialty	073 Management		
Specialization	Management of organizations and administration, MO-61		
Head	*Doctor of Economics, Professor O.M. Malykhina*		
Scope of work:	***explanatory note, p.***	***sections***	***Visual and graphic part (A4 format sheets)***
	113 (with literature and appendices)	3	17
Chapter 1. Theoretical and methodological aspects of construction enterprise management	In the **first chapter** of the work, based on the analysis of the literature, the essence of the concept of "management" is summarized and the elements of the basic management approaches are revealed. The features of the transformation of management approaches in the conditions of digitalization are determined.		
Section 2. Analytical aspects and practical assessment "Rushahouse" project from Kyivbuddevelopment	The **second section** covers the general characteristics of the activit yKyivbuddevelopment. An analysis of the main elements of management at each stage of the life cycle of the "PUSHA HOUSE" project was carried out. The management system of the enterprise is considered, taking into account digitalization, and a general assessment of the management of the enterprise is given.		
Section 3. Ways to optimize the effective management of a construction enterprise	In the **third section** of the attestation thesis, an approach to management based on environmental management in conditions of sustainable development was considered, risks that could affect the implementation of the "PUSHA HOUSE" project were analyzed, measures were developed based on basic approaches to risk management, and the reliability of the project even with significant changes in the course investment cycle		
Conclusions on the work:	The effectiveness of production in any field of activity depends to a large extent on the effectiveness of management. A modern management model should represent a holistic integrated approach to management.		
Key words: management, process approach, environmental management, situational approach, risk management, development, system approach			

Compiler: _____ / Li Ying /

Supervisor: _____/ Doctor of Economics, Professor O.M. Malykhina /
"___" _____ 2024

CONTENT

INTRODUCTION

Relevance of work. Today's dynamic business environment forces businesses to be adaptive to ensure they respond to any challenges. Being adaptive means having a number of such basic characteristics as the speed of reaction to changes and the possibility of their use, flexibility, efficiency, economy, mobility (maneuverability), reliability, competence, innovation.

In the current conditions of Ukraine (first of all, in commercial housing construction, which remains one of the few branches of profitable real investment in the crisis), the developer company acts as a leading institutional participant, regulator of the environment and administrator of resources in construction development projects.

The effective management of the company's activities depends on certain aspects, which can be attributed to: the construction of management based on the principles of balance, manageability, effectiveness, efficiency, modernization, transparency and openness, dynamism, which will contribute to ensuring effective control over all phases of the production process in the company; choosing the optimal project financing model; minimization of cost of funds and time for project implementation; recruitment and motivation of personnel.

Nowadays, there is a "management revolution" in the theory and practice of management, which is connected with the transition of society to the information stage, the stage of globalization. The old (rationalist) management paradigm is being replaced by a new (informal) one, which can be characterized as updated, empirical or individualistic, "informational". In other words, the change in the paradigm of modern management is connected with a new understanding of the subject of management.

Today, in order to adequately respond to changes in the external and internal environment of the organization's management, a toolkit is needed, which would make it possible to systematically analyze the past, objectively diagnose the present, and effectively build the future.

The formation of an effective management system occurs thanks to scientific approaches that correspond to the chosen management concept.

Approaches in management are the principles, styles, methods, forms and means of management formed on the basis of practice, scientific knowledge, the level of development of the firm and historical conditions used in management with a certain ideology and consequences. Each of the scientific approaches has its own ideology, consequences and historical conditions of development. All of them are used in management at different levels of professionalism of managers and staff, levels of development of the firm, depending on the socio-economic and political system of the country.

Analysis of the latest research. Such scientists as: M. Gvozd, K. Didur, O. Yefimova, O. Zakharkin, M. Kalintenko, M. Kamenova, A. Kasyan, Z. Koval, I. Kononova, O. Kuzmin, L. Malik.

The purpose of the certification workthere is a scientific substantiation of the management approaches used in enterprise management, taking into account modern trends and the changing external environment.

Tasks of this work:

1. To characterize the main theoretical and methodological foundations of the concept of "management approaches".
2. Consider the main elements of each management approach.
3. Determine the features of the transformation of approaches to management in the conditions of digitalization.
4. Give a general description of the economic activity of Kyivbuddevelopment.
5. To conduct an analysis of the main elements of management at each stage of the life cycle of the "PUSHA HOUSE" project.
6. Consider an approach to management based on environmental management in the context of sustainable development

7. Analyze the risks that may affect the implementation of the "PUSHA HOUSE" project, develop measures based on a process approach to risk management.

The object of research are approaches to the management of the construction enterprise Kyivbuddevelopment and management of all stages of the project life cycle of the "PUSHA HOUSE" apartment project.

The subject of research is a set of theoretical-methodological, scientific-methodical and practical principles of management at the enterprise.

Research methodology and methods. The basis of writing the final qualification work was the methodology and work of both domestic and foreign scientists who researched the concept of management approaches, determined their role in the process of enterprise management and developed measures to assess the effectiveness of their application.

In this work, the following research methods were used to solve the tasks and achieve the set goal: morphological analysis, generalization and scientific abstraction - when clarifying the essence of the definition of "management approaches", statistical methods of observation, grouping - to determine the state and trends of the enterprise's development and the parameters of its financial management resources, system analysis, formalization and economic modeling - to develop the main directions of improving approaches to enterprise management in modern conditions.

Information base legislative acts of Ukraine, official reporting documentation of the enterprise, works of foreign and domestic scientists, Internet resources, as well as own research and work became the basis for writing the final attestation work. All mathematical calculations are performed thanks to the use of modern computer technologies.

The elements of scientific novelty in the qualifying final work are:

- specification of construction enterprise management approaches in modern development.

- a theoretically grounded and developed model of construction enterprise management based on process digitalization.

Practical significance of research resultsis that the proposed conclusions and recommendations regarding the improvement of the enterprise management mechanism in the conditions of digitalization of the economy can be used in the practical activities of construction enterprises, in particular, LLC "Kyivbuddevelopment".

SECTION I. THEORETICAL AND METHODOLOGICAL ASPECTS OF MANAGEMENT OF CONSTRUCTION ENTERPRISES

1.1. Scientific applied approaches to enterprise management, historical aspect

The modern market environment is characterized by a high probability of drastic changes, unpredictable development of crisis phenomena, significant complication of forms of competition and its aggravation. Under these conditions, the preservation of the organization's competitiveness largely depends on the quality of the built management system, on its potential opportunities for improving the processes of planning, motivating, organizing, controlling and regulating the organization's activities in response to dynamic changes in the external environment[1, c.95].

It should be emphasized that the paradigm of management is constantly changing, updated in accordance with the development of socio-economic conditions of production, reflecting at each stage the leading ideology of effective management, influencing practical managerial activity. The management paradigm is a system of concepts and ideas related to the theory and practice of management, which is formed on the basis of the study, analysis and generalization of the realities of reality and changes in accordance with changes in the external and internal environment of organizations.

Management (as a type of social practice) in one form or another has always existed where and when there was a need to organize joint activities of people. Management as a system definition was formed during the long evolution of its development. In view of the system and integrity, it is advisable to consider the main aspects of the evolutionary path of management through the prism of historical, philosophical, worldview, and technological contexts (Table 1.1.)

Table 1.1.

The main aspects of the evolution of management

The main aspects of the evolution of management	Content (key accents)
Historical	Reflects the trajectory of management changes against the backdrop of changes in society, economic practices, and features of the economy.
Philosophical and worldview	It reflects the value parameters of activity, the ideological basis, on the basis of which the mission is formed, the purpose, goals and new tasks appear, and it confirms the spread of humanistic values.
Technological	Specifies new forms, methods, tools and mechanisms of management.

Source [2]

So, the modern paradigm of management was formed on the basis of dialectical development, analysis and selection of the most effective management technologies at all stages of its formation, taking into account new socio-economic realities and the development of management as a science aimed at the production of new knowledge

Worldview changes in society as a reflection of the processes of social transformation under the influence of new cultural trends, globalization explosions, the development of civil society outline the philosophical and worldview section of management. All processes and phenomena occur in a certain historical time, therefore the historical aspect reflects the acquisition of new features of management and its trajectory of changes in the context of changes in society, business practices, and features of the economy. In such a holistic way, the evolutionary process of management is taking place and a qualitatively different model of it is gradually emerging

In the course of the evolutionary transformation of world management thought, the term "management" acquired a significant content expansion (table 1.2.).

Table 1.2.

Systematization of the author's approaches to the interpretation of the essence of the concept of "management"

Author	Definition
I.Ф. Komarnytskyi	Management is a purposeful influence on the collective of employees or individual performers in order to fulfill the tasks and achieve the defined goals of the organization.
L.I. Nechayuk, N.O. Beef	Management is an integrative process by which professionally trained specialists form and manage organizations by setting goals and developing means to achieve them.
F.I. Hop	Management is a — specific type of activity aimed at achieving certain foreseen goals by a production and economic organization that functions in market conditions, through rational use its material, labor and financial resources.
V.Ya. Malinovsky	Management is an independent type of professionally carried out activity aimed at achieving certain goals in the course of any economic activity of an organization operating in market conditions through the rational use of financial, material, technical and labor resources.
G.V. Shtokin et al.	Management is a certain ability to achieve an appropriate goal through the use of work, intelligence, abilities, motives of behavior, activities of other people, organization.
B.P. Budzan	Management is the process of managing resources and people, which includes certain goals, planning, organization, leadership and control aimed at achieving the ultimate goal; this is an activity aimed at the implementation of this process; this is a certain stratum of people professionally engaged in this activity and concentrated in the management apparatus; it is the art of management; it is a branch of science, that is, a theory, a sum of knowledge accumulated over the entire history of the development of society, which is presented in the form of concepts, approaches, principles, methods and methods.
O. E. Kuzmin, O. G. Melnyk	Management is a type of management and means management of people (employees, collectives employees, groups, organization, etc.).

Source[2-8]

M. M. Martynenko was distinguished by an interesting interpretation, he defines management as a set of types of management activities aimed at the efficient and effective use of the entire set of resources [9]. He revealed the content of the concept of "management" with the help of a picture (Fig. 1.1).

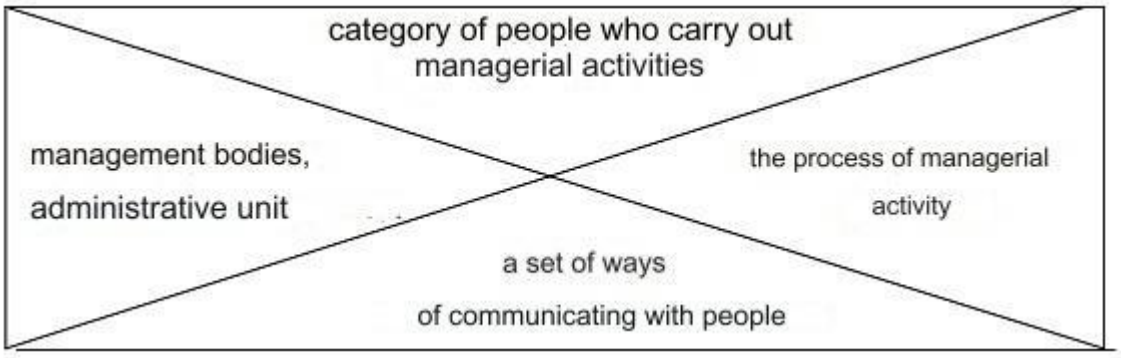
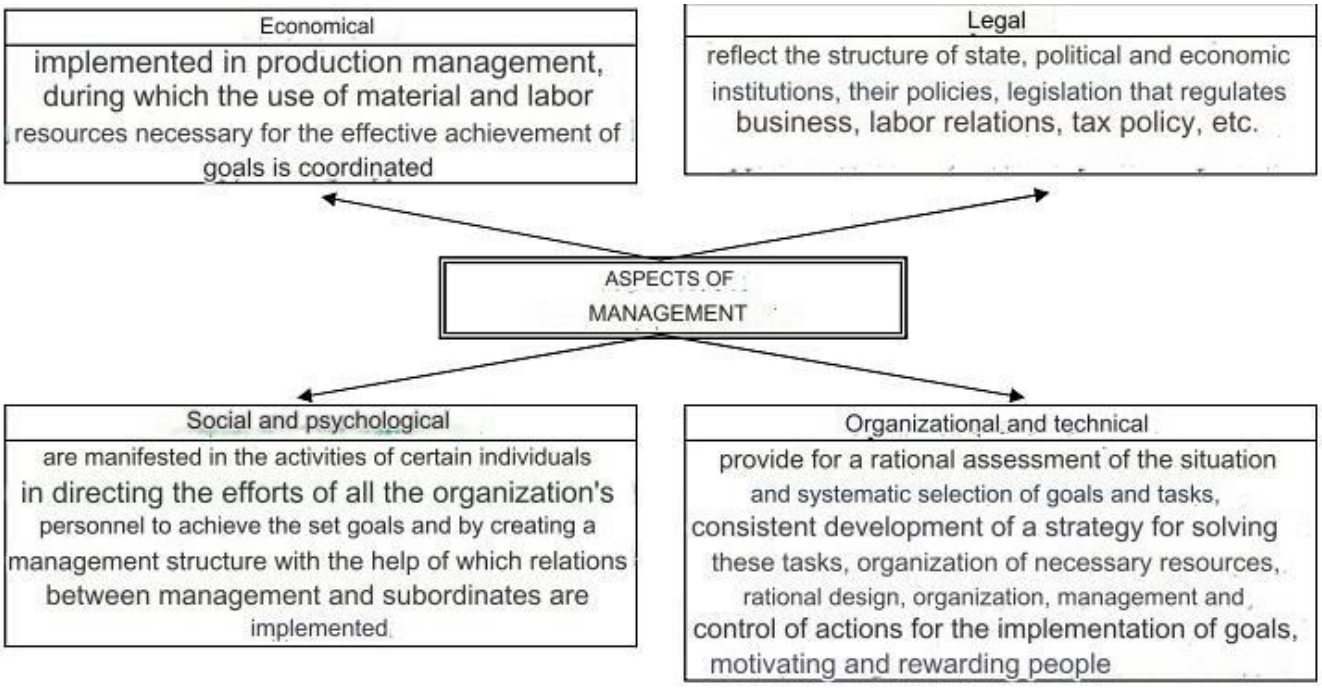


Fig. 1.1. Content of the concept of "management"

Source[9]

Management as a social institution of modern society covers all spheres of its life activities, which allows us to consider this phenomenon in a broad sense, identifying it with an innovative type of organizationally flexible, motivational management, which is carried out on a professional basis and plays a key role in achieving the most effective activity of the organization aimed at realizing economic and social needs of people [9, p.103].

Management is traditionally associated with the market of goods and services. Where there is an organization, there is a need for management. Depending on the type of organization, it can have a different form and specific characteristics (management in politics, in the economy, in culture, etc.), however, the most principled basis of management is the same everywhere. This is precisely the content of management, which is revealed in the totality of its aspects (Fig. 1.2).



Rice. 1.2. Basic aspects of management

Source[11]

Considering the evolution of management, we note that throughout the history of human society, there was a practice of management that was not the same in different periods. As a scientific discipline, management emerged only at the end of the 19th and the beginning of the 20th centuries.

Management is the science of how to succeed in managing people, how to create and improve organizations, to ensure their development and achievement of their goals in the most effective ways with limited production factors, as a process of managing the organization's economic activities.

Management is an independent branch of knowledge, a science that has its own object, subject and subject, laws, principles, as well as a certain methodology and conceptual and categorical apparatus. Management has its own source of knowledge - practice, and, in addition, it is replenished with knowledge from various disciplines, without which it is unable to develop.

Management cannot be considered by us as an autonomous activity aimed at itself. They always manage (manage) something. This "something" is the real sector of the economy and the special (real, specific to this sector) functions associated with it (Fig. 1.3.)

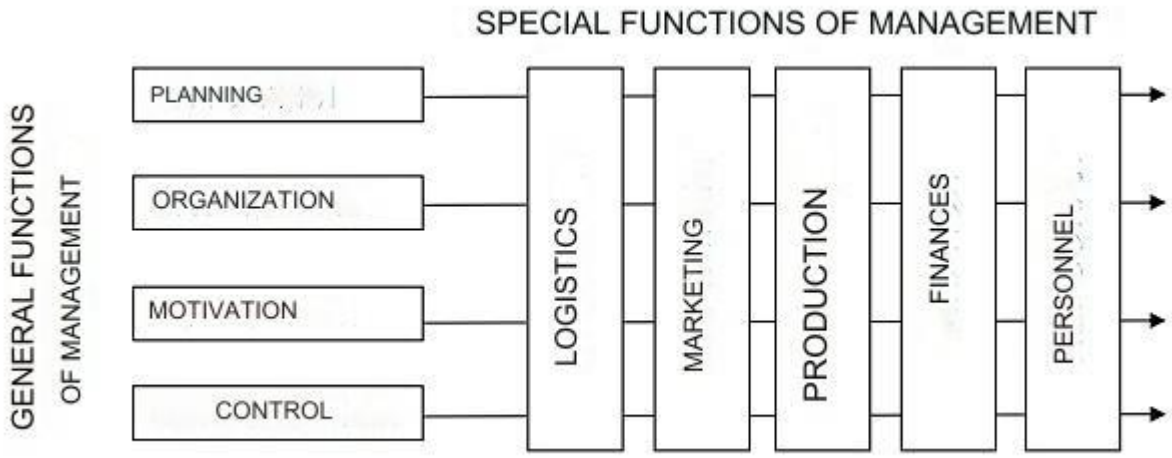


Fig. 1.3. Connection between special and general functions of management

Source[12]

When considering the manager's activities based on the analysis of the functions performed by him, it is important to remember that management is a process, that is, a set of interrelated and long-term actions, as it is presented in fig. 1.4.

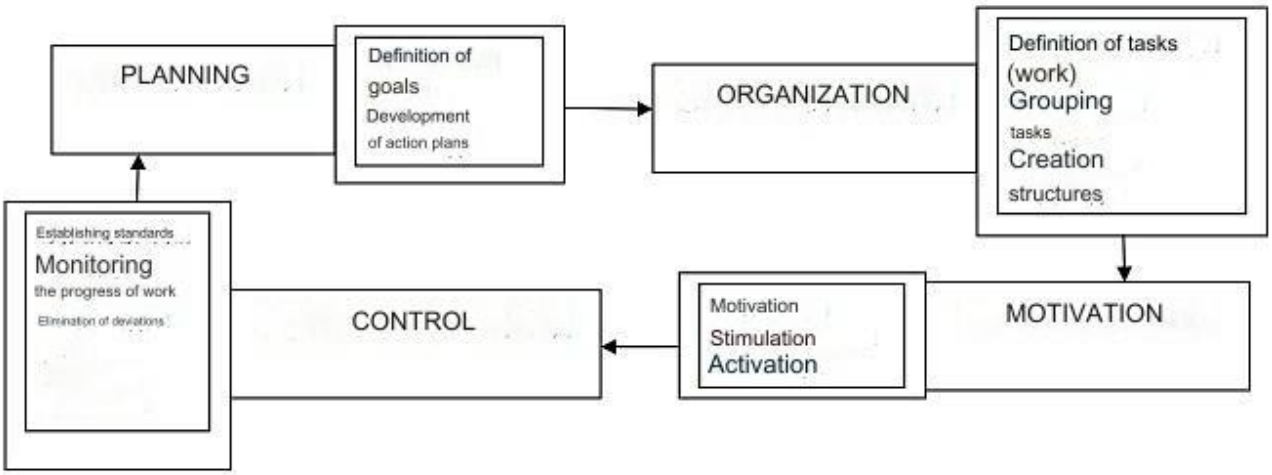


Fig. 1.4. Planning process in the organization

Source[12]

The general functions of management, as types of activities of managers, are detailed in special functions and are standardized and structured with the help of methodological functions. management entities in order to achieve the defined goals (Fig. 1.5.).

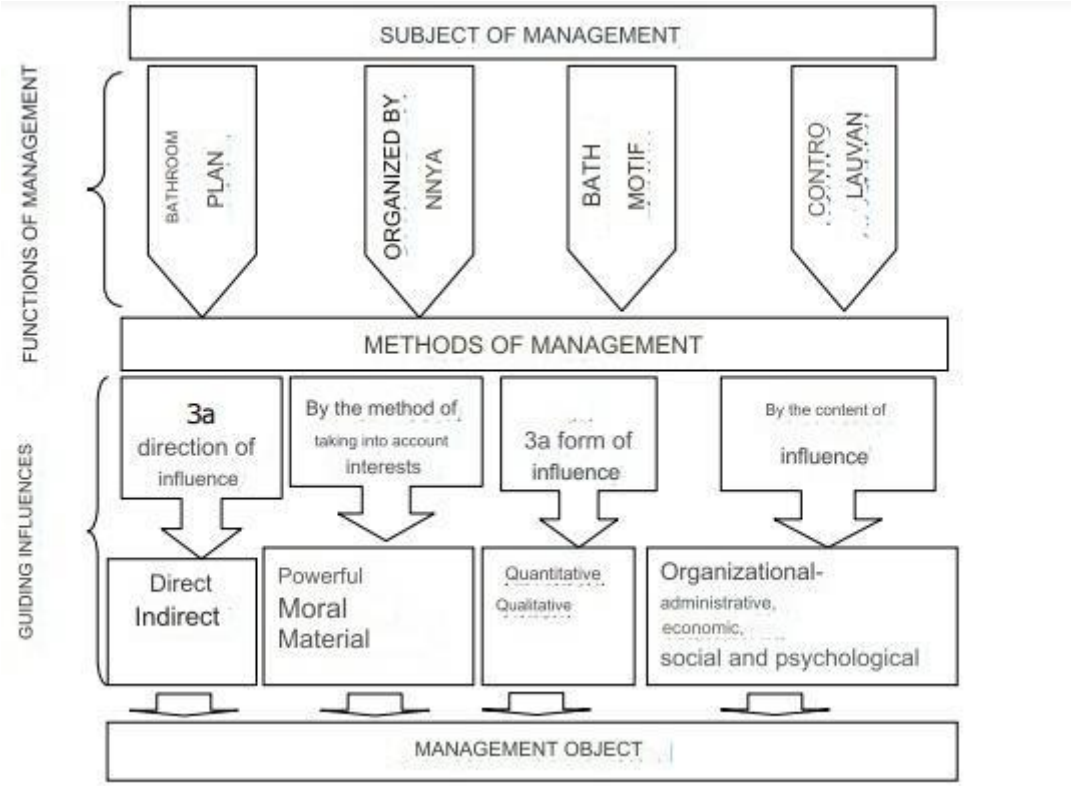


Fig. 1.5. Relationship between management functions and methods

Source[12]

According to scientists in the field of management, the objects of management — technology and people — are influenced by successes in understanding problems related to management by many other sciences, such as mathematics, engineering science, psychology, sociology, anthropology.

Management models are a simplified reflection of reality and help to understand its complexity by considering alternative points of view on the problem being studied. The authors of most management models developed their schemes independently, in different contexts, pursuing different goals, so the relationships between such models are very difficult to detect. In this sense, Robert Quinn's model of "competing values" is of some interest, which makes it possible to connect the main theoretical developments and the relationships between them into a single scheme (Table 1.3.)

Table 1.3.

Management models in the concept of competing values

Characteristics/ model	Rational goals	Internal processes	Human relations	Open systems
Main representatives	F. Taylor, L. and F. Gilbraith	A. Fayol, M. Weber	E. Mayo, M. Follett, C. Bernard	E. Trist and C. Bamforth, J. Woodworth, T. Burne and J. Stelker, P. Lawrence and J. Lorsch, T. Pieter and R. Waterman
Performance criteria	Productivity, profitability	Stability, continuity	Obligation, morality, unity	Ability to adapt, external support
Means/goals	Clear leadership leads to productive results	Routine leads to stability	Engagement leads to responsibilities	Continuous updates guarantee external support
Special attention	Rational analysis, measurement	Determination of responsibility, documentation	Participation, coherence	Creative problem solving, innovation
The role of the manager	Leader and planner	Observer and coordinator	Mentor and assistant	Innovator and mediator

Source[13]

It should be noted that no model provides a complete solution to the problems, so in practice it is useful to combine them, to use the value of each.

The effectiveness and quality of management are determined by the validity of the methodology for solving existing problems, that is, approaches, laws and regularities, principles and methods. Without a well-founded theory, practice is imperfect.

Analysis of the theory and practice of economic management of various objects made it possible to establish the need to apply scientific approaches to management, which characterize one of the aspects of management.

Theoretical models of organizations as open systems, based on systemic and situational approaches, gained the greatest recognition in the recent period, due to the increase in the variability of external factors (Fig. 1.6.)

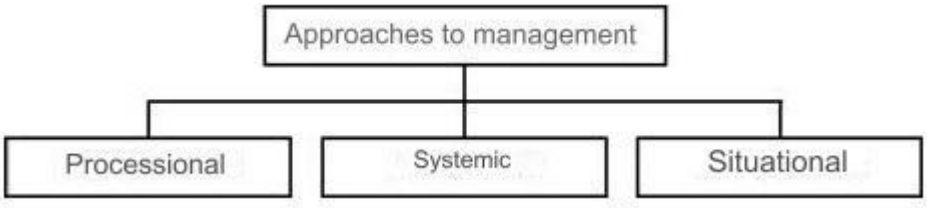


Fig. 1.6. Approaches to management

Source[13]

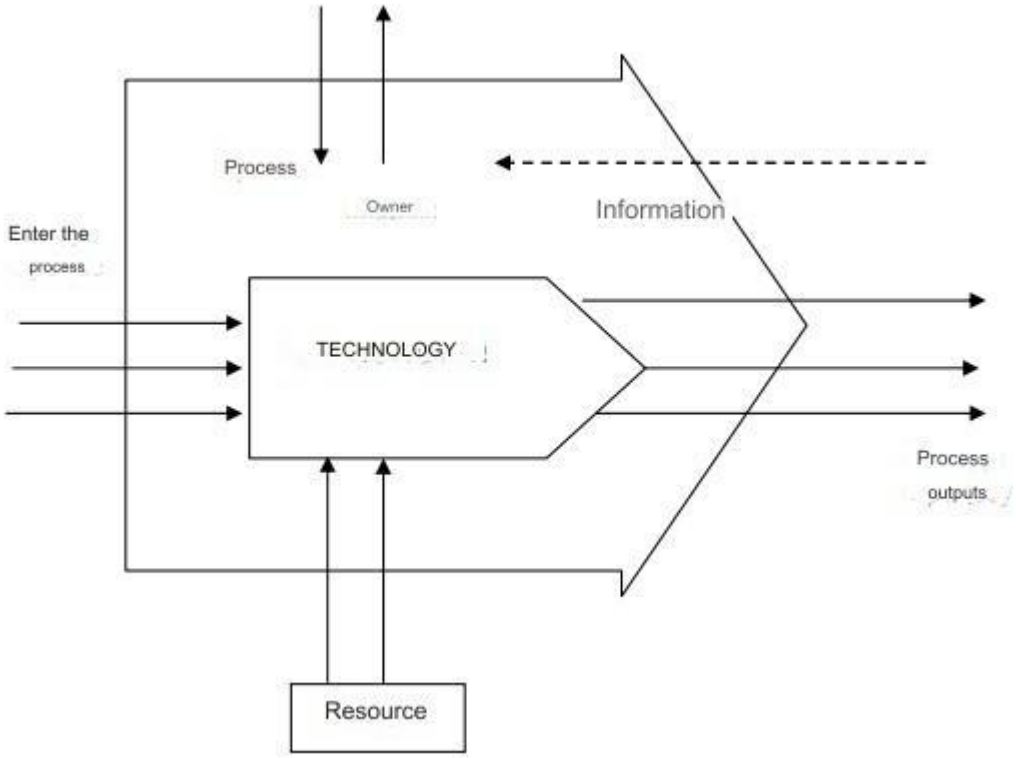
The precessional approach considers management as a process of continuous interrelated actions or functions. The total sum of all management functions is the management process.

The content of management as a process is revealed in its functions, which are separate types of activity. Henri Fayol first divided the management process into five primary functions. According to him, "to manage means to predict and plan, organize, manage, coordinate and control". Today, most authors distinguish four main functions: planning, organization, leadership and motivation and control.

Process approach – obtaining the desired result through the management of activities and relevant resources as processes.

The process approach to management ignores the organizational structure of the management of the organization with its inherent consolidation of functions by individual divisions. With the process approach, the organization is perceived by managers and employees as an activity consisting of business processes aimed at obtaining the final result. The organization is perceived as a network of business processes, which is a set of interdependent and interacting business processes that include all functions that are performed in the organizational units. While the functional structure of the business determines the capabilities of the enterprise, establishing what should be done, the process structure (in the operating system of the business) determines the specific technology for the implementation of the set goals and tasks, answering the question of how to do it [14]

According to the International standard ISO 9001:2008 "Quality management systems. Requirements", a process approach is any activity that uses resources to transform "inputs" into "outputs".



Rice. 1. 7. General scheme of the process approach to management

Source[15]

Each process does not exist by itself, but performs certain functions in the organization and is under the control of its top management. As a rule, process owners are officials or collegial management bodies that have at their disposal the resources necessary for the implementation of the process and are responsible for the outcome of the process.

Forming the management of the organization on the basis of the methodology of the process approach, the emphasis is not on hierarchical subordination in functional units, but on the creation of project teams, where the owner of the process is determined, who is responsible for the course and result of the entire process as a whole, including the work of various people involved in the process functional divisions. The role of the process owner is not to manage the daily routine of each of the constituent parts of the process, but to manage the creation of added value in the final product of the process for consumers of the process (Fig. 1.8).

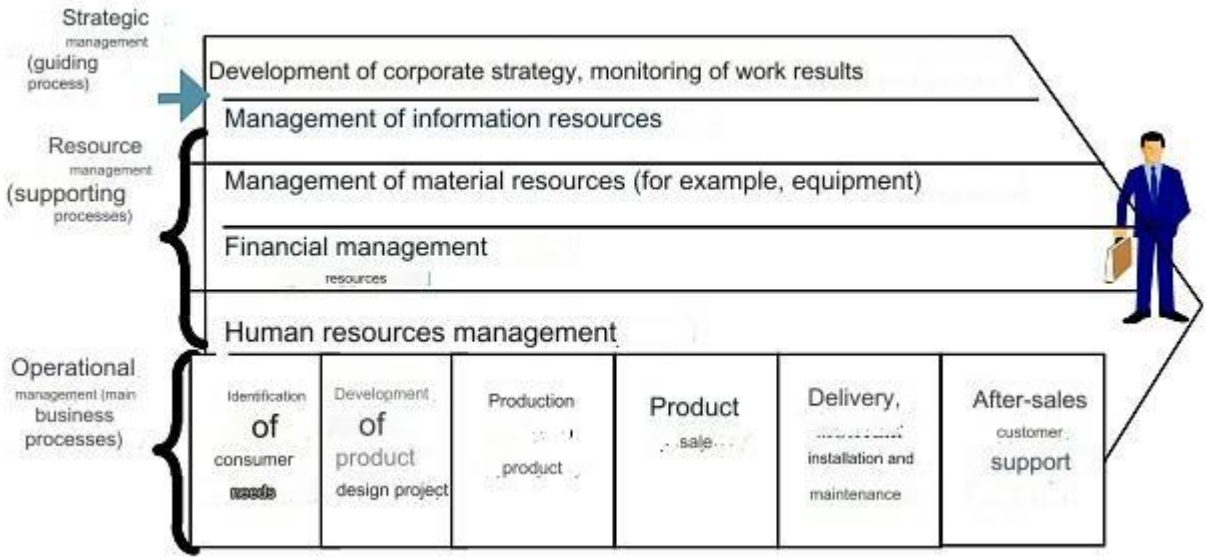


Fig. 1.8. Organization management as a chain of business processes (M. Porter's model)

Source[16]

The main advantages of the process approach are:

- coordination of actions of various divisions within the framework of the process;
- orientation to the result of the process;
- increasing the effectiveness and efficiency of the organization's work;
- transparency of actions to achieve the result;
- increasing predictability of results;
- identification of opportunities for purposeful improvement of processes;
- elimination of barriers between functional units;
- reduction of unnecessary vertical interactions;
- exclusion of unclaimed processes;
- reduction of time and material costs [17].

The algorithm for applying the process approach is shown in Fig. 1.9.

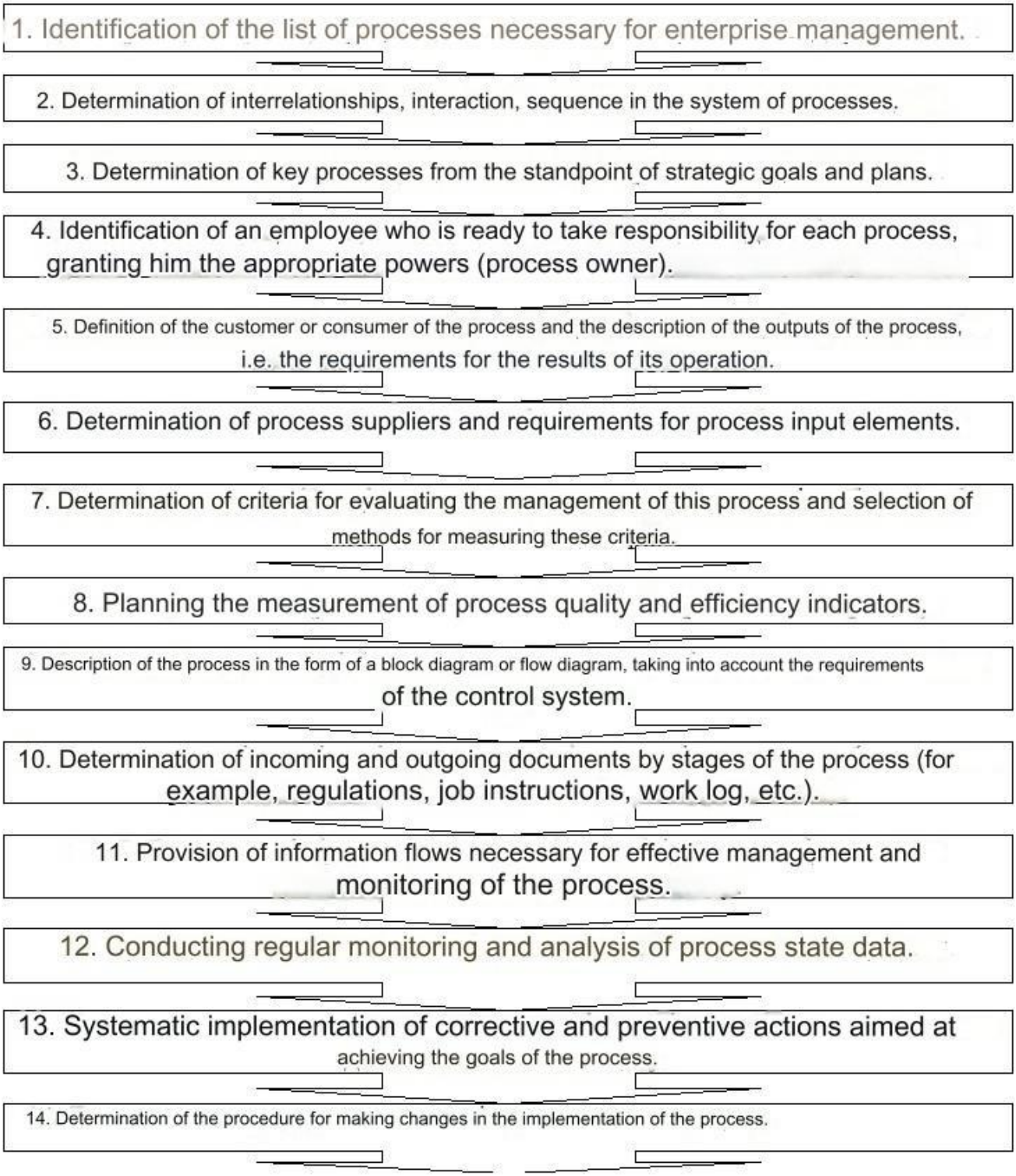


Fig. 1.9. Algorithm of application of the process approach

Source[16]

The process approach is widely used today in the planning of organizational structures, the distribution of competencies (management functions) within the organization, the establishment of cooperation between various units, and in ensuring the control of the execution of work at all stages of the implementation of production tasks.

The system approach uses the theory of systems in management, that is, the study of the complex through the search for the simple. Each school of management focused on one of the organization's subsystems. The behaviorist school was mainly concerned with the social subsystem. School of scientific management — mostly technical subsystems. Systematic methodology made it possible to integrate the contribution of all schools that dominated at different times in the theory and practice of management, not opposing, but complementing and supplementing them.

A systematic approach in the 1960s and 1970s. becomes a universal ideology of management, and system analysis is a universally recognized tool. The systemic approach considers processes and phenomena in the form of a set of elements, structures, relationships and interconnections. A systematic approach is not a set of clearly defined principles, guidelines are primarily a way of thinking about organization and management.

All organizations are systems. Since people are, in a general sense, components of organizations (social component), along with the equipment used to perform work, organizations in management are often called sociotechnical systems (Fig. 1.10).

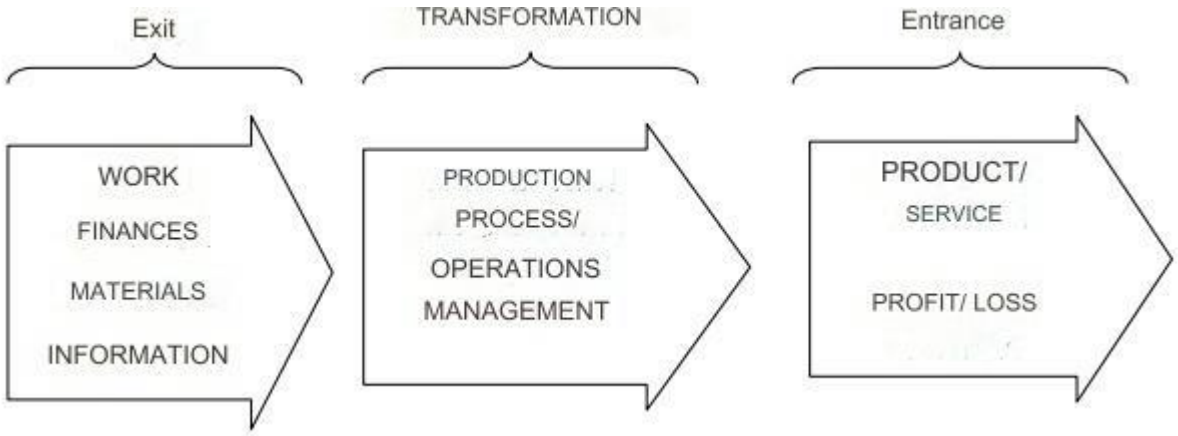


Fig. 1.10. Diagram of an open socio-technical system

Source[17]

Understanding that organizations are complex open systems helps explain why each school of management has proven to be applicable only in limited settings. Proponents of each school tried to focus their attention on a certain subsystem of the organization (social, technical, or otherwise).

No system approach school has seriously considered the influence of the external environment on the organization, although it is a very important component of the organization's work.

Currently, there is a widespread opinion that external forces can be decisive for the organization, for its effectiveness, for choosing certain means from the management arsenal that will give the desired result [15, p.35].

The basis of the system approach in management is the idea of decomposition and integration of the system, its subsystems and elements in the analysis of the relationship of the organization with the external environment and the adoption of management decisions that provide a comprehensive approach to its functioning and obtaining the desired result, taking into account the combined influence of external and internal factors .

The main principles of the system approach:

1. Integrity, which allows considering the system simultaneously as a single whole and as a subsystem of higher levels of management.

2. Hierarchy of the construction, i.e. the presence of a set (at least two) elements that are located on the basis of the subordination of elements of a lower level to elements of a higher level. Implementation can be traced in the interaction of two subsystems: the controlling (controlling entity) and the controlled (controlling object).

3. Structuring, which allows analyzing system elements and their relationships within the given organizational structure. According to the principle of emergence, the process of functioning of the system is determined not so much by the properties of its individual elements, but by the properties of the structure itself.

4. Multiplicity, which allows the use of a set of cybernetic, economic and mathematical models to describe individual elements and the system as a whole.

5. Emergence (systemic effect, systemicity) – the presence of any system of special properties that are not inherent in its subsystems, blocks or sum of elements, not connected by special system-forming connections.

In the 1980s, one of the most popular theories within the system approach was the concept of "7S", developed by E. Athos, R. Pascal, T. Peters and R. Waterman. "7S" are seven interdependent variables whose names in English begin with the letter "S":

strategy, structure, management system, personnel, employee qualifications, organizational values, systems and procedures of social technology.

Changes in one variable through the system of connections affect the state of others, so maintaining balance and harmony between them is the main task of modern management.

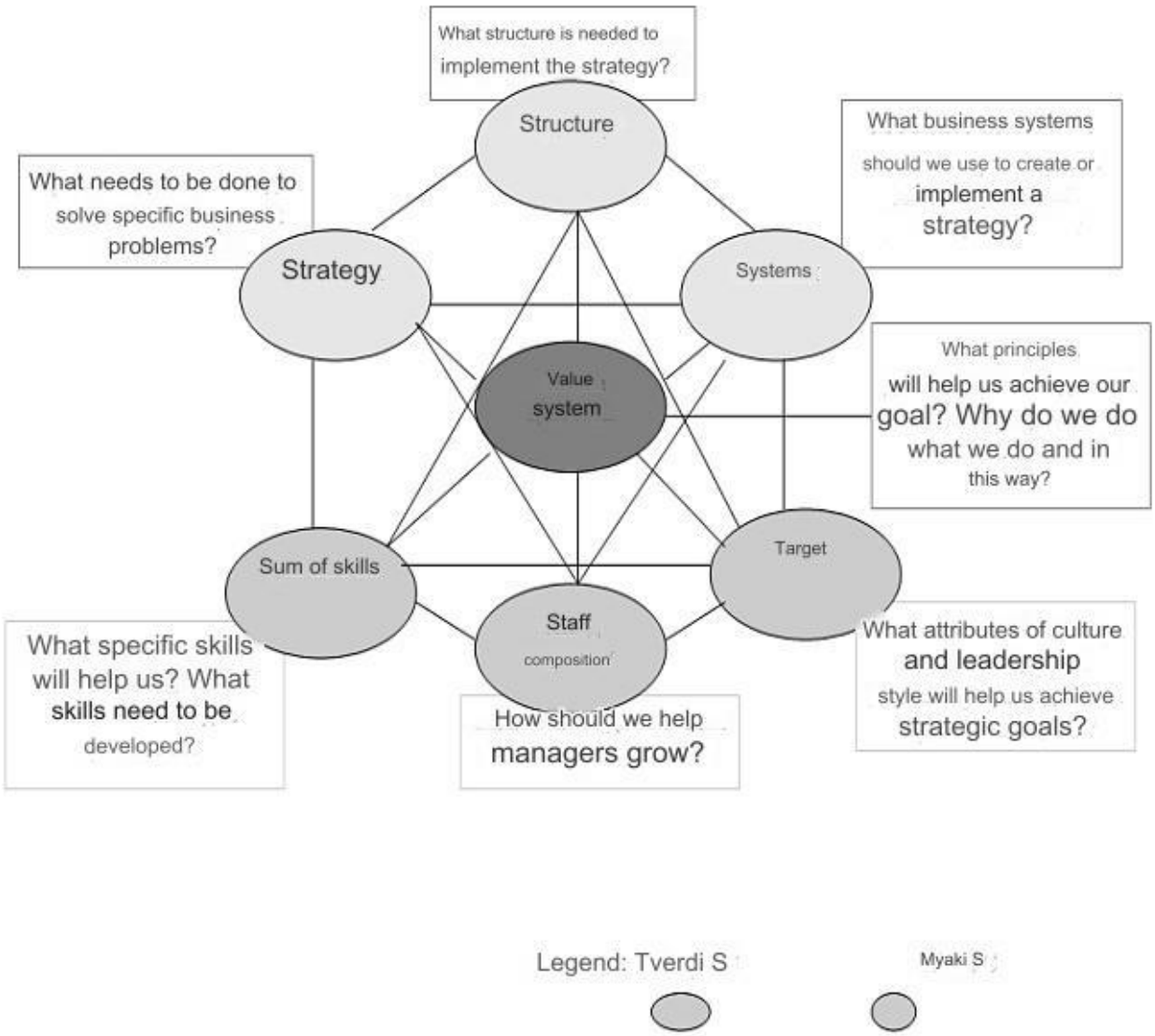


Fig. 1.11. Scheme of functioning of the 7-S management system model

Source[19]

The main differences between hard and soft system approaches are shown in table 1.4.

Table 1.4.

The difference between hard and soft system approaches

Rigorous systematic approach	Soft systematic approach
The problem has a certain solution	There are too many problems to be solved
The problem has a list of achievable goals with clear criteria	Achievement of goals is difficult to measure and it is difficult to objectively evaluate the result
The problem answers the question "How?"	The focus of the problem is directed not only to the question "How?", but also other important questions "What?", "Why?"
The problem has deterministic complexity	The problem has an informal complexity
Probably that it is possible to determine the parameters of failure. The solution	It is difficult to predict failure parameters
to the problem does not depend on the value system	Solving the problem depends on the value system and professional mentality of the staff
Logical and sequential connections	Intuitive-metaphorical connections

Source[19]

The main goals of the organization when using a system approach to management are [18]:

- elimination of inconsistencies in the goals of individual divisions;

- ensuring unidirectional actions of units;

- search for critical success factors of the organization;

- ensuring the stability of the organization's functioning; - ensuring the adaptability of the organization's work.

Situational approachis an approach that recommends using the possibilities of direct application of science to specific situations and conditions in management. The central point here is the situation - a specific set of circumstances that significantly affect

the organization at the moment. The behavior of people in problematic situations is the most important aspect of situational management.

The reaction of the team, the reaction of the management to certain circumstances, aspects of the production activity of the enterprise during the period of maturation, manifestation, liquidation and after the crisis. An important feature of management training is that they all, to a greater or lesser extent, proceed from the presence of the so-called systemic effect, which is expressed in the fact that the whole is always qualitatively different from the simple sum of its constituent parts.

A simple system is focused on achieving one goal, while a complex system strives to achieve several interdependent goals. Since all organizations are systems, system management will be effective if, in the process of transformations within the organization, the ratio of the quantity and quality of consumed resources at the output-input will increase. Otherwise, management of the organization is not effective.

A situational or case approach to management, like a systemic one, is more a way of thinking than a set of specific actions [20]. The method was developed at Harvard Business School (USA) and offers future managers to quickly solve problems in a specific situation. A situational approach is not a simple set of rules proposed for management, it is a way of thinking.

Methodology of the situational approach:

1. The manager must be familiar with professional management tools, understand the management process, individual and group behavior, system analysis, planning and control methods, etc.

2. Each management concept and technique has strengths and weaknesses. The leader must foresee possible consequences, both positive and negative.

3. The manager must correctly interpret the situation. It is necessary to determine which factors are the most important and which effect can be due to them.

4. The manager must be able to tie specific methods to a certain environment of activity, which would cause the least negative effect, give the least disadvantages, and provide a rational way under these circumstances.

In fact, the effectiveness of management decisions made with a situational approach depends on the professionalism of managers and their correct understanding of

the situation. In order to achieve positive results of managerial activity when applying the situational approach, managers of the enterprise or its structural divisions must not only correctly interpret the situation and the factors that caused it, but also possess the entire arsenal of methods and tools of managerial activity, understand their advantages and disadvantages, and implement the optimal selection of possible options for management actions.

The basic elements of the concept of situational management are:

1. The main situational factors: - the state of the external environment; - the state of the internal environment in the organization (qualitative-quantitative staff composition, relationships, team climate, management styles, culture, quality of management functions and their implementation, resources and their relationship).

2. A situational approach to the development of a management solution, which is focused on studying the impact of each specific situation on the production system. At the same time, the probability of the appearance of standard identical situations (given the practically innumerable set of options for combining situational facts) is extremely small. Situations in which the actual course of work production differs significantly from the planned (exceeds certain limits, established plans) at the current moment.

3. The technology of decision-making and implementation existing in the organization. The possibility of creating a situational management subsystem.

4. The role of the individual, the individuality of the style of management of the sociotechnical system. Human factor.

5. Analysis of situations - study of the parameters of the managed object, formed external conditions and specific circumstances (conditions, situations) of its functioning during the development and implementation of the solution.

As the situation may change, management must decide how the organizational structure needs to be changed accordingly in order to maintain the effectiveness of the organization. The situational approach tries to connect specific techniques and concepts with certain specific situations in order to achieve the goals of the organization more effectively [21].

In our opinion, the main conditions for the creation and existence of situational management should be:

- the activity of the organization should be determined by internal and external circumstances, and the theory should give recommendations on how to adjust the organization to specific requirements. In this sense, the situational theory rejects the claims of classical and psychological approaches to the development of universal rules for effective management;
- the parameters of the organizational environment determine the process of creating an optimal adaptive organizational structure;
- organizations that act with organizational context in mind tend to be more effective than those that do not.
- empirical research can be conducted to determine the optimal relationship between organizational structure, staff expectations, the environment, and organizational size.

A more detailed description of the strengths and weaknesses of the above-described approaches to enterprise management is given in the table. 1.5.

Table 1.5.

Advantages and disadvantages of approaches to enterprise management

Name	Characteristics of the approach	
	Positive aspects (advantages)	Negative aspects (disadvantages)
Process	• High level of enterprise management quality, since it is clearly visible responsible for the results of each step of the business process. • Minimization of controlled functions, coordination due to the responsibility for decision-making of the project manager or individual executor. • Optimization of centralized and decentralized approaches • Reducing the risk of suboptimization when managing a holistic process that passes through many departments • Moving away from fragmented responsibility during appointment of managers responsible for the process • Process management allows you to create better ones grounds for control of resources and time of execution of works Taking • into account the dynamic nature of development organizations; • A significant reduction in management costs achieved by eliminating duplication functions and redundant management links • Implementation of horizontal management structures with little hierarchy, the basis of which are business processes	• High level of financing when switching to process approach to management • Difficulties related to perception employees of a new approach to management • The complexity of implementing the process approach, which consists in the fact that there is a need for documentation of each process Inadequate display of the • process the approach of the relationship between elements management, changes in the organization as a whole, in the implementation of its goal in connection with changes in some element of the organization • Responsibilities and criteria for management success make sense only in the context of a specific process • Reducing the possibility of professional growth and narrowing the competence of workers
Functional approach	• Management is carried out by a set of units • Units specialize in execution specific type of work • Consistency of all operations • High level of professionalism of Horosha employees interchangeability within each unit Acquisition of new • quality by the management system enterprises • Obtaining the mechanism of the fastest reaction to changes in economic conditions • A clear division of functions makes it possible to create a sustainably operating enterprise • Increasing the quality of management of the main activity	• Limited areas of responsibility – lack of a person responsible for the entire process; - problems at the junctions between functional divisions – individual functional elements can be executed perfectly, but the end result of the whole process is unsatisfactory. • Excessive level of bureaucracy (approvals, control, delegation of authority, etc.) • Employees are focused on the process of doing work, not on the end result • A large number of reconciliations, which increases the term of work until the final result is obtained
Situational approach	• Achieving the goal of the enterprise in the given time conditions Determination • of the conditions for the formation of the concept enterprises regarding the development of the management system • Taking into account a specific set of circumstances that affect the enterprise at the present time • Finding optimal solutions in specific situations • Significant time savings when needed quickly make a decision	• Focusing exclusively on standard tasks • Lack of strategic planning • The complexity of forming assessment criteria management efficiency considering the wide the range of situations that arise at the enterprise, in connection with which it narrows manageability of the management process • Management is performed at the level of the situation when it controls the process, not the process the situation.
A systematic approach	• Determination of management goals and criteria economic stability of the enterprise • Subordination of the established criteria to the general purpose of the enterprise's functioning • Consideration of all elements of the system in relationship • Application at different levels from one division to the entire enterprise. In everyone in this case, the object of management is considered as a whole system • Focusing on loosely structured problems, search for the best option for solving them.	• weak focus on image formation employees, which leads to demotivation; • inadequate horizontal integration the most important management functions, such such as recruitment, assessment, compensation and development employees Managers perform these functions beyond a single comprehensive approach to personnel: • insufficient involvement of line managers and employees in the development and implementation of management concepts; • ignoring changes in people's value orientations, indifferent attitude towards the goals of activities of various groups • Use of expensive technologies, automated control systems • Does not involve decomposition into interconnected procedures both at the "input" with suppliers and at the "exit". with buyers and customers.
Traditional approach	• The acquired experience is studied and improved • Development of skills and abilities acquired in everyday activities • Uniform progressive development of all elements of production and achievement of common goals	• Approach stifles initiative • Resists innovation • Does not contribute to the development of the enterprise

Source[22]

Each of the above approaches has a practical use. Often, two approaches are used in parallel in enterprise management.

1.2. Transformation of the basic management approaches of the construction enterprise under the influence of digitalization

The modern market is characterized by a rapid pace of development, saturation with a wide range of high-quality products, which are produced both domestically and imported from abroad. All the most important discoveries of management are mostly a matter of the distant past.

Highlighting the features and trends of the development of modern management makes it possible to reasonably forecast the prospects of its development. As it follows from the reports of the leading managers of Central and Western Europe, the USA, the main changes in the activities of managers will take place in the following areas [24]:

- the authoritarian management style gives way to a democratic one;
- the number of management levels is reduced;
- the practice of delegation of powers is expanding;
- salary becomes more dependent on qualifications and results;
- most work is performed by multifunctional teams;
- the main attention is paid to people management;
- the demand for universal managers is growing;
- the practice of freelancers is expanding.

The periodization of the development of management concepts is given in Table 1.6.

Table 1.6.

Stages of development of scientific concepts of management

Period	Concept	Contribution to the development of management
The beginning of the XX century.	Scientific management	Methods of rationalizing labor and increasing its productivity focused on the specific worker and the production process in which he was involved.
20s of the XX century.	Administrative management	Functional division and specialization of the management of the management object represents the enterprise as a whole, the functions and levels of management are distinguished, that is, a hierarchy appears in the management process.
30-50s of the XX century.	Behaviorism	Increasing labor productivity by taking into account the interests and needs of employees through the implementation of a motivation system.
60s of the XX century.	Quantitative (systemic) approach	Operations research, the use of economic-mathematical methods and modeling to justify optimal management decisions; distinguishing strategic management as an independent scientific direction.
70-80s of the XX century.	The organization is an open system	Development of new approaches to management theory: development of marketing, leadership theories, activation of communication processes.
90s of the XX century.	Situational approach	Active use of strategic planning and management methods and innovation management methods, which encourages enterprises to use flexible adaptive organizational management structures and stimulate decision-making "on the ground".
The beginning of the XXI century.	Total Quality Management (TQM)	Methods of managing organizational changes, theory of self-organization, self-management, development of functional areas of management. The concept of white space in the organization. Knowledge management. The concept of TSM – T-Shaped Management.

Source[22]

The set of these prerequisites makes it necessary to find new solutions, to be ahead of competitors in development. This can be achieved by introducing modern concepts and approaches to management organization.

The result of the evolution of management thought was the formulation of a new management program, made by a group of famous scientists and managers of famous

companies, which was called "Management 4.0", the premise of which is "Industrial Industry 4.0".

The global pandemic caused by COVID-19, as well as the changes currently taking place in the political, economic, social, environmental and other spheres, lead to the acceleration of the process of digitalization of economies, the construction of smart cities, the introduction of the concept of smart specialization at all levels starting from the state level and ending with the level of an individual enterprise.

Let us now consider the essence of the category "digitalization". Today, the issue of specifying the content of this category is topical and is considered in sufficient detail in the scientific literature. In fig. 1.12. separate concepts of its consideration are presented.

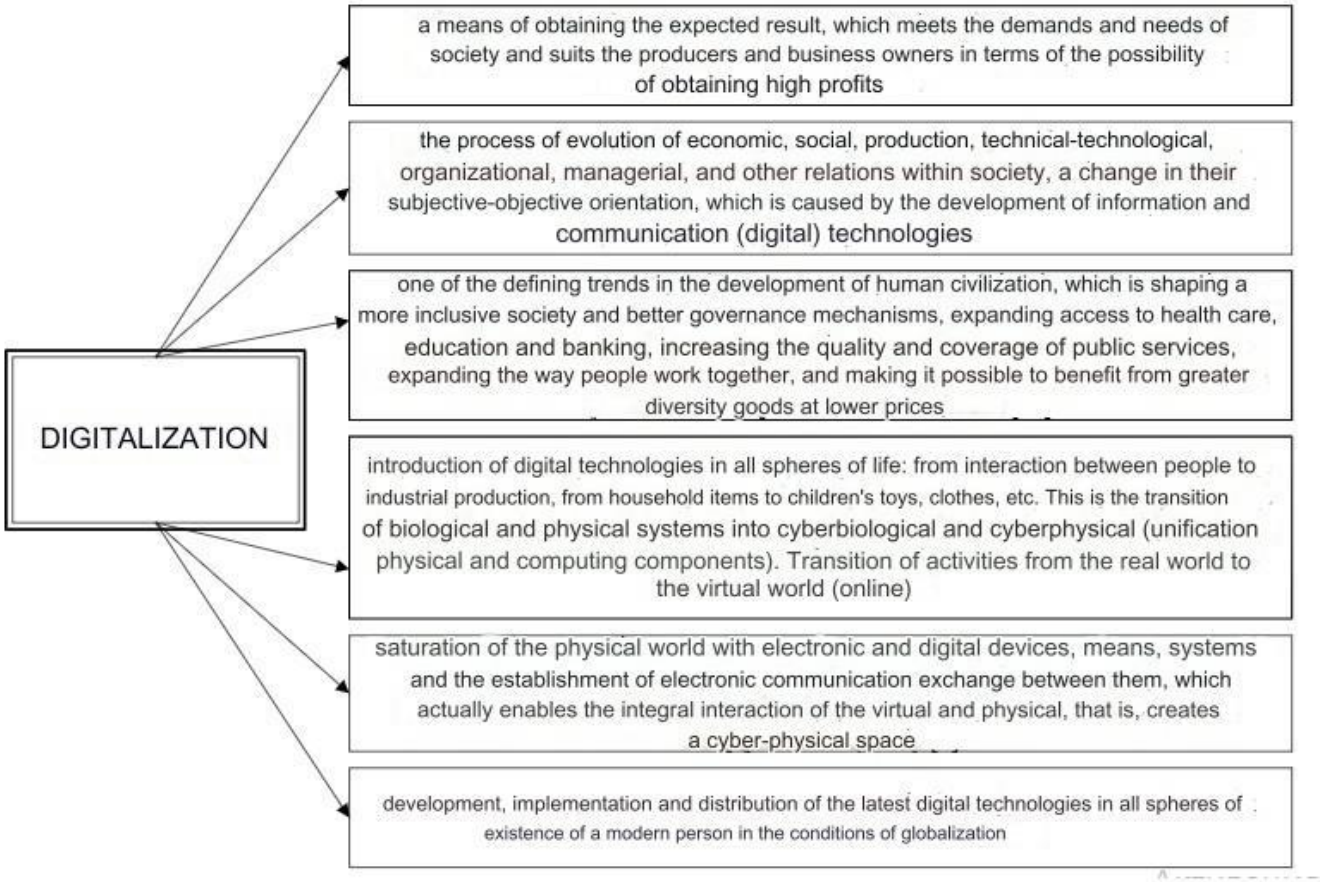


Fig. 1.12. Scientific approaches to the consideration of the essence of the "digitization" category

Source [23-29]

Digital transformation is considered as a process of changing the model of functioning of a separate system, its components, and the relationships between them, which is caused by the active use of information and communication technologies.

Digitization enables employees to do their jobs more efficiently. In particular, in recent decades, digitalization has mostly changed the way people work, for example, greater support from Internet communications and information sharing, as well as mechanical support for information processing. Therefore, fewer people are needed to perform the necessary tasks.

Digitization primarily helps solve simple tasks, so employees must have higher qualifications. In addition, digitalization also creates new forms of employment.

Digital networks and communication infrastructures provide a global platform on which people and organizations strategize, interact, communicate, collaborate and search for information. The above trends also affect the field of management and administration.

One of the important tasks of the head (manager) is the constant improvement of the management system of the organization. Therefore, improving the organization's management is impossible without a certain change in its classical functions, namely: expanding the list of competencies and skills of the manager, about the emergence of new tasks and problems that need to be solved, about the emergence of new professions and new forms of work organization.

In the conditions of the development of digital technologies, there is a certain modification of traditional management functions (Table 1.7).

Table 1.7.

Transformational characteristics of the process of implementation of management functions

organizations in the digital age

Functions	Implementation of management functions using digital technologies
Planning	The planning process is simplified by the use of various types of software. In particular, software complexes consisting of: stand-alone module responsible for system configuration (Stand Alone Configuration Engine, SACE), electronic commerce module (Electronic Commerce, EC), production planning module (PP), material flow management module (MM) , the supply chain management module (Supply Chain Management, SCM; previously the term Distribution Resource Planning, DRP was used), the advanced planning and scheduling module (Advanced Planning and Scheduling, APS) [31]
Organization	The most common examples of the use of automated systems in the organization of a manager's work are time accounting, a database, a database of primary knowledge, statistics, automation of accounting for trainings, a personal development plan, setting tasks, and others. Digital integration with cloud services allows you to reduce workload (automation of routine work, reduction of time and resource costs for processing and storage of accompanying documents). Artificial intelligence. Integrated software products, well-thought-out algorithms for responding to users' actions and words make it possible to create an "image of a person" able to effectively interact with job candidates, new employees undergoing adaptive training, HR managers and line managers when creating analytical reports [32]
Motivation	Digitization makes it possible to use such methods non-material motivation of employees: Gamification of the workplace that involves use game elements in work processes to improve employee engagement. Certain employee loyalty programs are being created, which track user generated content and traffic to allow them to level up, collect badges and earn rewards. In fact, gamification is part of one of the most powerful internal motivators - competition [33, p. 130].
CONTROL	The use of integrated mobile applications built into the company's automated management system allows: monitor the movement of personnel and inform about tardiness, control the level of stress and regulate the course of the working day, optimize the action plan, ensure the availability of constant feedback [34]

Source[31-34]

In the framework of our research, it is significant to define digital transformation in management as a process of integrating digital technologies into all aspects of the

enterprise's business activities, which requires fundamental changes in technology, culture, operations, and the principles of creating new products and services. For the most effective use of new technologies and their prompt implementation in all spheres of activity, enterprises must abandon their former foundations and completely transform processes and work models (table 1.8.).

Table 1.8.

Key factors of digitization in management

Factor of digitization in management	Characteristics of the factor	Influence on conditions and ways of doing business
Mobility and ease of connection to the Internet	The exit of business and the population into cyberspace thanks to the development of mobile technologies and the wide spread of the Internet	Formation of new forms of doing business (virtual companies), reduction of transaction costs of doing business (in particular costs of coordination, searching for information), changing forms of interaction with the client
Datification	Exponential growth in the amount of information used by humanity	The transformation of data into a key factor of economic production and a revenue-generating asset of digital business, which is accompanied by a change in traditional business models
Computerization	Increasing productivity of computers	Increasing the efficiency of the management decisions made due to acceleration
Development of digital technologies, including artificial intelligence	Simplifying the process of processing a large amount of information	Increasing the efficiency of the enterprise, automating operational processes, reducing costs
Speed	Significant acceleration of economic processes	Rejection of traditional forms and methods of management, for example, project management, which does not allow making operational management decisions
Ecosystemicity	Formation of an environment that provides complex conditions for the development of innovative processes and digital technologies	Transition to ecosystem business models that ensure business diversification

Source[35-36]

In the conditions of technological revolution 4.0, there is an increase in the number of digital managers, which contributed to the "revolution of managers", which leads to the emergence of a new creative class - creative managers.

The concept of "digital management as the implementation and expression of the creativity of education and personality" involves the creation of such an information structure of the organization and society, where all particles of "digitalization" would ensure the necessary level of coincidence of all information components on a new

innovative digital basis. Digital management is considered as the basis of an innovative society, "on the basis of which innovation and digitalization are cultivated" [37].

The basis of digital management is the principle of technological determinism, the development of science and technology, new creative technologies - nanobiotechnologies, socio-humanitarian technologies, which are often called "breakthrough technologies".

The general model of digital management of the organization can be presented on the basis of the theory of mirrors and taking into account the criteria of optimization of communications (Fig. 1.13.)

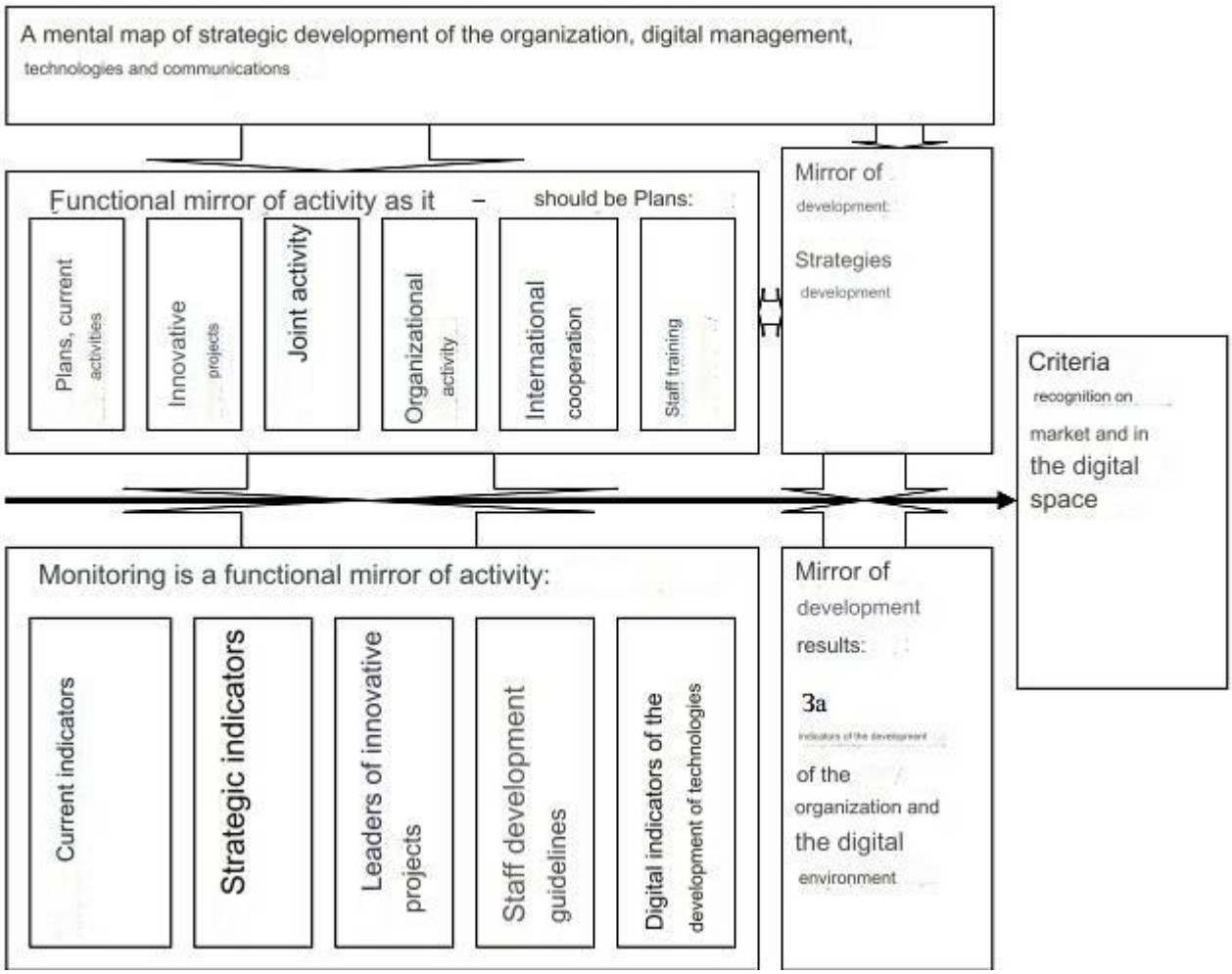


Fig. 1.13. Digital management model

Source[38-39]

The concept of digital management should be implemented in all directions of society's development, starting from primary school to higher education, at all levels of civil service and local self-government, which require the formation of an intellectual and creative personality as a subject of the informational and innovative type of society of

digital civilization. There will be a reduction in jobs, because computers will enter every organization and everyday life, there will be a "combat between man and machine".

Computerization will totally affect our life, economy, politics, social, cultural and other spheres of development. Therefore, it is necessary to form successful innovative strategies and make maximum efforts for the further development of digital management, which is based on the development of digital human capital

Presented in fig. 1.14. the information shows the prospects for the use of digital technologies in all sectors of the economy.

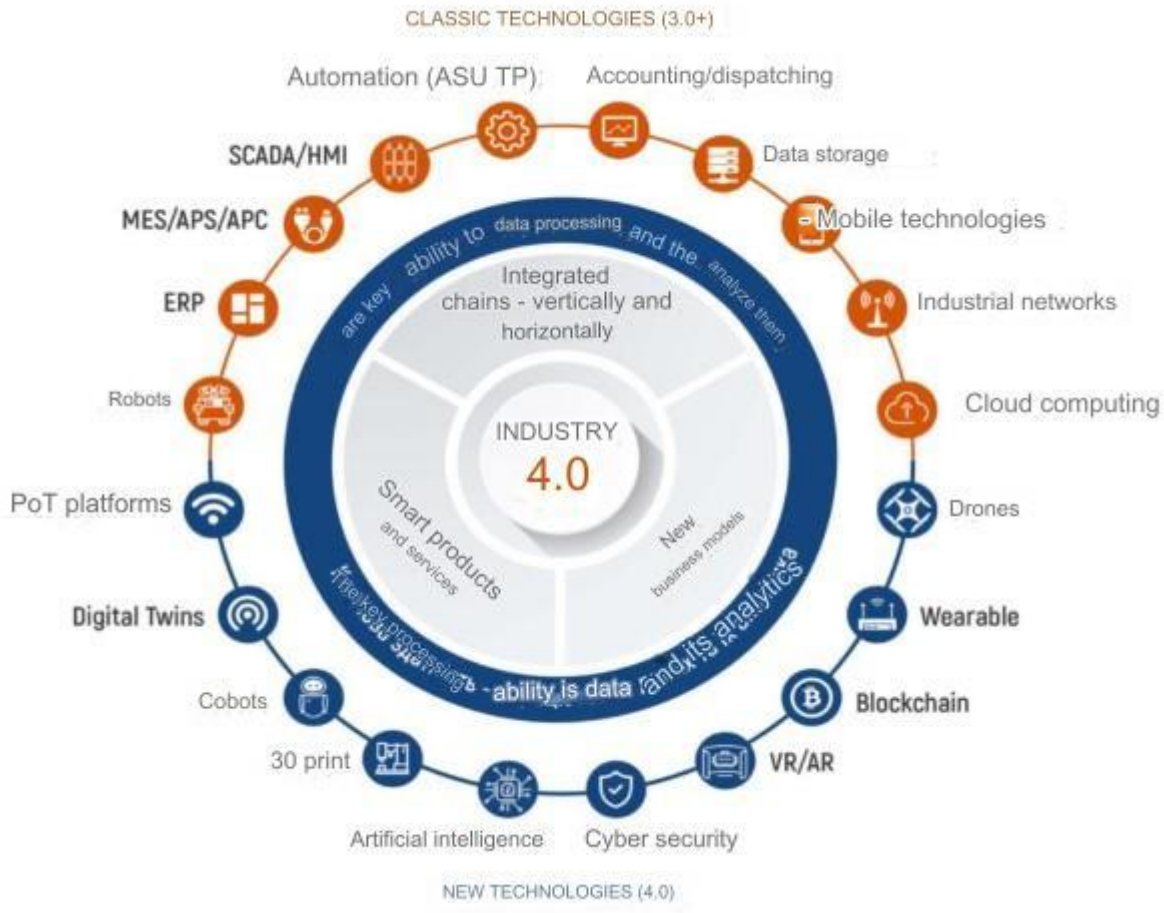


Fig. 1.14. Key technologies of digital transformations of the economy

Source[38-39]

Today, digital transformation is penetrating all sectors of the economy at different rates, let's take a closer look at the construction industry. Construction is a conservative industry.

Modern construction enterprises, as a rule, implement innovative technologies in the following spheres of activity [40]:

•in the field of design - application of modern perspective projects and innovative research and development developments;

•in the field of construction production - the use of innovative technologies, the latest techniques and equipment, products, semi-finished products and various modern construction materials;

•in the field of construction organization and management - the introduction of progressive methods of production organization and new relevant methods and techniques of construction management, which ensure the efficiency of the construction process, as well as an increase in the quality of repair and construction and assembly works and services and an increase in the competitiveness of the enterprise (table 1.9.)

Table 1.9.

Examples of implementation of Industry 4.0 in the construction industry

Types of innovation	Examples
1. Innovations related to building materials (product).	1) use of non-combustible wooden structures instead of concrete and bricks; 2) use of self-cleaning paints; 3) production of certain elements with the help of 3D printing; 4) construction of structures from salt blocks, which are mixed with starch and covered with material using epoxy resin; 5) self-healing in the production of concrete capsules are used by 3 bacteria if the concrete cracks, the capsules dissolve under the influence of water, the bacteria come to life and secrete limestone, which clogs the cracks. The development will make it possible to extend the service life of concrete by a decade and save on expensive concrete repairs

Continuation of table 1.9.

2. Innovations related to construction technologies (processing)	1) VIM technologies; 2) 3D printers with a working volume of about 1000 m 3 and with the technical possibility of printing with concrete mixture were developed for construction; 3) 3D printers printing houses from construction waste in Nantong (PRC, Jiangsu Province); 4) houses floating in the air in Japan. The Japanese company Air Danshin Systems Inc. has developed a system that allows you to raise a house above the ground in case of earthquakes. The building is located on an air cushion and is not fixed to the foundation. After the earthquake begins, the sensors located around the perimeter of the building are activated. They start compressors that raise the house 3-4 cm from the ground, which allows to minimize the consequences of earthquakes.
3. Innovations related to the organizational, economic or management mechanism	1) digitization of business processes; 2) cloud process management.

Source[40]

With the development of computer technologies, as well as in connection with the application of system analysis in programming, the process approach found its application in the description and modeling of the design stages, first of all, of software. A number of developed notations (for example, SADT (StructuredAnalysisandDesignTechnique), WFD (WorkFlowDiagram, work flow diagrams), DFD (DataFlowDiagram, data flow diagrams), ERD (EntityRelationDiagram, "entity relationship" diagrams), STD (StateTransitionDiagrams, diagrams of state transitions), which allow you to visually represent various processes (sequences of actions, flows of information and resources) in the form of graphic models, made it possible to optimize processes in order to shorten the development cycle.

As for enterprises in the field of architecture and construction, their digital transformation determines a number of tasks, the solution of which involves digital management, the implementation of building information modeling (BIM) technology and the optimization of business processes to ensure the growth of profitability and competitiveness of enterprises in the sector.

The essence of BIM technology is [41; 42]:

- creation and accumulation of parametric information about the construction object and the surrounding territory in a digital representation;

- joint use of information by all participants in the construction process at all stages of the object's life cycle.

Currently, the construction industry has a number of systemic, interconnected problems and challenges (see 1.15).

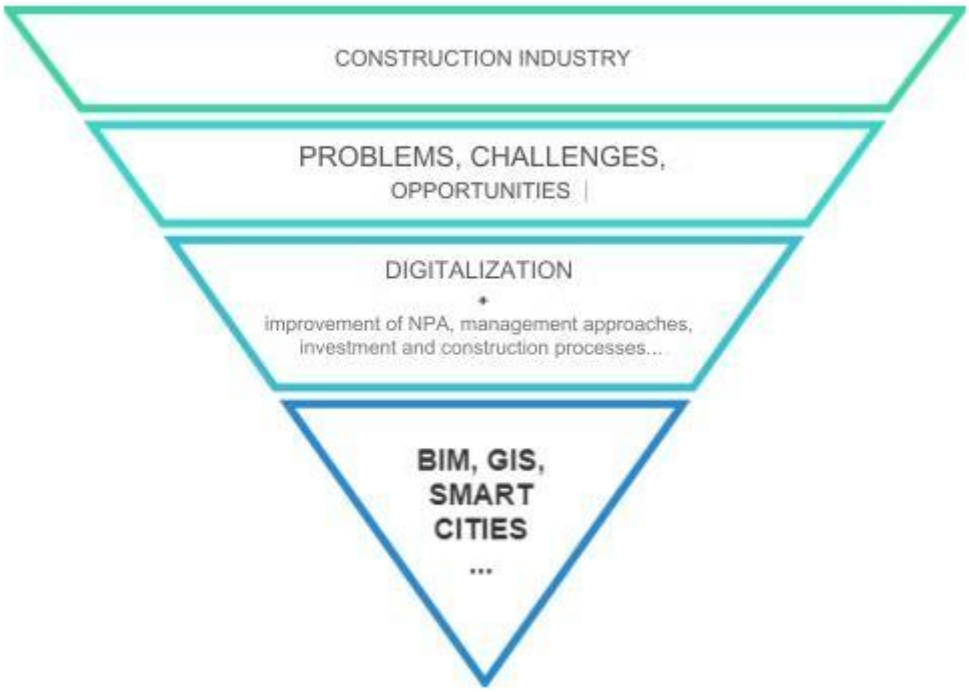


Fig. 1.15. Schematic positioning of BIM and related approaches in the industry context

Source[43]

Construction is considered quite inefficient both as an independent process and in the form of final results, which leads to an increase in the implementation period, an increase in the costs of construction and operation, a decrease in quality, the level of safety, environmental friendliness, etc. Technologies and management approaches used in domestic construction are outdated compared to European countries.

The basis of the concept of VIM and strategic management of innovative projects for the future in the study is a systematic approach and the main characteristics inherent in the operation of the economic system - as a set of elements and relationships between them that form a certain integrity.

A scenario approach is promising for solving tasks in these directions - dynamically developing a number of indicators for the life cycle of the project, taking into account all factors affecting the project goal, as well as options for measures necessary to achieve this goal according to the following criteria: volume - quality - deadlines - cost - risks - efficiency.

CHAPTER II. ANALYTICAL ASPECTS AND PRACTICAL ASSESSMENT "PUSHAHOUSE APARTMENT" PROJECT FROM KYIV BUILD DEVELOPMENT

2.1. Analysis of the construction industry and general characteristics of the activities of LLC "KYIV BUILD DEVELOPMENT"

The war launched by Russia against Ukraine led to devastating consequences in the economy of our country (as of April 11, 2022, the total amount of direct documented damage to infrastructure, based only on public sources, reached 80.4 billion US dollars or 2.4 trillion UAH [44].

The construction sector is currently and in the long-term perspective one of the important areas of the economy that will influence regional development through the restoration of destroyed infrastructure, reconstruction and construction of housing for citizens, and first of all, for those who have lost their housing (internally displaced persons).

An important aspect is that it will create new jobs for the population. As of April 6, 2022, developers resumed construction of 427 residential complexes. According to the LUN portal, 80% of restored buildings are located in Vinnytsia, Volyn, Ivno-Frankivsk, Lviv, Ternopil, Khmelnytskyi, Cherkasy, Chernivtsi, and Zakarpattia regions [45].

In peacetime, the construction sector developed successfully. According to the results of 2021, according to the data of the State Statistics Service of Ukraine, the construction industry maintained significant growth rates (table 2.1.) [46].

Table 2.1.

Index of construction products by types in 2011-2021*

(in % to the previous year)

	Construction, everything	Buildings	Including		Engineering buildings
			residential	non-residential	
2011	120.0	114.9	101.7	122.1	124.4
2012	92.7	93.9	93.5	94,1	91.7
2013	89.0	96.6	111.3	90.0	82.8
2014	79.6	79.6	103.5	66.3	79.7
2015	87.5	91.7	98.9	85,8	83.7
2016	117.5	120.8	117.8	123.7	114.0
2017	126.4	121.5	116.3	126.1	131.7
2018	108.6	103.5	100.9	105.7	113.6
2019	123.6	119.1	104.8	130.3	127.7
2020	105.6	93.7	83.5	100.3	115.6
2021	106.8	110.0	119.2	105.1	104.6

The data are given without taking into account the temporarily occupied territory of the Autonomous Republic of Crimea, the city of Sevastopol, for 2014-2021, as well as without a part of the temporarily occupied territories in the Donetsk and Luhansk regions

Source[46]

The state of affairs in the construction industry is one of the key indicators of the state of the economy. Dynamics in construction in 2021 roughly corresponds to the declared growth of the country's GDP by 3%. The volume of completed construction works in Ukraine in 2021 increased by 5.1% to UAH 253.9 billion, compared to a 5.6% increase in 2020. Construction activity was relatively high, with the traditional exception of the first quarter. And the October decline was caused by a sharp rise in energy prices.

On the one hand, the drivers of the industry have changed. In 2021, the overall dynamics of the industry was determined by the housing construction sector, while in the previous year, it was the construction of infrastructure facilities. In particular, the growth of residential construction amounted to 16.8% in 2021 (in 2020 there was a drop of 16.5%), the non-residential construction sector grew by 3.2% over the year (in 2020 – by 0.3%). the construction of engineering structures last year showed a growth of 3.1% (in 2020 – 15.6%) (table 2.2.)

Table 2.2.

The total area of residential buildings put into operation, by type in Ukraine[46]

	2014	2015	2016	2017	2018	2019	2020	2021
Construction	51108.7	57515.0	73726.9	105682.8	141213.1	181697.9	202080.8	258073.6
Buildings	24856.5	28907.5	38106.4	52809.6	66791.6	83589.3	80625.6	102894.3
residential	11292.4	13908.8	18012.8	23730.0	29344.8	33208.8	29083.6	39147.9
non-residential	13564.1	14998.7	20093.6	29079.6	37446.8	50380.5	51542.0	63746.4
Of them								
buildings of transport and facilities connection	-	-	-	392.5	550.5	737.8	769.6	668.8
industrial buildings and warehouses	-	-	-	-	10363.2	13414.6	15971.8	19848.4
Engineering buildings	26252.2	28607.5	35620.5	52873.2	74421.5	98108.6	121455.2	155179.3
transport facilities	6998.6	7232.9	9819.5	19001.0	27428.3	33532.4	67857.8	90093.0
highways, streets and roads	4347.2	5613.4	7678.3	16395.9	23540.9	27074.8	62126.8	83957.3
railways	1106.7	715.3	856.0	1091.0	1764.0	1999.3	1890.8	1729.1
runways	6.6	0.6	k/s	46.4	30.7	515.1	429.0	680.9
bridges, overpasses, tunnels and subways	465.2	449.6	k/s	833.5	1192.4	2441.4	2295.5	2729.8
ports, canals, dams and other water structures	1072.9	454.0	693.2	634.2	900.3	1501.8	1115.7	995.9
pipelines, communications and power lines	5683.4	7443.0	9809.2	12805.3	15950.5	20583.4	21945.0	26804.7
main pipelines, communications and power lines	2821.9	3738.7	4949.1	6216.6	7520.5	9287.7	10058.6	12428.8
local pipelines and communications	2861.5	3704.3	4860.1	6588.7	8430.0	11295.7	11886.4	14375.9
complex industrial buildings	10632.6	10436.3	11685.2	16186.7	24291.0	36638.8	25333.1	30746.3
mining facilities and mining enterprises	7482.9	7133.2	7995.8	10108.1	13676.9	15501.6	14008.7	17309.1
buildings of electric power enterprises	1389.6	1675.8	2137.9	3657.1	7100.3	16500.5	7532.9	8982.8
buildings of chemical industry enterprises	184.9	174.6	194.6	240.6	280.9	210.9	342.4	377.1
buildings of enterprises of the metallurgical industry	1575.2	1452.7	1356.9	2180.9	3232.9	4425.8	Activation	4077.3
other engineering structures	2937.6	3495.3	4306.6	4880.2	6751.7	7354.0	T06319.3	IVIR 7535.3
of them sports facilities and entertainment purpose	243.4	158.2	248.9	427.8	729.2	1748.0	section "Parameters". 1856.3	2945.1

In the period of post-war reconstruction, the provision of housing will be crucial. In some regions of Ukraine, developers continue to build high-rise buildings in war conditions.

It is appropriate to consider certain aspects of the financial and economic analysis of the activities of domestic construction enterprises, which were reflected in the compiled rating of construction companies of Ukraine.

The reliability rating of builders is compiled to investigate the risks of construction companies fulfilling their obligations to investors - real estate buyers, so that an interested person can check who can be trusted with their own funds.

The 24 largest developers working in Ukraine were included in this rating. A mandatory condition for participation was the presence of projects under construction. After all, the main purpose of the rating is to assess risks for investors [47] (table 2.3.).

Table 2.3.

Reliability rating of builders

Company	Rating	Financial reporting	Owners' risk	Permissive documentation	Litigation risks	Delay	Transparency
Stolitsa Group	3.5	C	A	A	A	B	B
Kovalska real estate	3.0	D	B	B	B	A	B
KSM group	2.5	B	C	A	B	B	D
Perfect Group	2.0	D	D	A	B	B	C
Kyivbuddevelopment	1.5	D	C	C	A	D	C

Source[46]

From table 2.3. we see that all builders have an average level of reliability. Let's take a closer look at the activities of the Kyivbuddevelopment company (Fig. 2.1.) and the main types of its activities (Fig. 2.2.)

Fig. 2.1. Legal information of the "KBD" Company

Source[47]

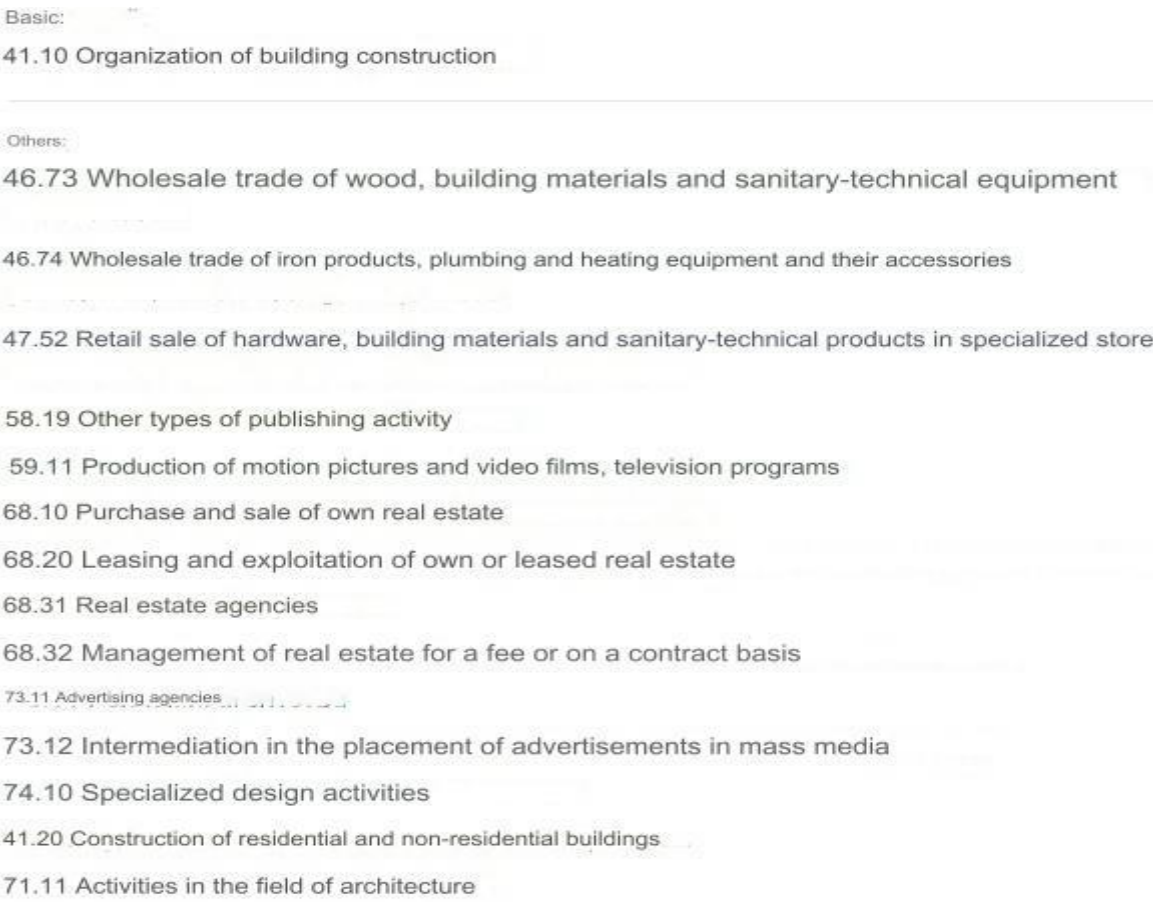


Fig. 2.2. Types of activities of the "KBD" company

Source[47]

The KBD company has been on the market since 2016. During this time, the KBD.Capital fund invested 13 million dollars in projects.

To date, it has 9 buildings in the Pechersk district of Kyiv. In the construction of complexes, materials produced at our own factory are used.

The developer responsibly approaches the design and construction of each residential complex, creating not just square meters, but comfortable, cozy housing and public areas. To preserve the originality of the Pechersk Hills, the company's projects are low-rise clubhouses.

For a successful process of enterprise development, it is necessary to create the necessary conditions for forming a development strategy, goals, building an organizational structure, making and approving management decisions in order to assess the efficiency of the enterprise.

The effectiveness of the activity depends on the production structure, which is determined by the specialization and scale of production, the degree of development of the enterprise, the level of use of equipment and technology, external and internal conditions of establishment, forms of labor organization [43, c. 42].

At the same time, the organizational structure shows the relationship between various management units, their hierarchical structure, while ensuring the development of the enterprise's production and economic interests. The organizational structure of "KBD" LLC is shown in Fig. 2.3.

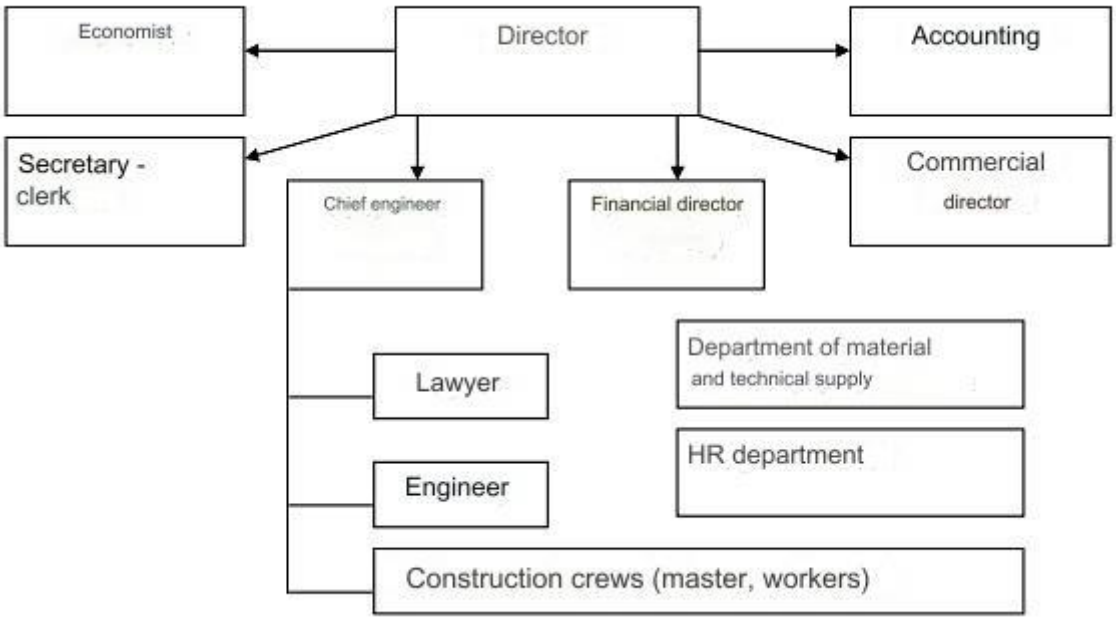


Fig. 2.3. Organizational structure of KBD LLC

Source[47]

The relationship between the elements of the management structure is supported by horizontal and vertical connections. Horizontal ones are of the same level and have the character of agreement. Vertical, in turn, are relations of subordination.

When studying the system, it is necessary to determine structural components with mechanisms for ensuring its functioning.

The structure of the system is its elements (subjects and objects); the mechanism is the norms that should regulate the interconnections in the middle systems.

The functional interaction of all subsystems should create a synergistic effect, which leads to the successful implementation of the development project and affects the effective activity of the development company as a whole. Generalized management of the company should have the form of a complete system working to achieve certain results (Fig. 2.4.)

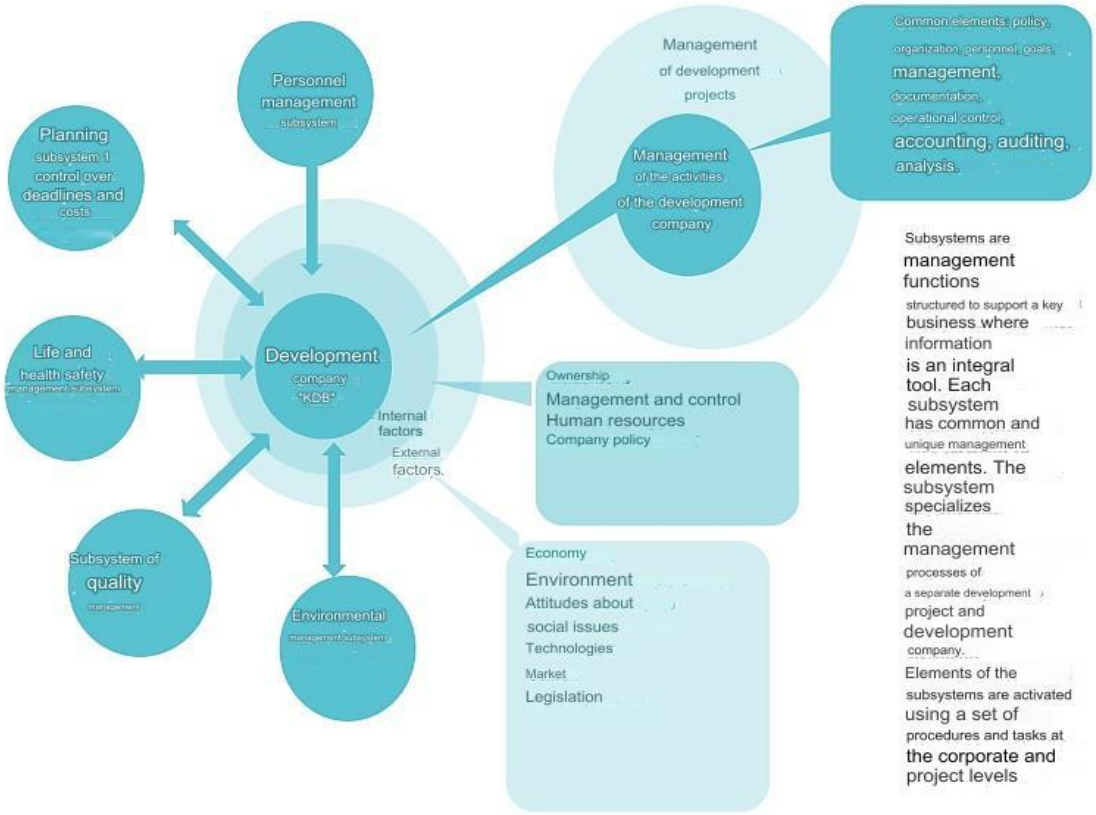


Fig. 2.4. Levels of activity management systems of the development company "KBD"

Source[47]

The effective management of the company's activities depends on certain aspects, which can be attributed to: the construction of management based on the principles of balance, manageability, effectiveness, efficiency, modernization, transparency and openness, dynamism, which will contribute to ensuring effective control over all phases of the production process in the company; choosing the optimal project financing model; minimization of cost of funds and time for project implementation; recruitment and motivation of personnel.

With the hierarchical structure of the management system, the need for these connections arises, that is, with the presence of different levels of

management, each of which pursues its own goal. Features that affect the personnel management process at KBD LLC are listed in Table 2.4.

Table 2.4.

Peculiarities affecting the personnel management process at KBD LLC

Features of construction work enterprises	Peculiarities of personnel management
– the uniqueness of the vast majority of construction objects;	– assessment of the economic efficiency of the adopted organizational, technical and managerial is complicated by the significant duration of the implementation of construction projects;
– the dependence of a significant part of the work on weather conditions;	– personnel qualification;
– significant duration of construction (usually more than 1 year);	– a large number of participants, combined with a complex process of organizing document flow, as a result of which it is difficult to determine the subject and the level of responsibility for ambiguous or erroneous decisions;
– long product life cycle of construction (may be more than 100 years) c totality with the need to ensure the safety of operation of construction objects during the entire cycle;	– territorial separation of the administration of the construction enterprise and production;
– multi-stage implementation of construction projects.	· variety of works. performed types construction

Source[47]

For a complete and thorough analysis of work efficiency, it is necessary to determine all financial and economic indicators of activity: the company's profit, solvency, financial condition and profitability of products. These indicators play an important role for the company's management, at the time of making management decisions, cooperation with investors, creditors or future partners in justifying the importance of implementing this business plan.

The analysis of the financial and economic condition of the enterprise was made on the basis of the financial statements of LLC "KBD", namely Form No. 1 "Balance Sheet (Report on Financial Condition)", Form No. 2 "Report on Financial Results (Report on Total Income)" for 2019 2021 years.

The main indicators of the efficiency of economic activity are listed in Table 2.5.

Table 2.5.

Analysis of the dynamics of the main indicators of KBD LLC

Indicators	2021	2020	2019	Absolute deviation, +,-	
				2020 to 2019	2021 to 2020
1	2	3	4	5	6
Net income (revenue) from the sale of products (goods, works, services)	132711	100818	146826	-31893	46008
Cost of sales of products (goods, works, services)	113880	91731	130240	-36934	53294
Gross profit (loss)	18831	9087	16586	5041	-7286
Other operating income	3857	37	1143	-3820	1106
Other operating expenses	21383	15530	10655	-5853	-4875
Other income	373	40	777	-333	737
Other expenses	1619	794	462	-825	-332
Financial results from ordinary activities before taxation:	60	-7160	7389	7564	-235
Income tax from ordinary activities	200	1395	1287	1195	-108
Clean profit (loss)	-140	-8555	6102	-14657	-8415

Source: [Compiled and calculated on the basis of the company's financial statements]

From table 2.5. it can be concluded that the company's activity has a negative dynamic of the above indicators, because in 2020 and 2021 it suffered a loss. In our opinion, the main factors that influenced such negative trends in the development of housing construction are the global pandemic caused by the spread of the coronavirus disease COVID-19 .

2.2. Study of the main aspects of the "PUSHA HOUSE" project

Residential building PUSHA.house from the KBD.estate development company is the embodiment of the idea of peace and comfort in combination with modern architecture (Fig. 2.5).

Fig. 2.5. View of residential complex "Pushcha House"

Source[49]

Budmaidanchyk residential complex "Pushcha House" is located between the 2nd and 3rd Pushcha-Vodytsia lines, at the address Fedor Maksimenko (Chernoflotska) 7-a. Administratively, Pushcha-Vodytsia belongs to the Obolon district of the capital, but in fact I would call it a suburb (Fig. 2.6). And not just a suburb, but a real resort, surrounded by forests and lakes, with its own wonderful microclimate, which earned it the title of a real health resort at one time.

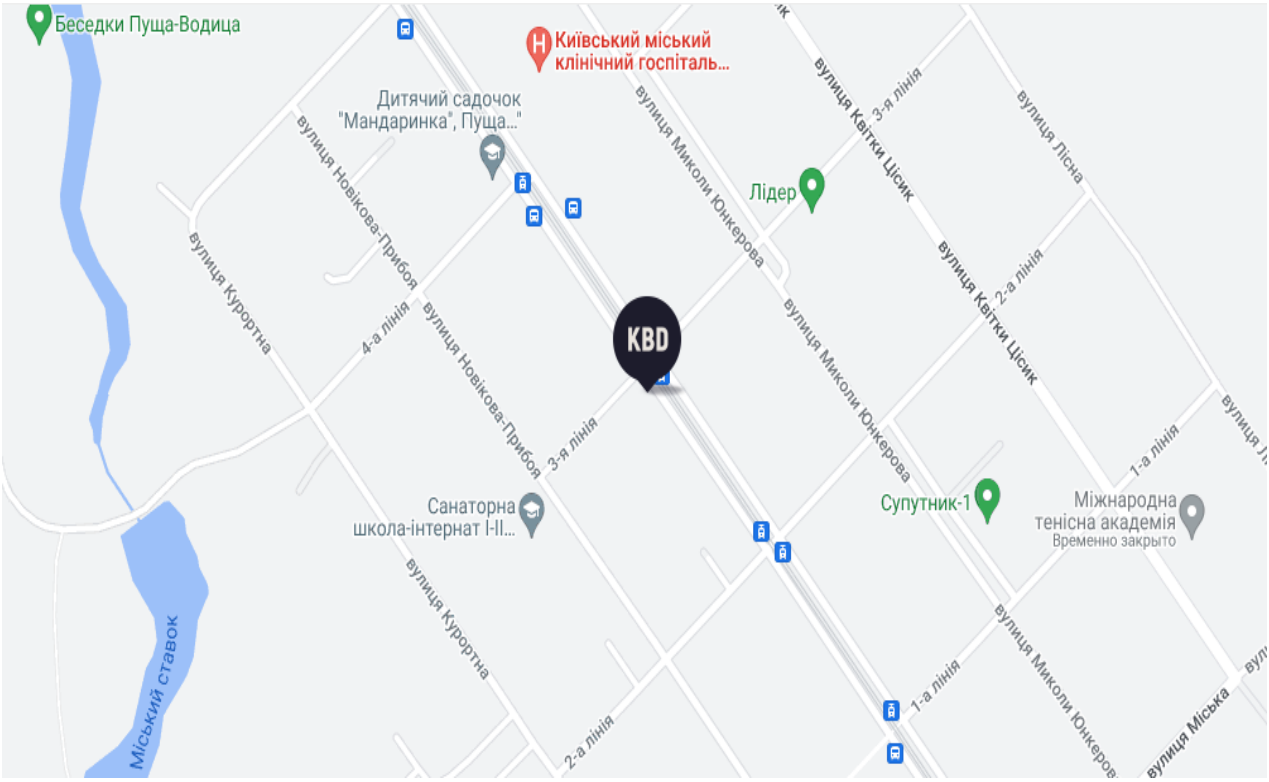


Fig. 2.6. Location of residential complex "Pushcha House"

Source[49]

The place for the new construction was chosen, in my opinion, successfully. A tram line runs nearby, providing convenient transport connections with the capital.

A shop and a kindergarten are relatively close, and a secondary school is a little further away. Although, of course, the existing social and household infrastructure of Puscha-Vodytsia generally cannot boast of good development and diversity yet.

But the situation is changing - even in the residential complex "Pushcha-house" there is a non-residential fund (it will occupy the two first floors), which will open a store, a beauty salon, a pharmacy and even a co-working space. A lounge area for residents will be created on the roof of the building.

Fig. 2.7. A view of the lounge area for residents

Source[49]

The future residential complex is positioned in the business class - and in many ways, in my opinion, it corresponds to it in many respects. The house is located in a closed, guarded area with 24-hour video surveillance of common areas. They promise to ennoble the area around the house and build a small landscape park on it, equipped with children's and sports grounds.

The new building will correspond to the declared class in terms of the ratio of the number of apartments and parking spaces. Yes, the PushaHouse residential complex has 96 apartments, and there will be 120 parking spaces. Of these, 50 cars can be accommodated in the guest parking lot, and 70 will be accommodated in the underground parking lot (it will be possible to go down to it by elevator). They promise that the parking lots will be equipped with chargers for electric cars.

The building of the residential complex will consist of three 8-story sections arranged in an L-shaped structure (Fig. 2.8). I would say that it is designed in the style of constructivism, but it is quite likely that the architect was inspired by examples of functionalism when developing his

project. In any case, the house turned out to be interesting. Simple geometric shapes "revive" a complex volume, ribbon glazing is combined with facade glazing, contrasting colors of facade decoration - all this gives the project individuality.

Fig. 2.8. Visualization of PushaHouse residential complex

Source[49]

The building is planned to be built using monolithic frame technology. The walls will be laid with bricks, the facade will be insulated with mineral wool and closed with a ventilated system. All communications here are planned centrally.

The design of the building provides for the construction of those sections - but two of them, judging by the floor plans, will communicate with each other. As a result, it will turn out that these two sections will accommodate 11 apartments on a typical floor - for business class, in my opinion, too many. Instead, 3 elevators, located at different ends of a long common corridor, will transport their residents through the floors. In the third section, there will be 6 apartments on a typical floor, the inhabitants

of which will be lifted to the floor by two elevators. All elevators will go down to the underground parking lot (Fig. 2.9).

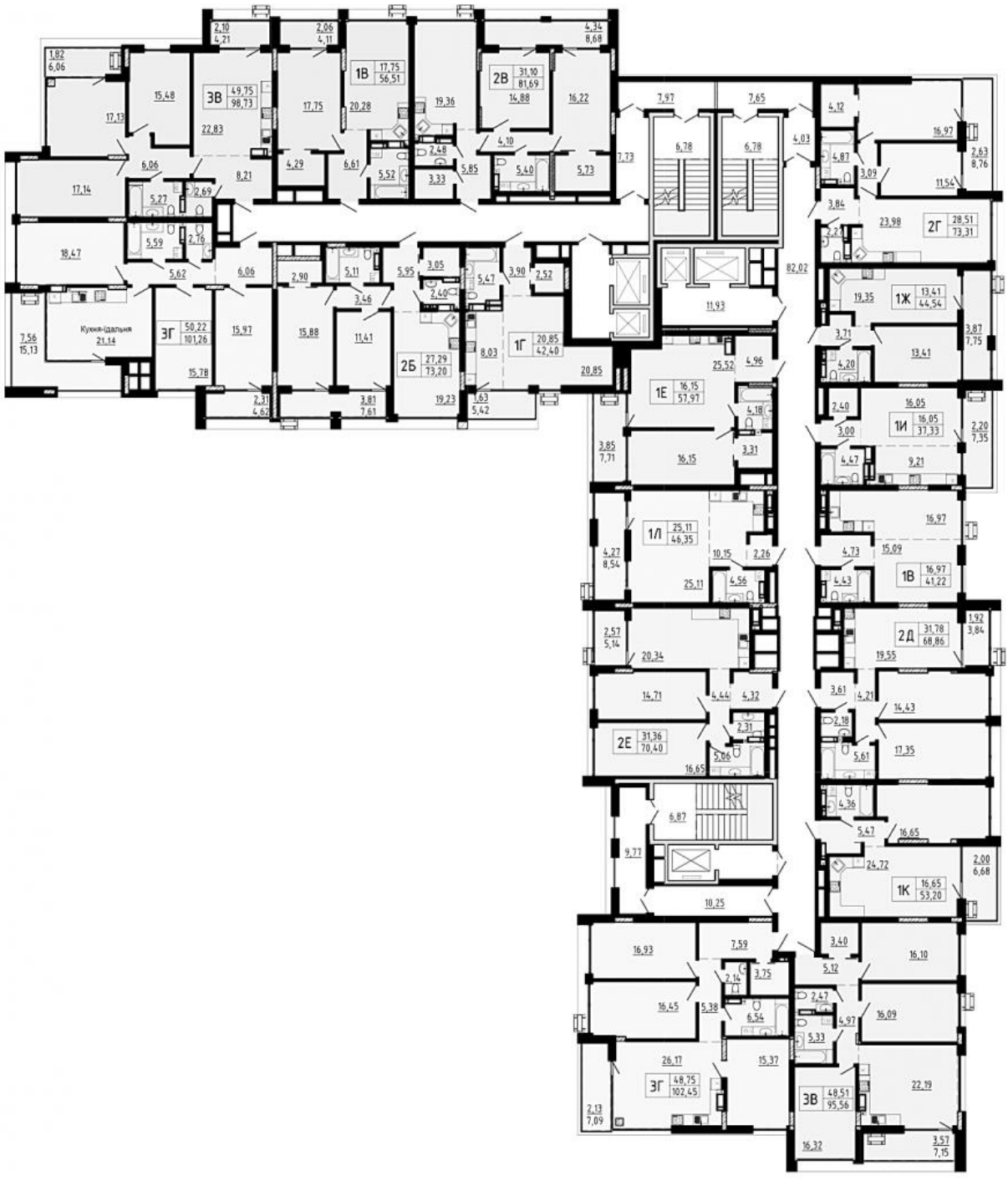


Fig. 2.9. PushaHouse residential complex plan

Source[49]

If we talk about apartments, then they are provided here with 1-, 2- and 3-room apartments. At the same time, their square footage fits into the business class – the smallest one-room studio will have an area of 41 square meters. Most of the other 1-room apartments are more spacious, their area is 45-59 sq.m. The area of 2-room apartments is 64-82 sq.m., and 3-room apartments are 93-105 sq.m. (Fig. 2.10.-2.11.)

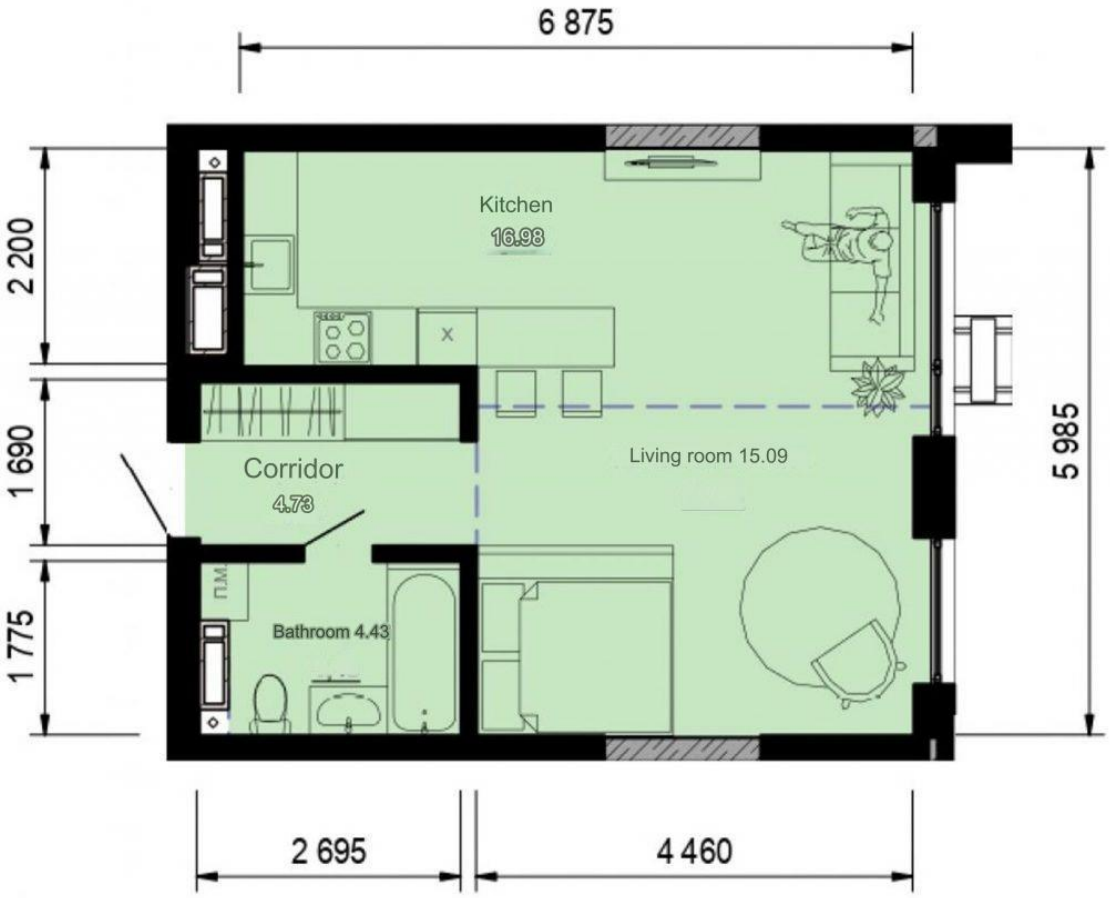


Fig. 2.10. A variant of the layout of the studio in the PushaHouse apartment complex

Source[49]

The planning here, in my opinion, is quite functional. Large kitchen-dining rooms, spacious bright rooms, many apartments have space for a wardrobe. There are apartments with terraces, some with balconies and loggias - and some without these excesses. In general, you can choose for any taste.

Fig. 2.11. Plaguing option for a 2-room apartment in the PushaHouse residential complex

Source[49]

The minimum price per square meter in the PushaHouse residential complex is $750 - it applies to some options for future housing. The base price of a "square" is $1,100, regardless of the area of the property under construction and its location on the floor. The minimum amount of investment in this project is $31,000 - this is how much the future apartment with an area of 41.22 square meters, located on the 4th floor (at a promotional price), is estimated to be. A similar apartment at the basic price will cost about $45,000. Payment is possible in installments from the

developer - the first installment must be at least 25%, and it must be paid in full within a year (Fig. 2.12).

Fig. 2.12. Pricing policy for apartments in the PushaHouse residential complex

Source[49]

The progress of construction is shown in Fig. 2.13.

Fig. 2.13. Construction progress of the PushaHouse apartment building

Source[49]

They promise to complete the construction of the PushaHouse residential complex in the 4th quarter of 2022.

The construction of the complex is planned to be carried out on a plot of land with cadastral number 8000000000:85:112:0002 (Fig. 2.14.0. It

is in communal ownership, and its purpose is 02.07 "For another residential building for the construction of a residential building with built-in public and commercial premises destination and underground parking."

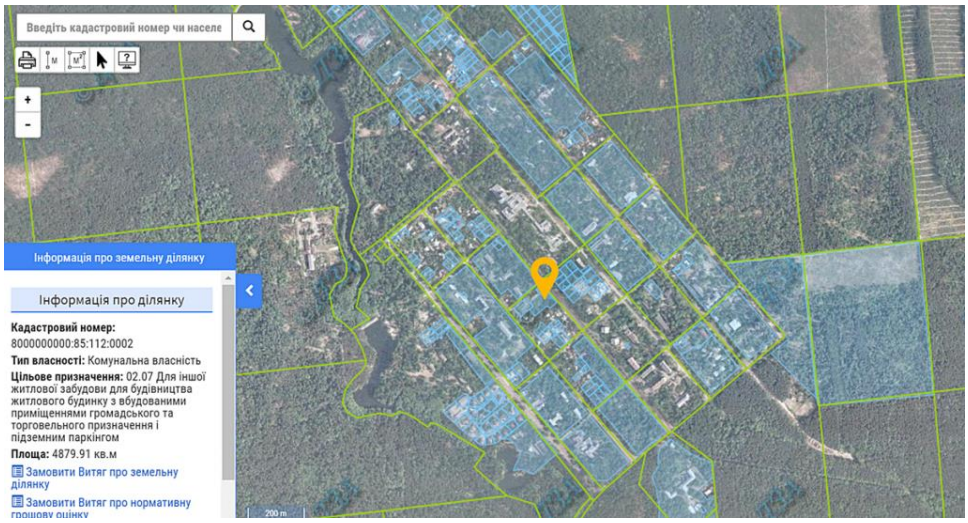


Fig. 2.14. Building plot in the Cadastral map

Source[49]

However, the term of the lease agreement for this plot has already expired (in 2013) - and as far as I could find out, it was never extended, the representatives of the developer said that the lease agreement for the plot was extended. In 2017, the Standing Commission on Land Use decided to extend the lease agreement for the plot with "InTeCo" PE, and in 2019, the corresponding document was signed and registered by a notary public (Fig. 2.15)


ДОГОВІР
про поновлення договору оренди земельної ділянки

КИЇВСЬКА МІСЬКА РАДА
VIII СКЛИКАННЯ
ПОСТІЙНА КОМІСІЯ З ПИТАНЬ МІСТОБУДУВАННЯ, АРХІТЕКТУРИ ТА ЗЕМЛЕКОРИСТУВАННЯ

Протокол № 23
засідання постійної комісії Київської міської ради з питань містобудування, архітектури та землекористування

УХВАЛИЛИ: *1. Поновити* ПРИВАТНОМУ ПІДПРИЄМСТВУ «InТеКо» *на 5 років* договір оренди земельної ділянки від 29.12.2009 №78-6-00612 площею 0,4880 га для будівництва житлового будинку з вбудованими приміщеннями громадського та торговельного призначення і підземним паркінгом на вул. Федора Максименка, 7 (літера «А») в Оболонському районі м. Києва.

2. Департаменту земельних ресурсів виконавчого органу Київської міської ради (Київської міської державної адміністрації) підготувати додаткову угоду щодо поновлення договору оренди земельної ділянки від 29.12.2009 №78-6-00612 на 5 років та привести умови договору у відповідність до законодавства у порядку, передбаченому рішенням Київської міської ради від 26.04.2017 №241/2463 «Про затвердження Порядку набуття прав на землю із земель комунальної власності у місті Києві».

ПРОГОЛОСУВАЛИ: «за» – 16, «проти» – 2 (Картавий І. Л., Назаренко В. Е.), «утрималось» – 2 (Турець В. В., Римаренко С. Г.).

Депутат Київської міської ради Балицька О. С. участі в голосуванні не брала.

Рішення прийнято.

Fig. 2.15. The plot lease agreement and the decision of the commission

Source[49]

2.3. Assessment of company and project management at all stages of the life cycle

However, in a changing business environment, even a successfully operating management system may at a certain point in time be unsuitable for effective functioning. Precisely for the purpose of diagnostics for compliance with the ever-growing requirements of the market, it is advisable to carry out its systematic evaluation with further improvement. Accordingly, the formation of an effective management system requires the use of an adequate approach to its evaluation, which will allow identifying problem areas and gaps in the management system with their further elimination and increasing the efficiency of enterprise management in the future [50].

Effective management is a set of actions and decisions made by management that lead to the development of specific strategies designed to help the organization achieve its goals. The main goal of management efficiency is the development of a new strategy, as a result of which the organization and its activities will correspond to the external environment. Dependence on the external environment imposes on the management of the organization an obligation in relation to the surrounding society to help the structural unit to fulfill these obligations.

It is worth noting that the evaluation of the effectiveness of the company's management system involves the process of information and analytical support of the company's activities and forms the basis for making management decisions in order to determine strategic, tactical and operational goals.

The purpose of diagnosis is to draw conclusions that are focused on the managerial actions of management regarding the investment of resources in business development, as well as in improving the management of a construction enterprise [52,53].

Criteria (1, 2, 3, 4, 5, 6) conventionally characterize the group of "opportunities" of the construction enterprise. Evaluation according to the group of "possibility" criteria is carried out on two aspects: perfection and completeness of the management of the construction enterprise (Fig. 2.16.)

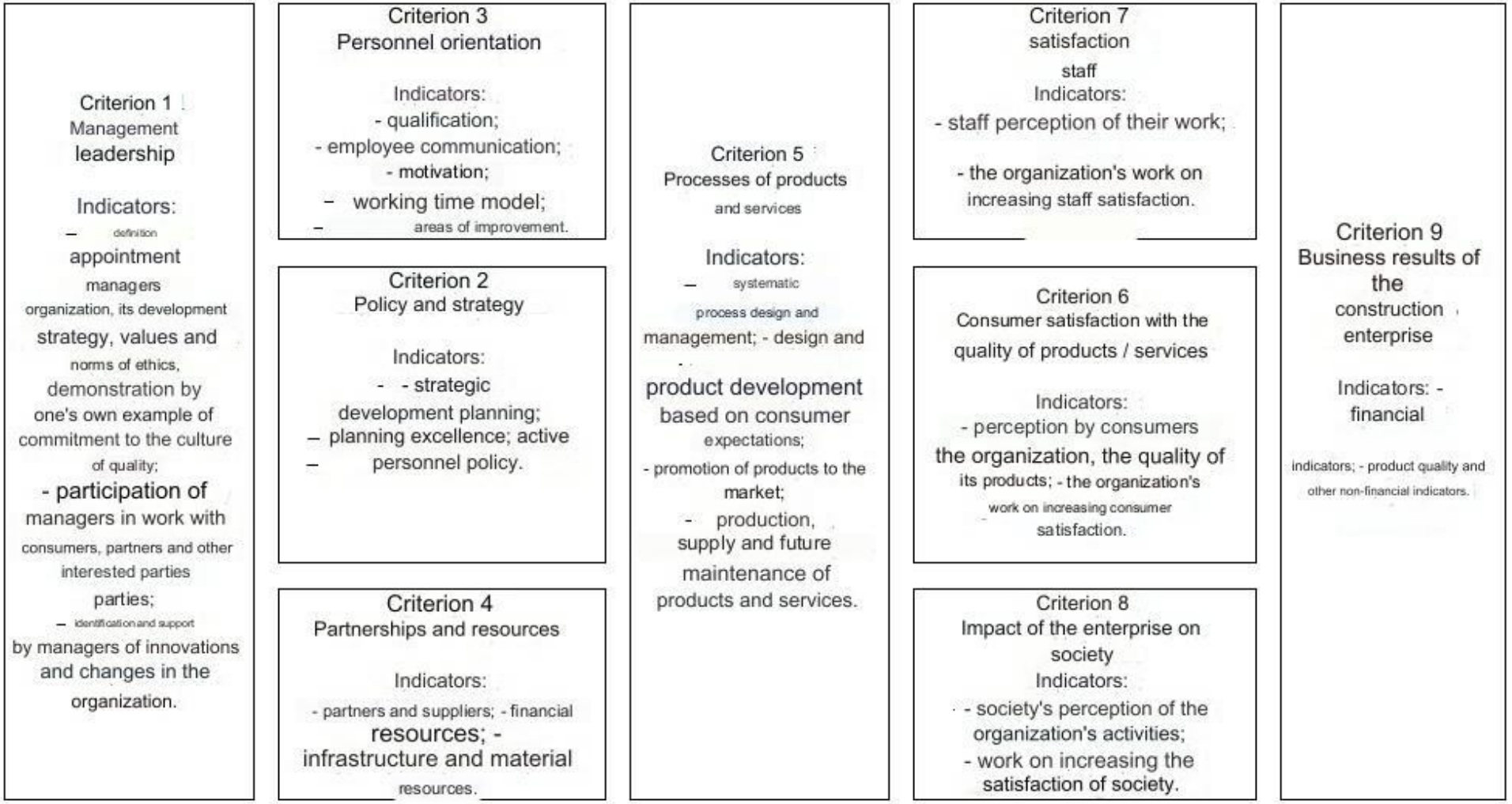


Fig. 2.16. Management criteria of "KBD" LLC*Source[compiled by author]*

Using the information given in the table. 2.6, conclusions based on the results of diagnostics are summarized, it is determined - at what level of development (maturity) is the management of the construction enterprise.

Table 2.6.

Maturity levels of construction enterprise management

Level	Number of points	Characteristics of the level of development/maturity
1	2	3
I	(0–20)	"Uncertainty". Management is conducted unsystematically, goals are not defined, or are very vague. For further development, it is necessary to fundamentally revise the principles of conducting business.
II	(21–40)	"Awakening". The management system has potential for development, but these opportunities are poorly implemented. The management needs to take the initiative, clearly define the goals and develop a strategy for the development of the management system based on quality.
III	(41–60)	"Awareness". The management system in the organization was formed. It is necessary to emphasize the optimization of the business process and the improvement of quality at each of its stages. When improving the management system, the importance of the consumer and the importance of the staff should be taken into account.
IV	(61–80)	"Wisdom". Continuous improvement of management quality is being carried out in most directions. It is necessary to maintain the dynamics improvements and begin to transform remaining problem areas using benchmarking and other improvement strategies.
V	(81-100)	"Confidence". The maximum results were achieved in all areas of management activity, the management system is a benchmark.

Source[compiled 54]

The results of diagnosing the management quality of "KBD" LLC are shown schematically, where the II level of maturity ("awakening") can be traced, that is, the

management system has the potential for development, but these opportunities are realized weakly and inefficiently (Fig. 2.17).

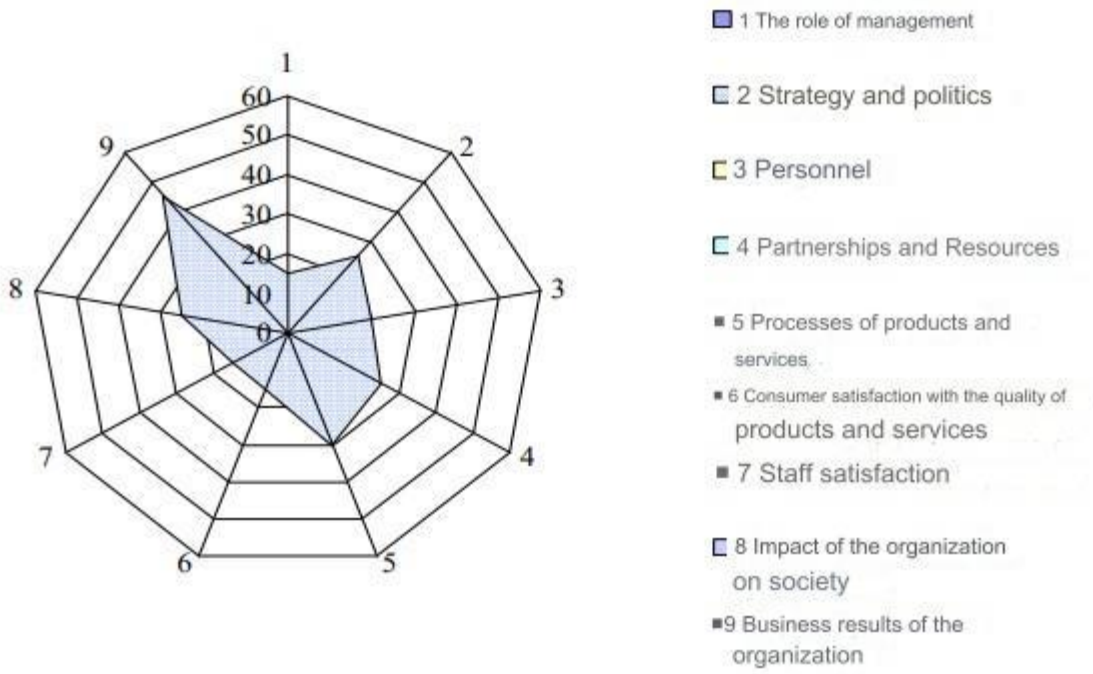


Fig. 2.17. Results of diagnostics of the management of KBD LLC

Source[compiled by author]

The general management of the company is at a relatively low level, we will consider the effectiveness of the management of the PushaHouse residential complex project further.

"KBD" LLC should be considered as "an enterprise with a specific multi-project operating system, the operational, production and economic and management activities of which are aimed at the implementation of the functions of resource manager, microenvironment and project administrator as part of an aggregate portfolio, as well as providing within the framework of individual projects to the customer (together with its co-investors) of competitive services at individual stages of the cycle of the construction and development project (Table 2.7), from the agreement of the investment plan and the substantiation of the primary concept for its implementation (at the feasibility study level) to the turnkey delivery of the object, its sale on the real estate market and further management (operation).

Table 2.7.

Elements of management of the KBD development company by phases and stages of construction and development project implementation

Table 1 - The format of the activity of the developer enterprise by phases and stages of the implementation of the construction development project

№	Name	Content
A.	Phases and stages of the construction development project	
I	Pre-investment phase of the construction development project (PDB)	
I.1.	Pre-project stage	Development of an idea (investment plan); investment analysis of the real estate market; development of alternative complex concepts and business plans; analysis of investment feasibility and marketing advantages of developed territory development concepts; selection and preliminary negotiations with institutional subjects of the project. Formation of the environment and content of the interaction between the developer and the customer (development of the components of a long-term development agreement according to the stages of the PDB).
I.2.	Acquisition land plot	Search and evaluation of the land plot; acquisition of the right to possession or long-term use of a plot of land (purchase or lease).
I.3.	Compilation and coordination stage project-estimated documentation and selection of performers project	Development and coordination of the initial feasibility study, according to the investment plan and the initial concepts of the project. Development and coordination of financing schemes (project investment and lending); formation and coordination of primary options of budgets for the stages of the project cycle. Formation of a project administration team within the organizational structure of the developer company (with the possible involvement of third-party specialists for temporary cooperation). Design management, drawing up and coordination of PCD, holding a tender for construction works. Assessment by the developer of the reliability of the executing enterprises (subcontractors) and their subsequent selection in the tender process.
II.	Construction phase or the phase of creating the functional and investment value of the PDB	
II.1.	Preparation for implementation of PDB near-object structure developer	Creation of a temporary project administration structure. Organizational and technical, geodetic and technological preparation of construction. Resource and logistics preparation of the project. Coordination of project implementation schedules and budgets between all institutional participants, their processing by divisions and levels of the developer's OSU, bringing the developer's imperatives to the level of the near-object structure.
II.2.	Construction, its budgetary and technical control	Construction of the object according to the plan-schedule and construction budget. Control of the functional quality of construction. Budget control.
II.3.	Commissioning	Preparation for implementation. Prompt elimination of deficiencies identified by the developer and the DPK. Implementation. Operational phase of
III.	the PDB	
III.1	Stage of promotion of the real estate object	Development of the basics of marketing strategy and pricing policy. Assessment of potential obstacles to the economic and productive operation of the project. Conducting an advertising campaign.
III.2	Management and implementation stage results	Return of loans to commercial banks, raised funds to investors. Sale or lease of the real estate object (for commercial residential construction, the sale can be carried out in parallel with the construction).

Table 2 - Components of the general methodological basis of activity developer enterprises in construction

№	Names of substantive and procedural components	The content of the components in the format of the presented methodological platform
1	2	3
1	Basic approaches of economics and management enterprises, which are expedient to combine B in the methodological composition platform (MP -OD- PDB) of the operating room activities of the developer in construction	Structural-process, project-oriented (target), situational and image approaches, management by objectives (MVO), the concept of Keu Performance Indicators and compliance management, functional and economic diagnostics of enterprises (FED), modern X-engineering methodology as a productive basis for the formation of operational systems and organizational structures of enterprise management.

134

Source[compiled by author]

Taking into account the modern vector of renewal of construction development, the substantive and procedural components of the general methodological basis of the activity of the developer company "KBD" have been determined (Table 2.8.)

Table 2.8.

Components of the general methodological management approaches of the KBD development company

№	Names of substantive and procedural components	The content of the components in the format of the presented methodological platform
1	2	3
1	Basic approaches of economics and management of enterprises, which are expedient to combine as part of the methodological platform (MP OD-PDB) of the operational activity of the developer in construction	Structural-process, project-oriented (target), situational and image approaches, management by objectives (MVO), the concept of Keu Performance Indicators and compliance management, functional and economic diagnostics of enterprises (FED), modern methodology of X-engineering as a productive basis of formation operating systems and organizational structures of enterprise management.
2	Strategic direction of the methodological platform in terms of management approaches and formalized decision-making methods	2.1. Attuned to the multi-component essence of the operating system (OS) of the enterprise-developer in construction (PDB), the – methodological platform and the scientific and applied toolkit created on its basis should ensure the ability of the PDB OS to implement the regulatory and directive requirements of institutional participants for each construction project included in the economic the developer's project portfolio (GPPD).
		2.2. Preventive-precautionary components of the methodology should be aimed at early assessment (diagnosis) of achieving compliance in the "pre-start-project" format between: a) the strategy of the developer company; c) the economic and functional-product structure of projects within the GPPD; c) the dynamics of creating the value of project products; e) the expected volume of financial results from the administration of projects by the developer on the projects separately and in general, in relation to the expected level of achieving a sufficient-satisfactory level of profitability and economic balance of the developer as a participant in the construction investment market.
3.	Ensuring productive formalization and successful informational and program implementation of the content of the methodology in the administration of the life cycle of PDB activities	2.3. Adaptability to VIM technologies (Building Information Modeling), Eurocodes IFRS (International Financial Reporting Standards), BSC format ("Balanced Scorecard") and modern tools for administration of investment and budgeting of construction projects, which as an information base will allow to successfully formalize the characteristics individual projects as part of the GPPD, structure them according to the content of the implemented stages of administration in the projects, and further coordinate their implementation according to the aggregated resources of the multi-project environment.
4.	Multi-aspect and multi-indicative basis for forming the composition of the project portfolio (GPPD)	On the basis of the methodological platform introduced in the work, the combination of innovative tools for the formation of a business portfolio (GPPD) with a fundamentally updated system of business indicators of the functioning of the operating system, which reflect the accumulation of material, financial and human resources within the limits of a multi-project economic portfolio and their direction to the agreed achieving investment and construction goals.

Source[compiled by author]

The management of KBD LLC made a decision to implement measures to transform the management system in the conditions of digitalization of the economy (Fig. 2.18.)

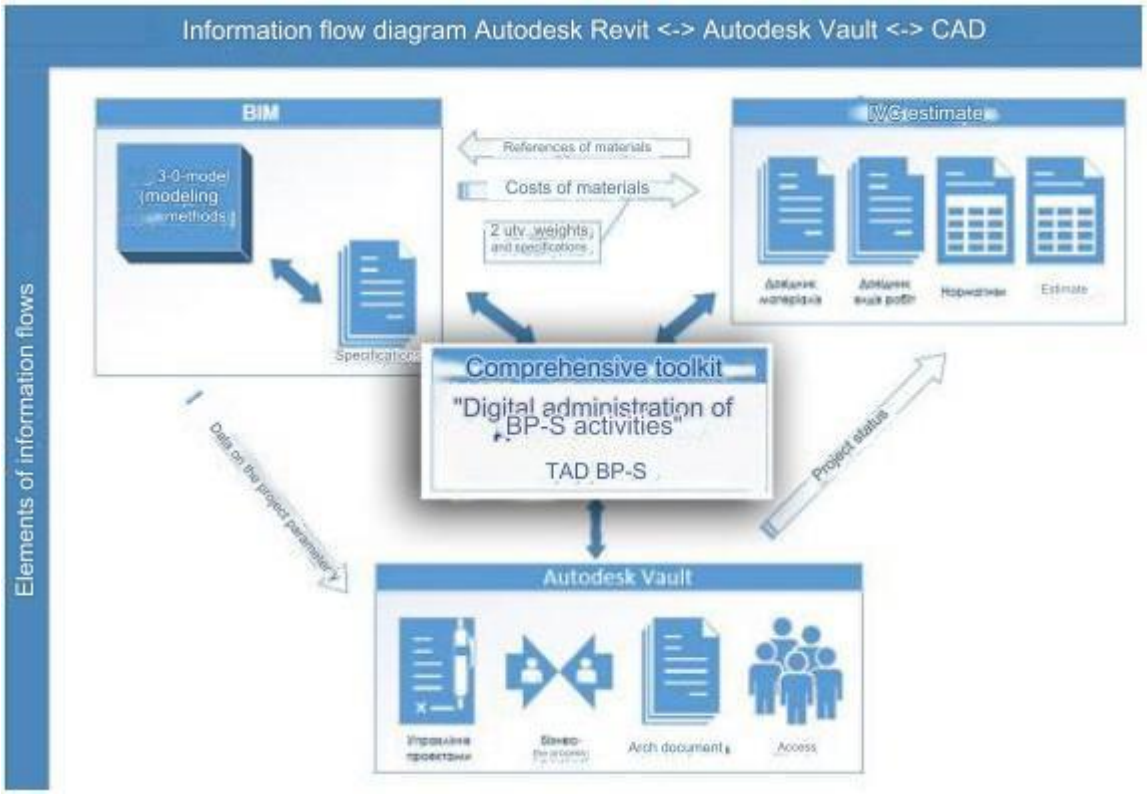


Fig. 2.18. Visualization of economic interaction in the production digital platform of KBD LLC

Source[compiled by author]

In economic science, there are a number of concepts of formation and management of business processes, but complex ones are considered the most effective. Therefore, it is advisable to review the main ones, those that use system and process management approaches. The management scheme for the innovative development of the enterprise's business processes is presented in fig. 2.19.

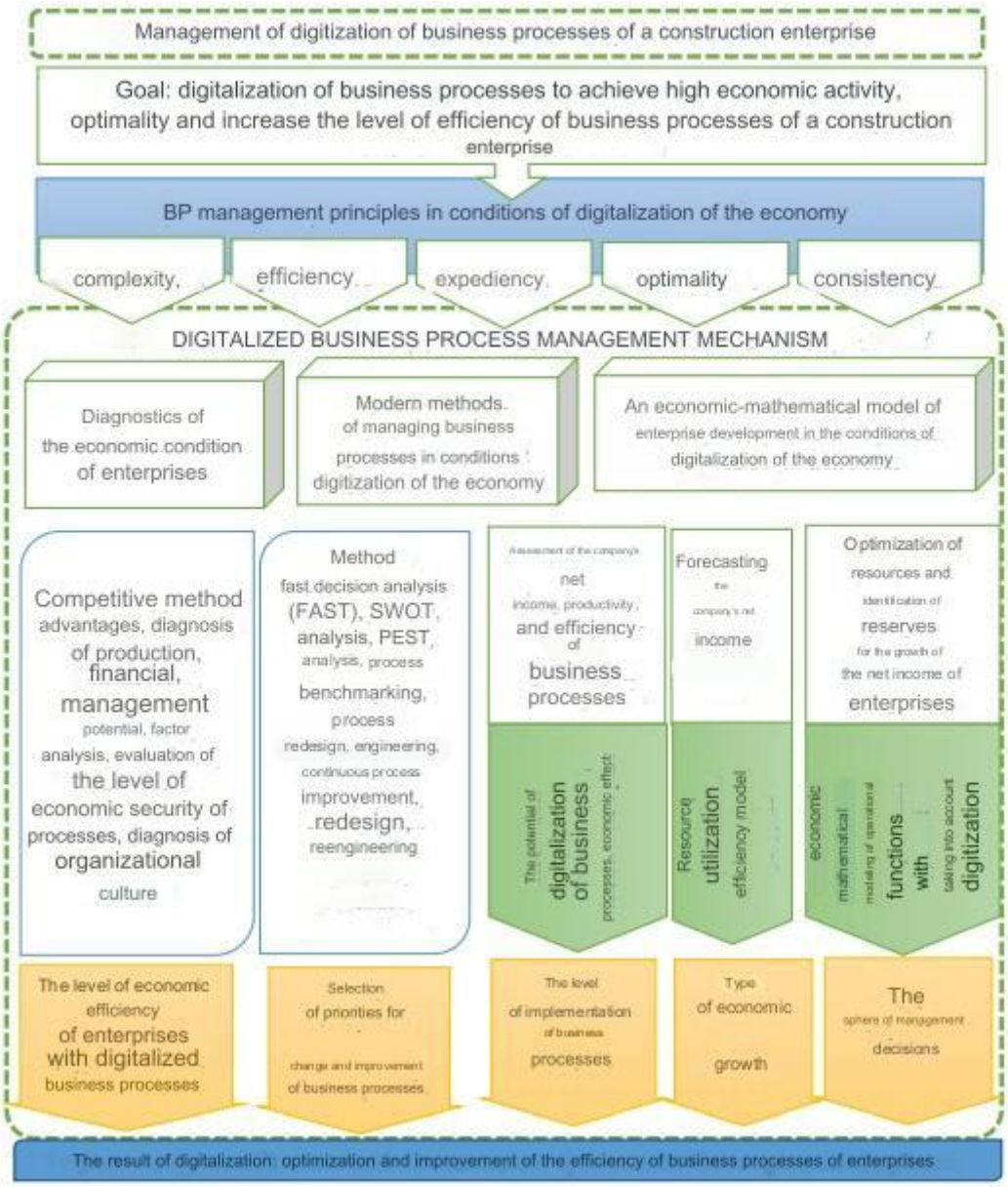


Fig. 2.19. Components of the management system for digitalization of business processes of the construction company "KBD" LLC

Source[compiled by author]

By the target strategy of transformation we understand the implementation of a set of goals, reengineering of the management structure and operational management system. Realization of digital potential based on changes in the structure and expansion of resource capabilities of the economic system, adaptation of its internal state to the conditions of digitalization make up the content of the financial strategy.

The impact of digitization of management functions on the indicators of the enterprise's production activity is shown in Table 2.9.

Table 2.9.

The impact of digitization of management functions on the indicators of the enterprise's production activity

Management function	Digital format | management functions in the conditions of the transition to VIM and Industry 4.0	Priority in finding promotion reserves efficiency	Impact on production indicators
Planning	Modeling scenarios of enterprise development; integrated planning of activity indicators	Search the most an effective version of the plan, taking into account the achievement of a set of goals	Increase in volume issue, profitability i product quality
Organization	Simulation business-processes B real time; exchange of data, knowledge and experience B real time mode between geographically scattered participants of production process	Prevention unproductive mode conflict, loss interests, production incidents, above-standard costs, increased risks	Decrease operational costs, volume above-standard payments, expenses for reimbursement losses from risk
Coordination	Platform methods coordination of activities of participants chain methods; coordination robotic and living labor	Installation uniform requirements to of all participants of the entire creation of the chain value value creation; harmonization of all types of work	Growth quality products and labor, reduction production cycle, cost reduction
Motivation	Stimulation staff by results of CRI reports, B which takes into account the implementation of measures for digitization of activities enterprises	Orientation for staff at process digitization activity enterprises	Increasing quality work, reduction terms digitization production
Analysis CONTROL	Preventive diagnostics equipment condition; monitoring losses productivity equipment and personnel; analyze information on the production indicators activity B mode real time	Early detection and elimination of deviations from the plan; development of warnings measures to ïx prevention of B future periods	Reduction (exception) cases failure planned tasks, cost reduction for development of measures regarding the adjustment plans

Source[compiled by author]

At the same time, it is noted that BIM is the most effective when working in a joint environment of all participants of the object's life cycle and is part of the complex process of construction and operation, which requires the existence of a single digital space for all subjects that form the TR system in construction (Fig. 2.20.) .

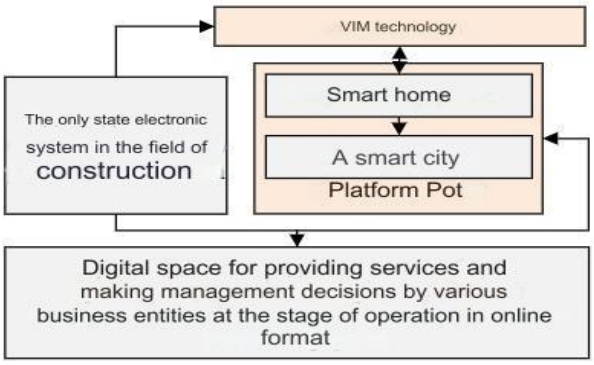


Fig. 2.20. Digital basis of a comfortable living space KBD LLC

Source[compiled by author]

When making management decisions regarding the initiation of construction of the PushaHouse residential complex, the following sequence of actions was used for (Fig. 2.21.)

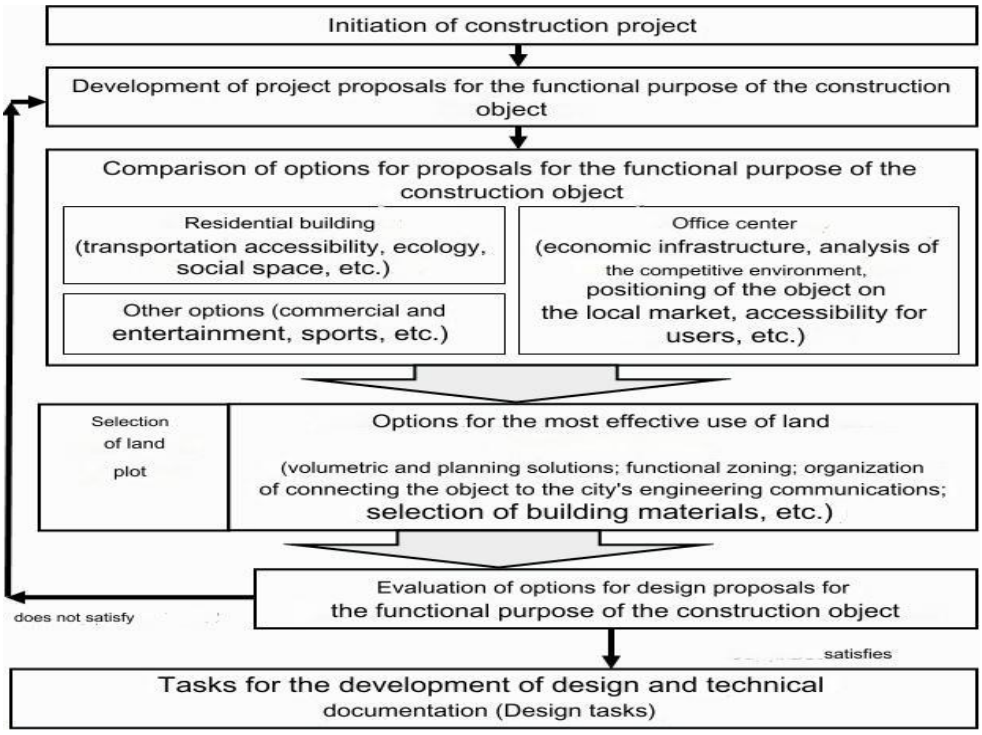


Fig. 2.21. Information model of the formation of the feasibility study of the construction project of the Pusha House apartment building

Source[compiled by author]

To solve the task of finding the "best use" of the land plot for the PushaHouse residential complex project, a logical and structural sequence of actions was followed (Fig. 2.22):

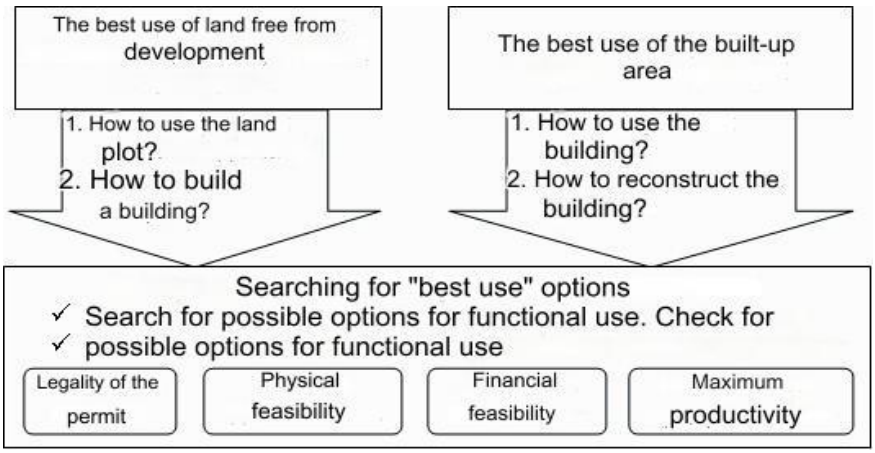


Fig. 2.22. Logical and structural sequence of the search for the "best use" of the land plot for the PushaHouse residential complex project

Source[compiled by author]

The information model for the formation of the technical and economic justification of the PushaHouse residential complex project took the form of a "decision support structure for choosing the best option for the construction object" (Fig. 2.23).

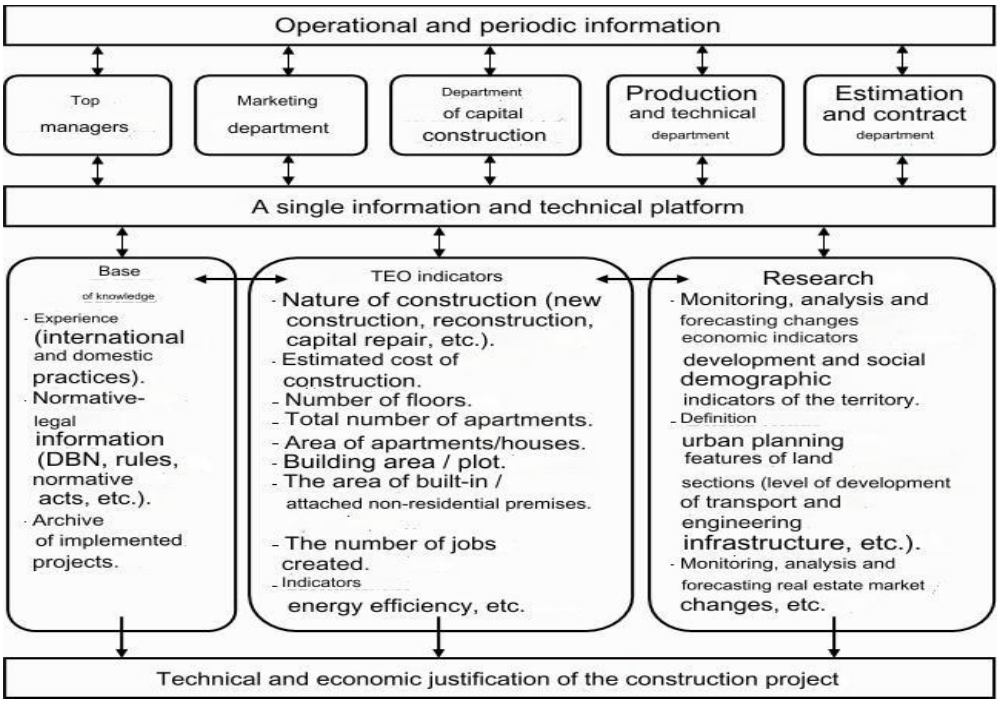


Fig. 2.23. Decision support scheme for choosing the best option for the construction object (PushaHouse residential complex)

Source[compiled by author]

The information support of the PushaHouse residential development project includes: first, the logical and structural sequence of the search for the "best use" of the

land plot; friend, a decision support scheme for choosing the best option for a construction object.

The core of the digital transformation of updating the functional and production subsystem of KBD LLC is BIM (BuildingInformationModeling), which is a set of technologies, processes, software and tools for joint design, coordination of construction works, prototyping of construction objects and modeling of the construction process of buildings and structures throughout construction cycle, as well as the life cycle of the construction object (Fig. 2.24.)

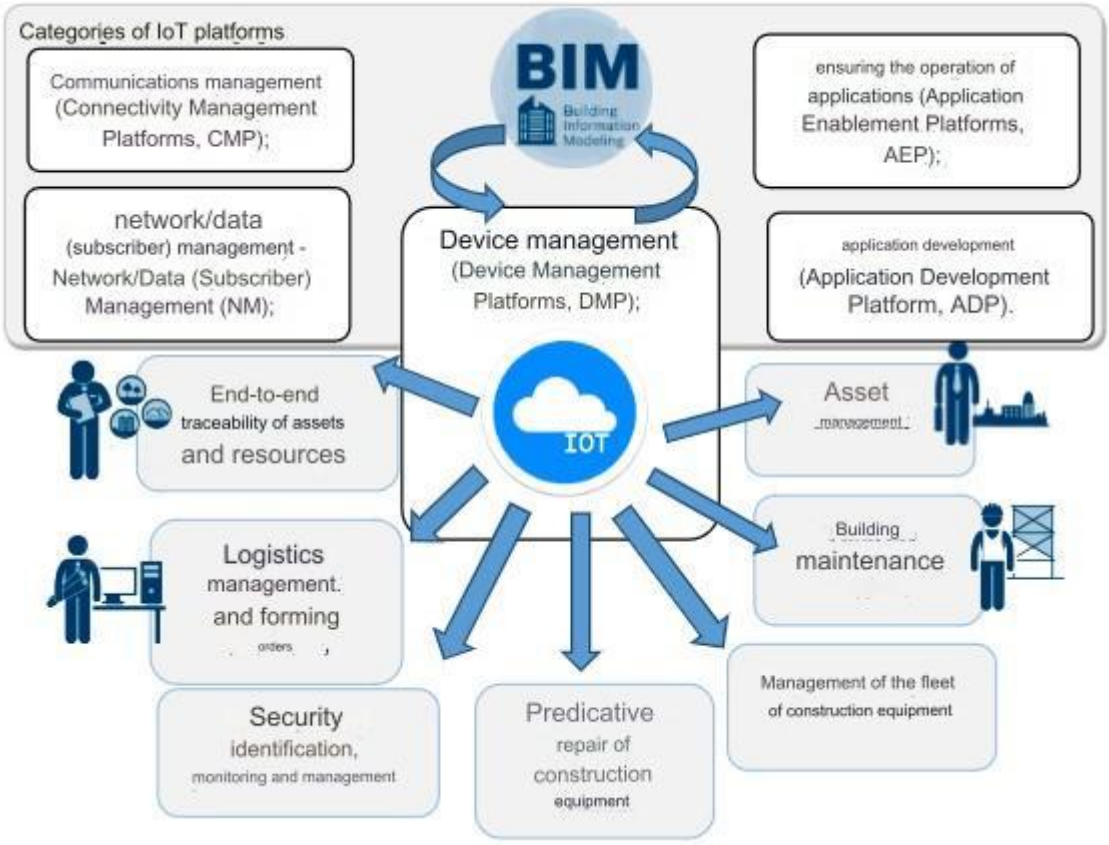


Fig. 2.24. Subsystem of formalized adjustment of decisions regarding the project of digital transformations of the operating system and management of KBD LLC on the basis of IoT cloud platforms and BIM technology

Source[compiled by author]

Having studied the main aspects of the management of KBD LLC, we can come to the conclusion that the principles of standardization, specialization, hierarchy, control and the primary importance of the interests of the owners of the organization are

insufficient to solve the specified tasks. In order to move forward, the managers of KBD LLC must first of all realize the need for overdue changes. This requires the courage to go beyond familiar frameworks and objectives that challenge and stimulate the search for radically new ways of mobilizing and organizing human capacities. The modern management model of "KBD" LLC should represent a holistic integrated approach to management in order to increase its financial indicators and gain a foothold in the real estate market as a leader, increasing its competitiveness.

CHAPTER III. WAYS OF OPTIMIZING THE EFFECTIVE MANAGEMENT OF A CONSTRUCTION ENTERPRISE

3.1. The use of a situational approach based on the principles of environmental management to meet the conditions of sustainable development and increase the efficiency of the construction enterprise

Many large public and private companies inform about their contribution to sustainable development. Finally, public opinion is increasingly aware of the problems arising from the protection of the environment and natural capital. The schematic transition to the concept of "sustainable development" is illustrated in fig. 3.1.

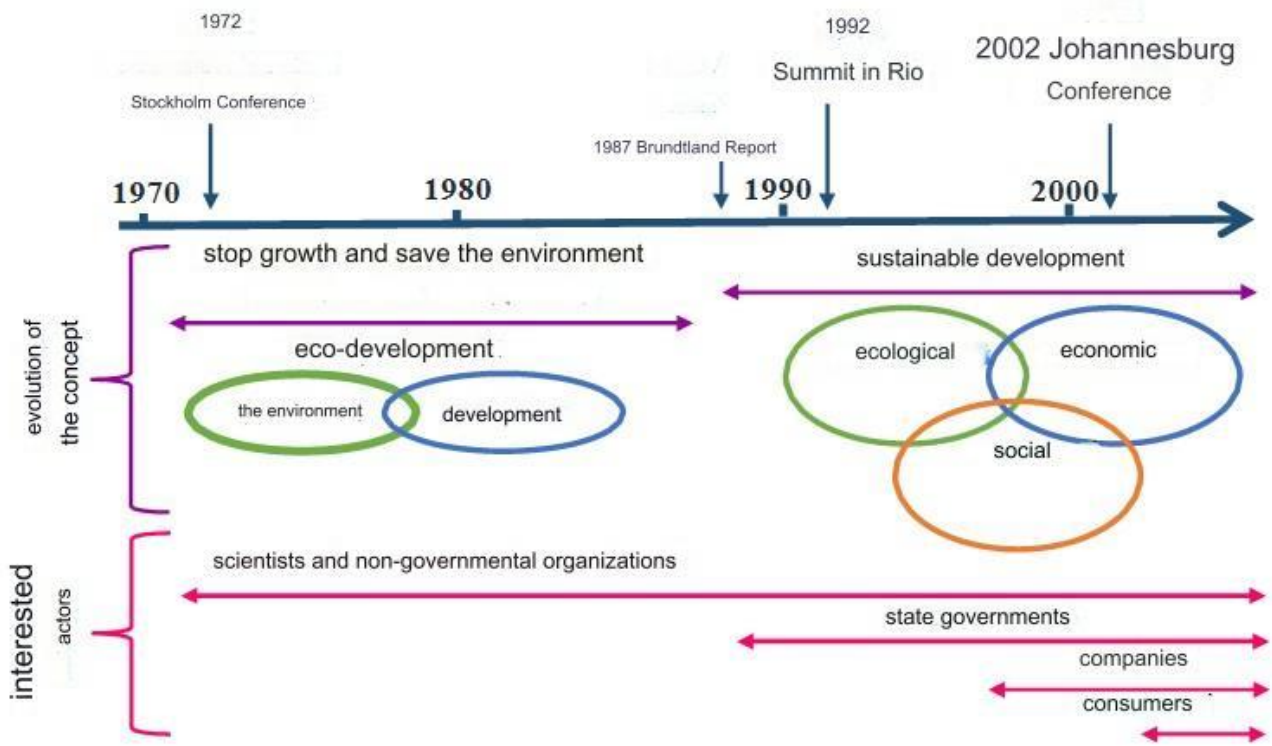


Fig. 3.1. Schematic transition to the concept of "sustainable development"

Source[compiled by author]

This perspective takes a "fair" approach to time and questions of justice: resources - economic, environmental or social - should be used and distributed fairly between generations.

Table 3.1 shows a generalized matrix of values with regard to the sustainable development of a construction enterprise and the implementation of the principles of marketing 4.0.

Table 3.1.

Matrix of values of the construction enterprise

	Mind	Heart	Soul
Mission: Formation of new conditions of life and work, taking care of the environment environment.	The criterion of the life cycle of a building object is the reduction of its operating costs.	Use of renewable energy. Construction of smart houses	Providing an individual approach to the client, using IT technologies of the new wave
Vision: Use innovative solutions, ecological materials, ensure a comfortable and healthy life in urban and rural environments	Maintaining a balance between increasing the profitability of construction and ensuring the aspirations of customers	Protection of the ecosystem, beautification of the environment of the building	Comfort of residents, health care, provision of acoustic insulation in buildings, certification of buildings
Values: Responsibility We create economic value, ensure the use of renewable energy sources, participate in corporate responsibility programs	Development of employee competencies for the purpose of using innovative technologies in construction	Use of employee ethics programs and corporate oversight of the construction process	Training, motivation, communication, continuous improvement

Source[55]

The development of the matrix of values ensures the sustainable development of the enterprise in the long term, has an impact on the formation of the needs of customers, own employees, investors and ensures an increase in the level of competitiveness of the enterprise.

Modern requirements for the project of a construction object should include the environmental aspect, the cost of construction works, the operating costs of the building, as well as minimize the negative impact on the natural environment. The issue of assessing and monitoring the state of the environment deserves special attention when building a development management system. Development activities directly affect the environment through construction, improvement, management of various types of real estate in different segments of the real estate market.

We characterize the cause-and-effect relationship between the implementation of development projects and changes in the environment (Table 3.2).

Table 3.2.

Causal relationship between the implementation of development projects and changes in the environment

n/a	Reasons	Consequences
1.	Use of land acquisition	Ecological effect.
2.	Destruction of the natural environment	Development projects in terms of construction often change the landscape and destroy nature.
3.	Use of natural resources	Use and destruction of natural resources. Destruction of forests, fields, etc.
4.	Energy consumption	Construction is associated with a significant level of energy use both during production processes and when using the final product.
5.	Health care and occupational safety	By its very nature, construction is accompanied by a certain level of risk both for the workers employed on the construction site and for the local population.
6.	Violation of comfort	The most well-known violations of comfortable conditions that the local population faces during the implementation of any construction project are noise, – dust, garbage, pollution of land, air and water, as well as heavy traffic. Waste is
7.	Waste	generated as a result of extraction of raw materials, its preparation for use in the construction process, delivery to the construction site, improper storage, manual operations, and use of materials at the stage of performance of works. All these processes are sources of large volumes of construction-related waste.
8.	Waste dumping and water pollution	Construction technological processes often lead to the escape of pollutants and their descent with the help of natural watercourses and artificial drainage systems.
9.	Use of water resources	A by-product of any construction is the growing need for water supply. Possible overloading of existing water intakes or the need to build new structures that themselves start a cycle of impact on the environment.
10.	Emissions of environmental pollution into the atmosphere and natural environment	The work process on the construction site contributes to the emission of many hazardous substances into the atmosphere in the form of toxic fumes from heavy machinery, mechanisms and technological processes. In addition, in a built house, for example, there may be many sources of emissions of such substances into the atmosphere.
11.	Formation of abandoned areas	Builders prefer to choose undeveloped plots, leaving many areas of possible development with abandoned construction sites and unnecessary buildings and structures in a ruined state.

Source[56]

We classify the environmental management system into 3 groups according to management levels:

1. legislative;

2. corporate;

3. at the level of each individual project.

Thus, it is possible to propose the construction of a subsystem of management of environmental protection, evaluation and control of its condition (represented in Figure 3.2.) in the development company, which is a structural component of the activity management system.

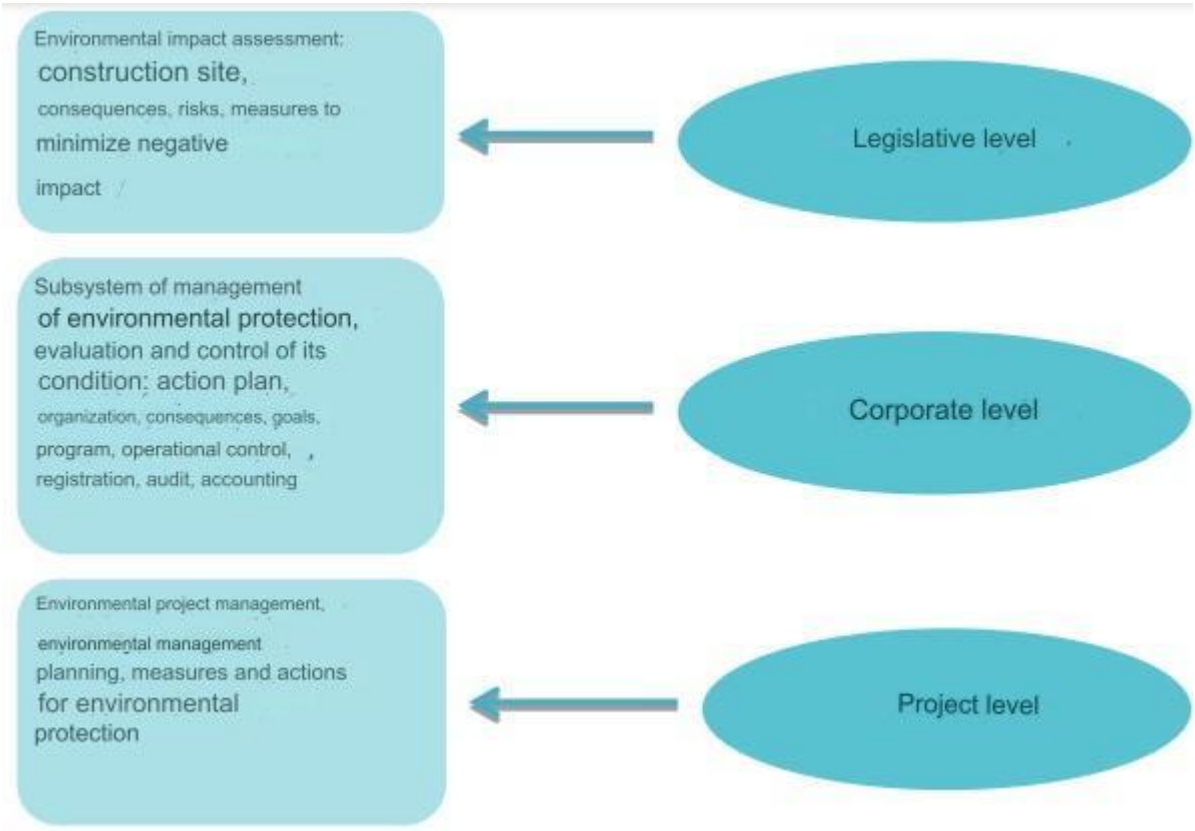


Fig. 3.2. Level subsystems of management of environmental protection, evaluation and control of its condition

Source[compiled by author]

The constructed levels of environmental management subsystems (Fig. 3.2.) fully take into account the fundamental factors of the environmental management system in Ukraine.

The eco-management system in Ukraine is defined, formed and regulated by the Law of Ukraine "On the Protection of the Natural Environment", which was adopted back in 1991. Currently, corrections have already been made to it, which have been handed over to the government of Ukraine. These corrections take into account the legislative provisions of the environmental audit.

Environmental management is a system of managing the activities of an enterprise (organization) in one or another of its forms, directions, and aspects that

directly or indirectly relate to the enterprise's relationship with the surrounding natural environment. The components of environmental management are shown in Fig. 3.3.

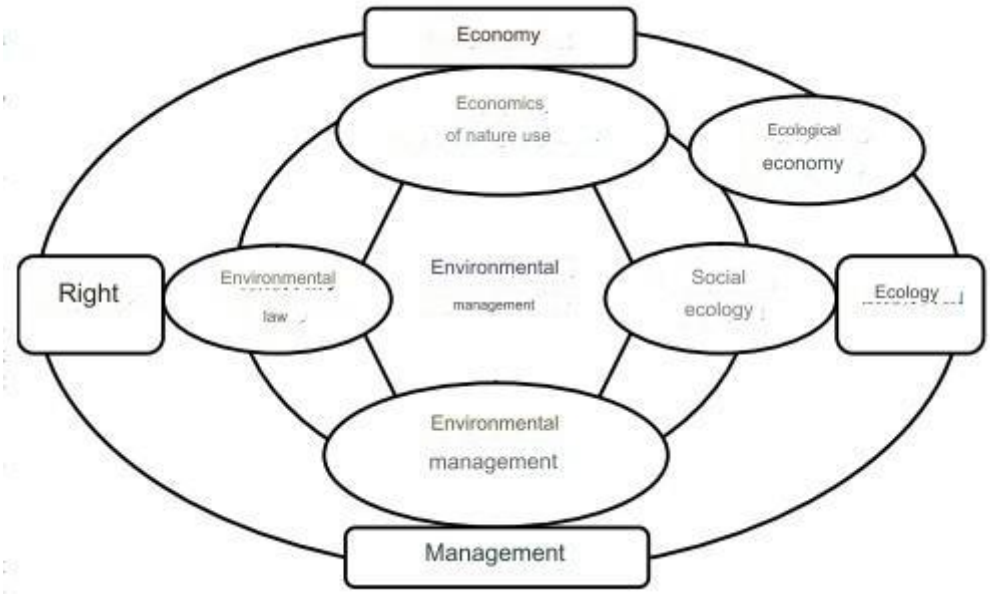


Fig. 3.3. Components of environmental management

Source[57]

It is obvious that with the development of practical activities in the field of environmental management in Ukraine, there will be opportunities to obtain a number of specific advantages in solving various environmental problems. These advantages include new approaches, non-traditional ways and opportunities to overcome negative trends in the development of the environmental situation at the production level.

The main tasks solved by environmental management at the construction enterprise are shown in Fig. 3.4.

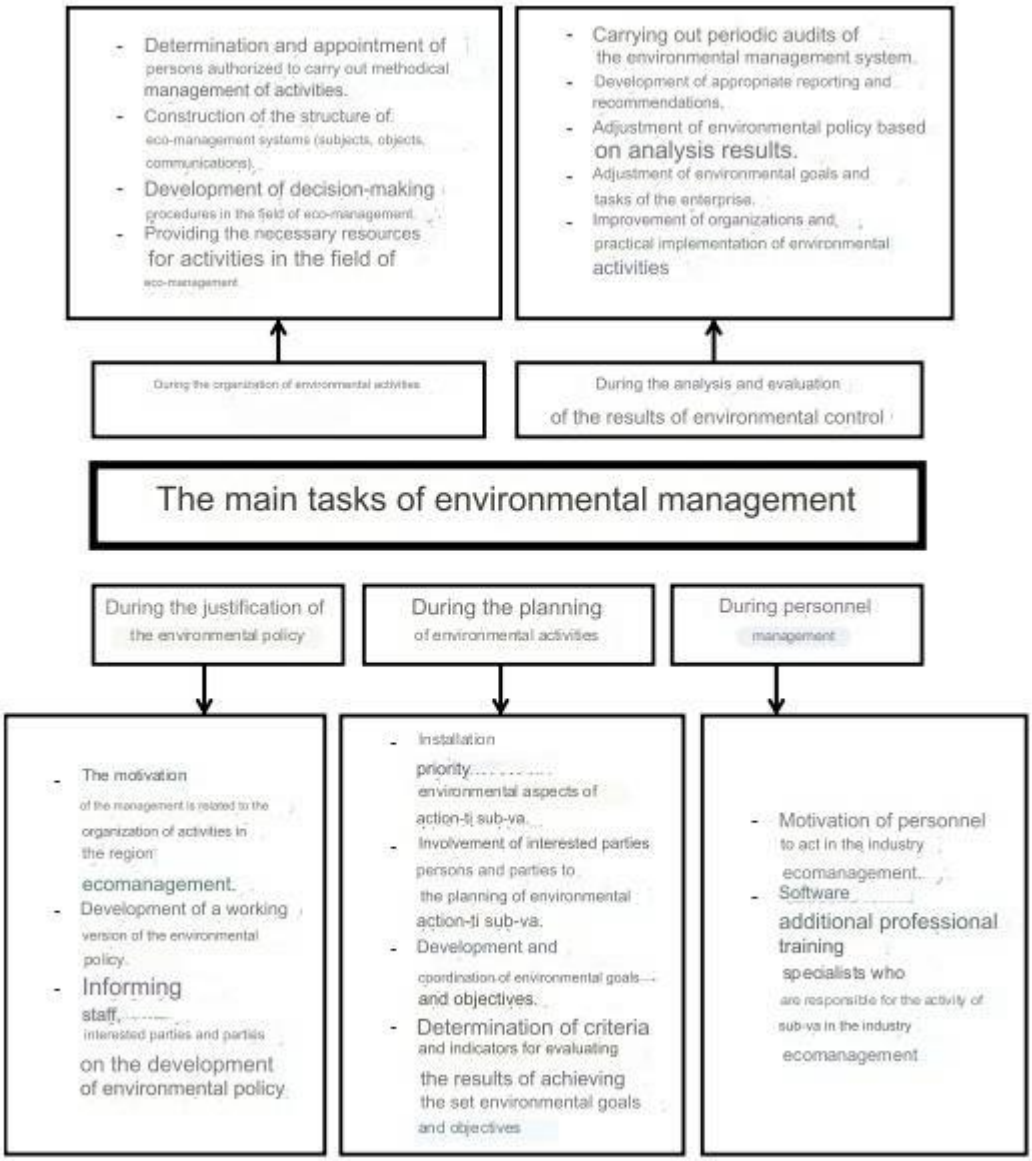


Fig. 3.4. The main tasks of environmental management of a construction enterprise

Source[58]

The implementation and development of environmental management in the practice of enterprise management will affect the improvement of its environmental and economic management, will contribute to the stabilization and development of the construction industry.

Among the existing definitions of ecological and economic management in domestic and foreign literature, the following interpretations can be distinguished [58-67] (Fig. 3.5.).

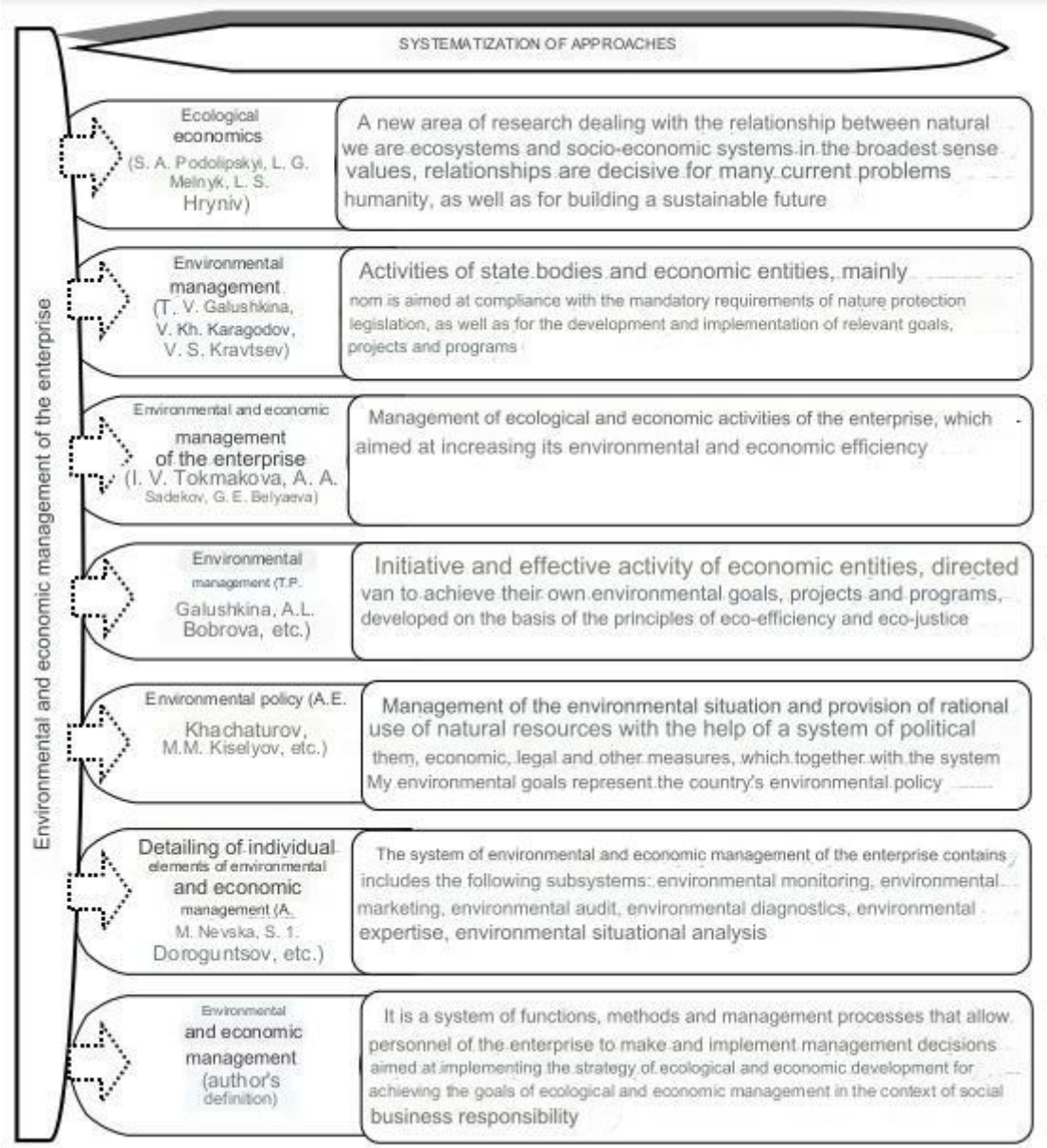


Fig. 3.5. Systematization of scientific approaches to modifications of ecological and economic management of the enterprise in scientific literature

Source[generated by the author]

Modern economic conditions require the systematic use of these approaches to ecological and economic management. An effective mechanism of ecological and economic management requires a combination and modeling of the listed approaches,

and the ratio of approaches to management depends on the situation formed at a certain point in time and on taking into account the specifics of the enterprise's environmental policy (Fig. 3.6).

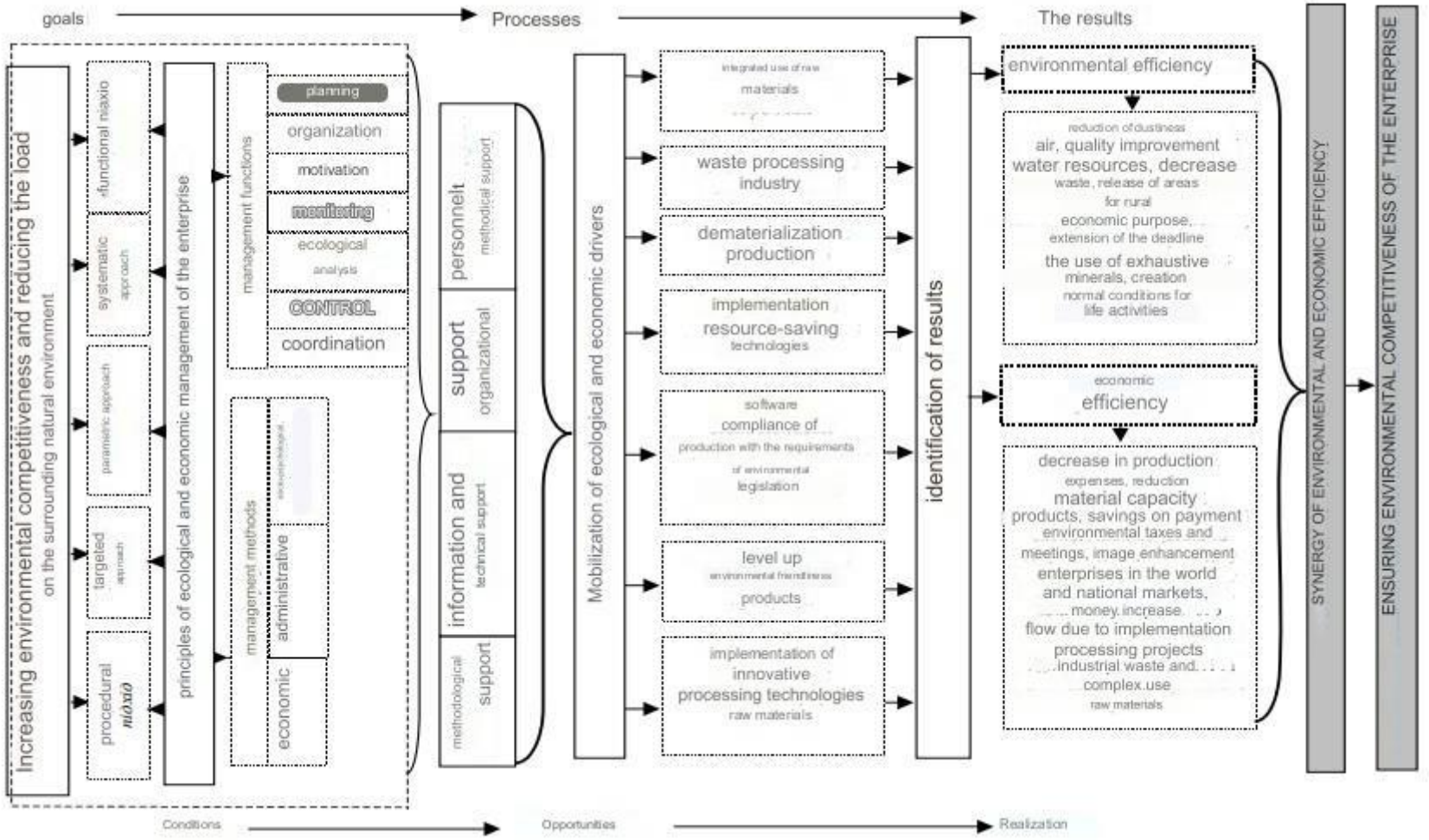


Fig. 3.6. Organizational and economic mechanism of ecological and economic management of KBD LLC

Source[generated by the author]

The most effective at the enterprise and the one with the greatest potential is considered to be the structure that provides for the separation of the environmental service into a separate unit, and its head, according to the position (depending on the size of the enterprise), is equivalent to a deputy director or chief engineer. The structures of the environmental management system of this type have the following advantages:

–the opportunity to most competently, rationally, comprehensively and fully reproduce environmental activities;

–the possibility of a complex combination of the main production and environmental goals and obtaining a synergistic effect;

–the possibility of carrying out various economic and effective environmental activities.

Construction enterprises that take into account economic, social and ethical aspects in their interaction with interested parties, thus increase the level of influence of communication policy on consumers and develop such a function as public relations.

In view of this, based on the systematization of existing scientific views, a classification of environmental strategies of enterprises in the construction industry has been developed and presented, which takes into account the main essential features of greening at the current stage of development, provides a guideline for balancing the environmental, market and economic interests of subjects (Table 3.3.)

Table 3.3.

Classification of environmental strategies of enterprises in the construction industry

№ п/п	Classification feature of the environmental strategy (greening) of the construction enterprise	Type of environmental strategy of a construction enterprise
1	By locality or integration of environmental elements of strategic management	Local environmental strategies. Integrated environmental strategies.
2	According to sources of financing of environmental measures	Environmental strategy financed by equity capital. Environmental strategy financed by state funds budget of different levels. Environmental strategy financed by public-private partnership. An environmental strategy financed by the funds of international organizations, other states under the relevant support programs (for countries with a transition economy, to eliminate the consequences of certain emergency situations, etc.)
3	Depending on the level of economic payback (economic efficiency) and the market value of the implementation of greening	Payback environmental strategies, including profitable (high-profit, medium-profit, low-profit). Unremunerative environmental strategies. Environmental strategies associated with the emergence of market (competitive) advantages Environmental strategies not related to the emergence of market (competitive) advantages
4. By nature of greening		Regulatory environmental strategies. Innovative (initiative) environmental strategies of various types depending on a wide range of target orientations. Mixed environmental strategies (use of regulatory approaches and partial application of innovative approaches)
5	By the degree of participation in the development of environmental strategies	Environmental strategies developed in-house by the enterprise. Ecological developments, created on the basis of the use of other approaches, taking into account the specifics of the industry
6	By the degree of impact on the natural environment	Environmental strategies associated with a high level of impact on the environment natural environment. Environmental strategies related to the average level of impact on surrounding natural environment. Ecological strategies associated with a low level of impact on the surrounding natural environment. Environmental strategies associated with an uncertain level of impact on surrounding natural environment
7	Depending on the functional areas of greening	Environmental strategies related to production, process solutions. Environmental strategies related to the decision in the field of products (services). Environmental strategies related to the management of certain objects (spheres) of management. Comprehensive environmental strategies
8	Depending on the balancing of greening with the economic and market interests of the enterprise (author's development)	Environmental strategies that provide for dynamic changes in achieving the goals of greening (except regulatory parameters) depending on unexpected economic and market fluctuations. Environmental strategies that do not provide for dynamic changes in achieving the goals of greening (except for regulatory parameters) depending on unexpected economic and market fluctuations

Source[68-72]

The presented classification can be used to identify the environmental strategies of modern construction enterprises within the framework of methodological and theoretical justification of the studied issues.

Having studied the modern management mechanism of KBD LLC, it is possible to draw a conclusion about its functional components. Mandatory and interconnected elements of such a management mechanism are: management system; management processes; management decisions; personnel. The simultaneous interaction of these elements leads directly to the movement of the management mechanism in general, which determines the ways to achieve the main management goals. The adaptation of this approach to the operating conditions of enterprises allowed us to form an adapted model of the mechanism of ecological and economic management (Fig. 3.7).

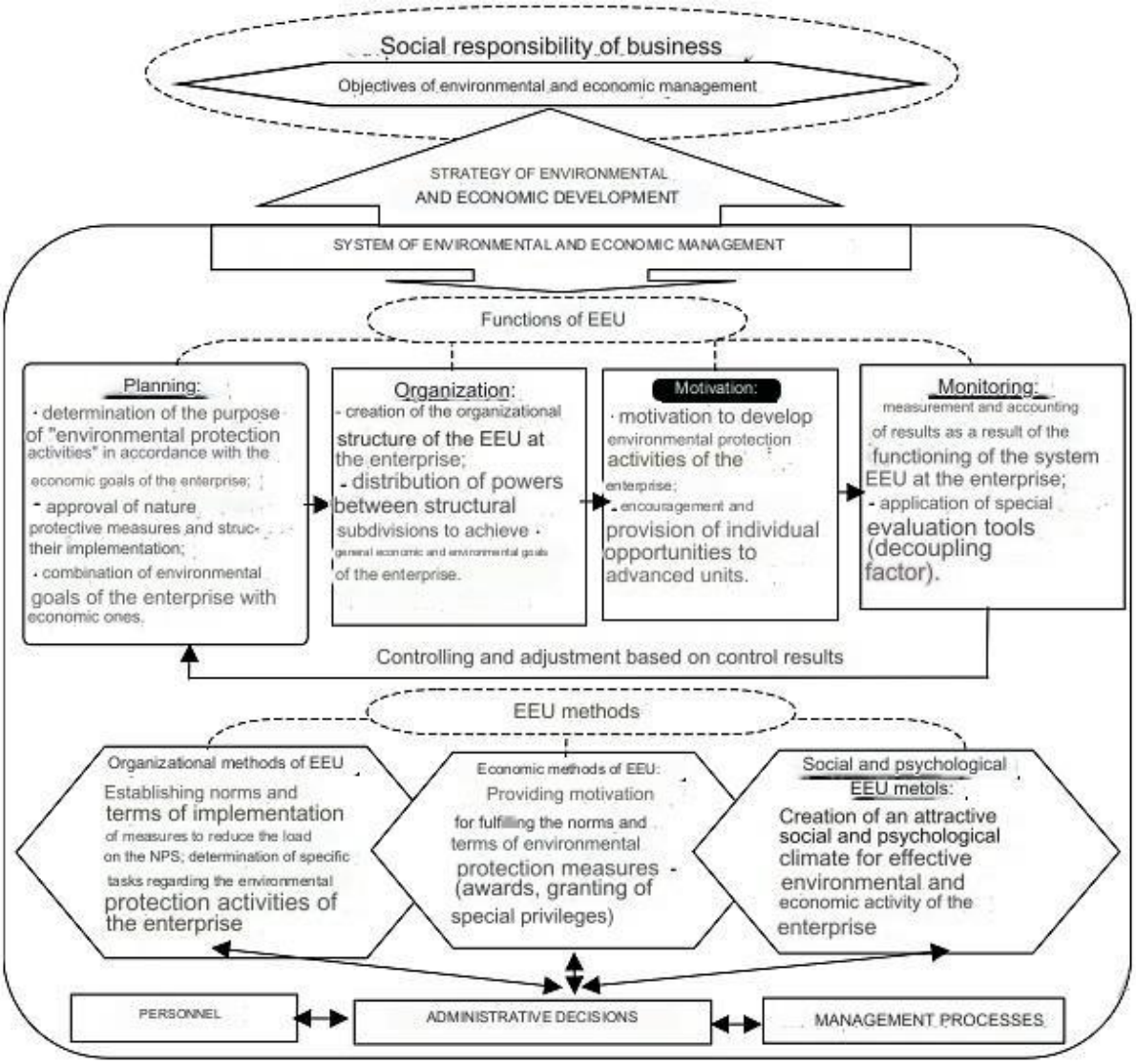


Fig. 3.7. Model of the adapted mechanism of environmental and economic management at KBD LLC

Source[generated by the author]

By the model of the adapted mechanism of the ecological and economic management of the enterprise, we understand the model in which, as a result of the change in the characteristics of the internal and external properties of the object (enterprise), there is a corresponding change in the structure and parameters of the control regulator in order to ensure the stability of the operation of the enterprise.

The domestic construction business is mainly project-oriented, based on the fulfillment of four main goals presented in such areas as budget, time, quality and safety component. Even if these goals are met, a more customer-oriented lean model can outperform standard goals, add value to the customer, and improve the overall process.

Lean production (Leanproduction, Leanmanufacturing) is an approach to organization management aimed at improving the quality of work by reducing losses. This approach extends to all aspects of activity from design and production to product sales. Lean production involves the involvement of every employee in the process of business optimization and maximum focus on the consumer.

Resources in lean are mainly based on the elimination of the loss component, which is considered as a loss of time for processing, transportation, storage, adjustment and, most importantly, it is human resources, building materials and equipment. Differences in traditional and lean management can be summarized in table 3.4.

Table 3.4.

The difference between a traditional business model and a lean business model - an approach to the management and implementation of the process in construction

Approach to management		Construction process	
Traditional models	Lean model	Traditional models	Lean model
A step-by-step and individual approach	Participatory approach	A project creates a process	A continuous attempt to standardize the process
Project - delivery	Customer needs Delivery /Meeting	Linear process	Simultaneous (multilevel)
Individual risk management	Total risk and reward	Sales based on intermittent flow	Continuous flow
Lean tool	Lean culture and way of doing business	Separate logistics	General integrated logistics

Source[73]

The main principles of the Lean system can be formulated as follows:

1. Determine what creates the value of the product from the point of view of the end consumer;

2. Determine all necessary actions in the production chain and eliminate losses;

3. Reorganize actions in the production chain in such a way that they represent a flow of work;

4. Do only what is necessary for the end user;

5. To strive for perfection due to the constant reduction of unnecessary actions.

The study offers a schematic representation of the alignment of flows between the existing problems of the construction enterprise "KBD" LLC and Leanconstruction proposals (Fig. 3.8.)

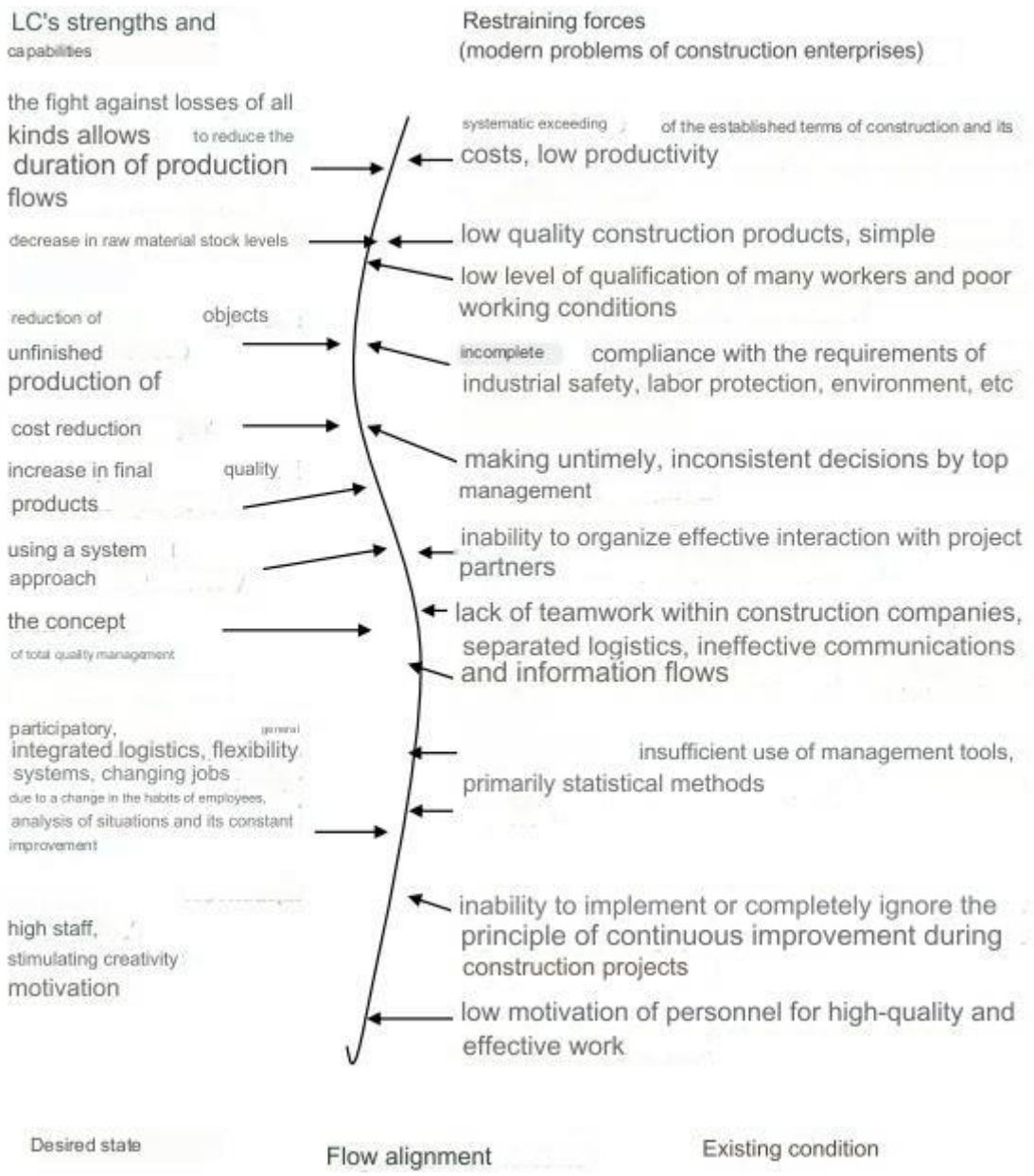


Fig. 3.8. Alignment of flows between the existing problems of the construction enterprise "KBD" LLC and the opportunities of Lean-construction

Source[generated by the author]

The management of KBD LLC should expand the use of lean production principles. This applies to all stages of the construction cycle, as it allows you to make the necessary improvements at each site of work, involving almost all employees, from workers on the site to construction managers, to participate in the change process.

Imperfect methods of planning construction materials during construction create an excess of waste on the construction site [58]. To avoid this, effectively organized logistics of waste avoidance in construction production will allow to reduce costs of waste management, increase income from primary and secondary residual materials.

Currently, there are no legal requirements for mandatory waste treatment; Ambiguous terms of disposal, placement, disposal of waste are determined; sanctions for violating the rules of separate collection of industrial waste (including construction); unregulated process of control and regulation of waste flow management.

Logistics involves differentiation of waste, its secondary use, destruction, problems of transportation, storage, development of resource-saving and low-waste technologies.

Despite the forced nature of the implementation of such actions at the enterprise, they are effective and economical. The implementation of resource-saving technologies in waste management systems requires an assessment of their effectiveness at each phase of the investment project's life cycle. The solution of this problem is possible based on the results of modeling the management of indicators of the dynamic environment of the project.

The hierarchy of waste management - a universal model for handling any type of waste - is a classification of actions with them according to the degree of their priority and is built on the following principles:

- prevention or reduction of waste generation;

-distribution of waste near the source of its formation; return to production by secondary use of waste process:

-recycling - waste processing to obtain new types of raw materials or products from them:

- disposal of waste to reduce its danger to the natural environment:

- landfilling of waste is the worst alternative of waste management [59.]

It is advisable to justify the economic feasibility of one of the alternative innovative waste disposal projects in the logistics system at each phase of the project life cycle in accordance with the proposed structural and logical model of construction waste management (Fig. 3.9).

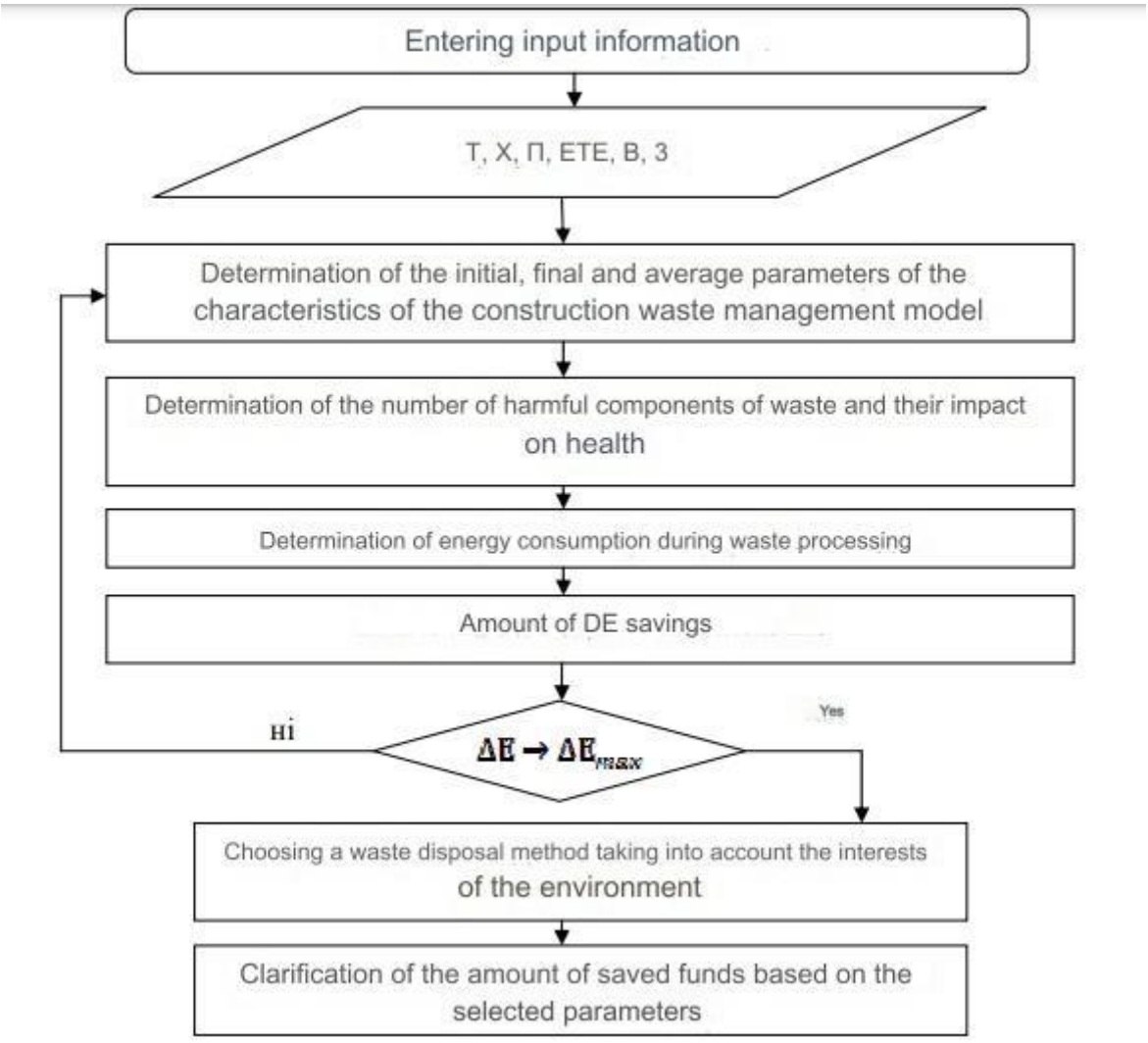


Fig. 3.9. Structural and logical model of construction waste management during cost regulation in the logistics system

Source[generated by the author]

According to the results of numerical modeling, by varying the parameters of the dynamic environment of the construction waste management innovation-investment project, the factors affecting the environment are specified and the optimal resource-saving option is selected.

3.2. Development of measures based on basic approaches to management with elements of risk management to increase the efficiency of construction project implementation

Construction, which used to be one of the flourishing branches of business in Ukraine, is currently going through a difficult period related to both internal problems of the industry and instability in the banking sector and the real estate market. The risks are most felt in construction.

Risk is the potential possibility of a controlled event occurring in conditions of uncertainty in the environment of economic activity, which is subject to quantitative and qualitative assessment.

In order to make and implement management decisions aimed at reducing the probability of an adverse outcome and minimizing possible losses caused by risk implementation, the simplest solution is considered to be the introduction of a risk manager position in the organization and the creation of a body that coordinates actions to manage the main types of risk [74].

The process approach defines risk management as a series of consistent, continuous, interconnected actions aimed at achieving the goals of the innovative project.

The systematic approach to risk management of innovative projects allows traditionally to distinguish two subsystems: the subject and the object of management. The object of management in the risk management of innovative projects is the level of risk, as well as the resources necessary for the development and implementation of the project, information flows and economic relations that arise within the team of project developers, between the project developers and the company's divisions; between them and policyholders, investors and other project partners.

The subject of management in the risk management of innovative projects is a special group of people, which includes line and functional managers of the project, which include: the project leader, risk manager, financial manager, etc. Based on the received information, the management entity, using various methods, functions and tools, develops and implements measures to prevent, reduce or keep the risk of innovative projects within acceptable limits.

The situational approach to risk management of innovative projects assumes that risk management is a reaction to various situations of the project's action, occurring outside and within it. A situation is a set of circumstances influencing the emergence of a risk. Therefore, risk managers must constantly determine the current situation and make decisions depending on it.

In the history of the development of risk management, four main stages can be distinguished (table 3.4.).

Table 3.4.

The main stages of risk management development

Periods	Stages and their features	Important events
1970s	Micro risk management: risk management takes place at the level of individuals (brokers, financial department specialists)	1973, the abolition of the Bretton Woods system of fixed exchange rates and the publication by Black and Scholes of the formula for estimating the value of options, which gave a stimulus-response to the quantitative measurement and management of currency risks
1980s	1. Management of assets and liabilities at the treasury level; 2. Strategic management assets and liabilities through planning and control	In the late 1980s, the creation of the concept of "value-at-risk" (VAR, Value-at-Risk) expressed in monetary units, an estimate of the value that the losses expected during a given period of time with a given probability will not exceed
1990s	1. Market risk management through risk control within the financial department, emergence of the "risk management" function 2. Credit risk management through risk control within the financial department, development of the "risk management" function 3. Operational risk management by conducting an internal audit, using the "risk management" function	In 1996, the International Association of Risk Management Specialists began operations in New York and London. In 1997, Risk Metrics Group (a subsidiary of J.p. Morgan) published a method for calculating the Credit VAR indicator (similar to the VAR indicator in the credit sector)
The beginning of the XXI century.	Corporate risk management is based on a comprehensive approach to risk management, capital and operational management i of assets and liabilities	2002 – enactment of the Sarbanes-Oxley Act to protect investors by increasing the accuracy and reliability of corporate information disclosed under securities laws and for other purposes. Creation of the International Professional of Risk Managers (PRMIA)

Source[74]

The implementation of the risk management process is not so much the development of measures to counter risk factors, but a change in the management paradigm of the enterprise, which is expressed in how it: – organizes its management system (this allows a new look at the company and how it copes with internal and external problems); - distributes responsibility for achieving its strategic goals at all levels of the enterprise; - relies on risk management as the basis of

competitive advantage, i.e. how risks are analyzed and managed at the enterprise [75].

The main structural elements of the risk management process are presented in the table. 3.6.

Table 3.6.

The main structural elements of the risk management process at the enterprise

Stage	Characteristic
1. Definition of the concept of risk management	It is necessary to determine the external characteristics of the business environment, the internal parameters of the enterprise, as well as the risk management parameters in which the process will be implemented. Requirements for the activity should be defined, based on which risk criteria will be identified, as well as the structure and methods of their analysis
2. Development and adoption of a risk management scheme	Risky business operations are defined. They are ranked according to the level of probable risk. Functional elements that are components of the risk management process are defined
3. Participation of top management in risk management	Senior management creates risk management bodies, establishes relationships between management units, develops strategic regulations regarding the risk of the main business processes
4. Establishment of those responsible for the implementation and organization of risk management at the enterprise	Responsible specialists carry out identification, analysis and diagnosis of the main factors that affect the formation of risks. Coordination in risk management of all links of the risk management system, management apparatus and specialists. Develop and implement measures to stimulate financial managers and other specialists to be interested in the results of their work, aimed at reducing risk based on defined rules and procedures
5. Identification of risks	It is necessary to determine where, when, why and how risk situations can interfere, weaken, restrain or contribute to the achievement of planned results (goals)
6. Risk analysis	It is necessary to determine the consequences, probability of occurrence and, therefore, the level of risk, as well as the causes and factors of risk situations. At the same time, it is necessary to take into account the scale of potential consequences and possible directions of their occurrence, as well as to identify and evaluate the available tools (models and methods) of risk control
7. Risk assessment	The risk level is compared with the previously established criteria. According to the received data and parameters of the risk management model, the balance between potential benefits and negative consequences is determined, which makes it possible to make decisions about the scale and nature of risks, management influence on them, as well as to establish priorities areas of activity related to risk management
8. Acceptance and implementation of a risky decision	Development and implementation of specialized economically expedient strategies and action plans aimed at reducing costs arising from risky situations and increasing benefits
19. Monitoring of the risk management process	It is necessary to monitor the indicators of the risk management process, which serves as the basis for the analysis and improvement of the effectiveness of this process at all stages of risk management for continuous improvement of activities

Source[74]

In modern Ukrainian housing construction, some of the projects are complex and confusing. The introduction of new construction financing mechanisms, unfortunately, did not simplify it. Financial and credit mechanisms have become a kind of chain connecting the end consumer of housing as a supplier of funds for

construction with builders. At the same time, all three parties have their own interests in risk management and the authority to deal with this issue (Fig. 3.10.)

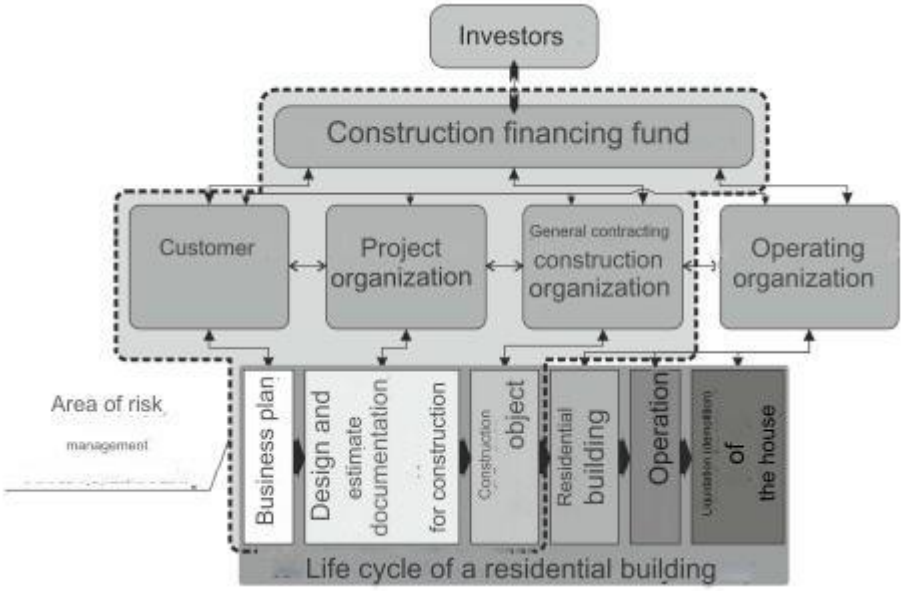


Fig. 3.10. Diagram of the interaction of the participants of the PushaHouse residential complex construction project with financing through FFB

Source[generated by the author]

The occurrence of risks in construction is random in nature, which can affect the occurrence of undesirable consequences for the participants. It can be concluded that the occurrence of risks is an objective element of the investment process, and therefore minimizing the scale of their impact on the financial condition of construction participants is an important direction of the company's activity. The occurrence of a risky situation is always associated with a certain type of loss, therefore, participants in the investment process need to identify the probability of their occurrence at the initial stages of projects, analyze directions for reducing the negative consequences of the occurrence of risk or ways to avoid it.

All aspects of risk management are subject to mandatory registration. All information is stored on the basis of standard forms of documents. A risk database is

created, which is the basis for developing further actions. The goals and objectives of the risk management functions of the implementation of investment construction projects are presented in the table. 3.7.

Table 3.7.

Goals and tasks of the risk management functions of the implementation of investment construction projects of LLC "KBD"

Functions	goals	Task
Planning	Designate the order, sequence and terms of implementation of risk management measures	1. Develop a risk management plan. 2. Determine the need for staff training.
Identification of risks	Get a description of the risks of implementing an investment construction project	1. Identify 5-15 real situations that may in the future have a negative impact on the process of implementing an investment construction project. 2. Document the characteristics of these situations with a bang hiding why they are seen as risks.
Risk assessment	Estimate probable losses in the process of implementing an investment construction project	1. To determine the probability of occurrence of risks. 2. To determine the amount of losses in the event of the manifestation of risks. 3. Calculate the degree of impact of risks on the process of implementation of an investment construction project. 4. Set the level of each identified risk.
Risk management	Reduce the degree of exposure to risks to an acceptable level.	1. Develop detailed measures as part of the risk management strategy: determine completion dates; share responsibility; allocate the necessary resources. 2. Implement risk management measures.
CONTROL	Support established procedures for handling risks.	1. Determine the effectiveness of risk management. 2. Adjust risk management measures in case of their ineffectiveness.
Documentation	Save the main decisions and results of actions taken in the process of risk management	1. Fill out a special form for each identified risk. 2. Save all risk information in the risk database. 3. Form a risk rating.

Source[generated by the author]

As world experience shows, foreign economists, in particular American economists, distinguish two main types of risks in housing construction. The first of them is the so-called unavoidable risks. In this situation, construction companies conclude property insurance agreements with insurance companies. The second type of risks is associated with the inevitable uncertainty of the process of conducting housing and construction business (Fig. 3.11) [76, p. 234].

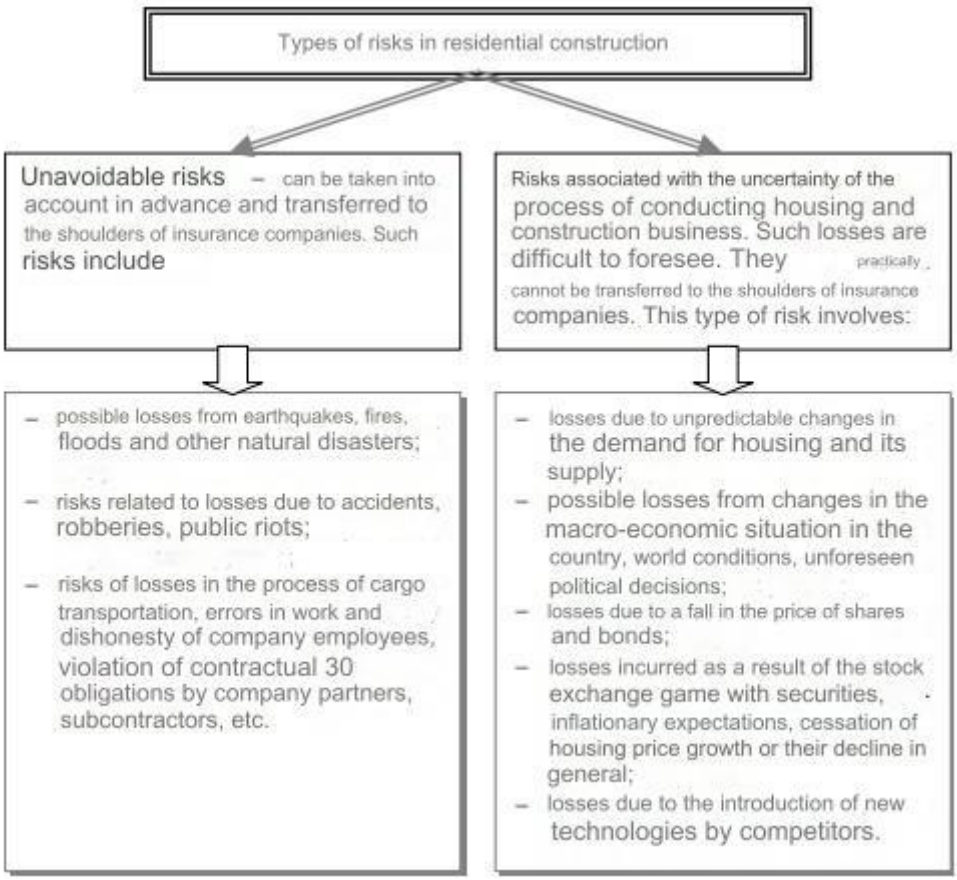


Fig. 3.11. Types of risks in residential construction

Source [author's scheme based on a review of literature and scientific works [76]]

Identification of a greater number of design risks of construction enterprises makes it possible to further develop a more detailed risk management plan with the aim of integrating this plan at enterprises of the same industry. This will reduce the impact of project risks and ensure the sustainable development of enterprises in the construction industry, meeting the needs of modern society.

The interrelationship of risks in the process of implementation of an investment construction project is shown in fig. 3.12.

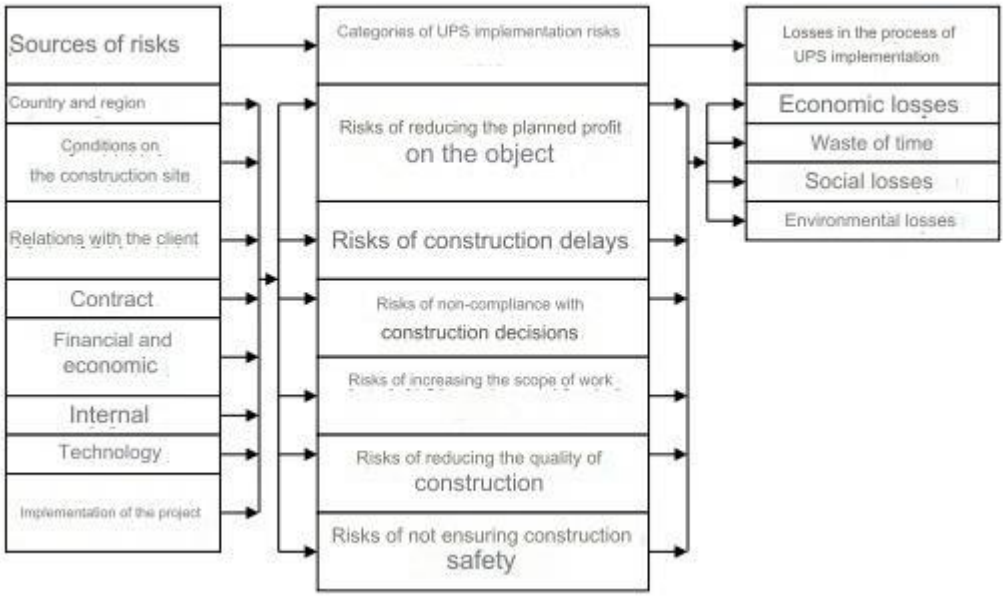


Fig. 3.12. Interrelationship of risks in the process of implementation of the investment construction project of PushaHouse residential complex

Source[generated by the author]

Given the specifics of the project organization, risks in construction activities arise at each stage of the project's life cycle (Table 3.9.), which is determined by the variety of construction works and the complexity of relations between the participants in the process. Table 3.9.

Project risks by phases of the life cycle

Types of risk	The main causes and consequences of risk
1. Pre-investment phase	
1.1. Errors in the assessment of alternative technologies and the selection of technology and equipment for a given project	1.1.1. Unstable work 1.1.2. Failure to meet quality requirements due to technological factors
1.2. Overestimation of the level of demand for products in terms of volume, assortment and quality	1.2.1. Non-utilization of the enterprise's design capacity to the end 1.2.2 Release of products that do not meet consumer requirements
1.3. Unsuccessful placement of the project (construction object)	1.3.1. Remote distance from the main sales areas 1.3.2. High level of transport costs
II. Investment phase	
2.1. Risk of incomplete funding or delay in funding	2.1.1. Increase in interest rates on loans 2.1.2. Unstable financial condition of investors 2.1.3. Financial crisis in the customer's country
2.2. The duration of the project creation process is too long	2.2.1. Unstable work 2.2..2. Changes in legislation
2.3. The need for greater investment	2.3.1. Uncertainty of demand for the project 2.3.2. Changes in project works

Continuation of table 3.9.

2.4. The risk of an increase in the contractual terms of construction and disruption of the commissioning date	2.4.1. Errors in drawing up the construction schedule 2.4.2. Unsatisfactory management and construction organization 2.4.3. Disruption by contractors of contractual obligations in terms of the terms and quality of deliveries, in terms of the term and quality of construction and installation works 2.4.4. Delay in the production and delivery of construction materials, structures and equipment 2.4.5. An error in the configuration of the equipment
2.5. Exceeding the estimated cost of construction	2.5.1. Increase in prices for construction materials, equipment, transport tariffs, etc. 2.5.2. Errors in calculations of structures, equipment and technologies 2.5.3. Change of duties and fees 2.5.4. Change in tax rates
III. Operational phase	
3.1. The risk of not developing the design capacity	3.1.1. Deterioration of the quality of raw materials 3.1.2. Hidden equipment defects 3.1.3. Non-compliance with strict technology requirements 3.1.4. Unsatisfactory operational management
3.2. The risk of increasing production costs compared to design costs	3.2.1. Increase in prices for raw materials, energy carriers 3.2.2. Deterioration of the actual quality characteristics of raw materials and materials in comparison with design ones
3.3. Non-receipt of funds for the implemented project	3.3.1. Decrease in the financial stability of entrepreneurship 3.3.2. Loss of trust from customers

Source[74]

Effective organization of risk management makes it possible to predict the occurrence of a risk event with a high probability and to take the necessary measures to reduce the level of risk. A scientifically based division of risks by individual characteristics to achieve the set investment goals makes it possible to clearly determine the place of each risk in their overall system

From the point of view of the timeliness of decision-making regarding the prevention and minimization of losses, three approaches to risk management can be distinguished (Table 3.10.).

Identified risks, causes and consequences of risks (table 3.9.) must be registered, accordingly, for each risk, measures to respond to them are proposed. The PMBoK standard suggests the use of basic strategies for responding to project risks (Table 3.11).

Table 3.10.

Approaches to risk management and their content

Approach to risk management	Content of the approach
Active approach	Means the manager's maximum use of risk management tools to minimize their consequences. With this approach, all business operations are carried out after taking measures to prevent possible financial losses
Adaptive approach	It is based on taking into account existing business conditions in the management process, namely risk management is carried out in the course of business operations. At the same time, it is impossible to prevent all losses in the event of a risky event, and only part of the losses can be avoided
Conservative approach	Assumes that the management influence on financial risks begins after the occurrence of a risk event, when the enterprise has already received a loss. In this case, the goal of management is to localize the loss within the framework of any one financial operation or one unit

Source[74]

Table 3.11.

Basic strategies for responding to project risks

Response strategies to negative risks (threats)		Response strategies to positive risks (favorable opportunities)	
Avoidance	the project team acts to eliminate the threat or protect the project from its impact	Using	the strategy is used to respond to risks with a positive impact, if from the point of view of the organization it is necessary that this favorable opportunity is guaranteed to be realized
Transfer	the project team transfers the consequences of the threat, along with the responsibility for response, to a third party	Magnification	strategy is used to increase the likelihood and/or positive impact of the right opportunity
Decrease	the project team acts with purpose decreasing probability occurrence or exposure to risk. It involves a decrease likelihood and/or impact adverse risk to acceptable limit levels	Divide	positive risk sharing implies the transfer of part or all of the responsibility for a favorable opportunity to a third party who is better able than others to take advantage of this favorable opportunity in interests of the project
Acceptance to recognize the risk and not to do any-	the project team decides what actions to take before the risk occurs	Adoption	the desire to take advantage of the favorable opportunity in case of her onset without actively pursuing it.

Source[75]

It should be noted that a clear prediction of the risks associated with housing construction and an understanding of the sources of their occurrence are necessary

prerequisites for making decisions and implementing effective measures to minimize them.

The risk management mechanism of construction projects on the basis of TIF is a set of methods, forms, tools and levers of financial support of the construction project implementation process, taking into account possible implementation risks, as well as state (municipal) regulation of these processes (Fig. 3.13).

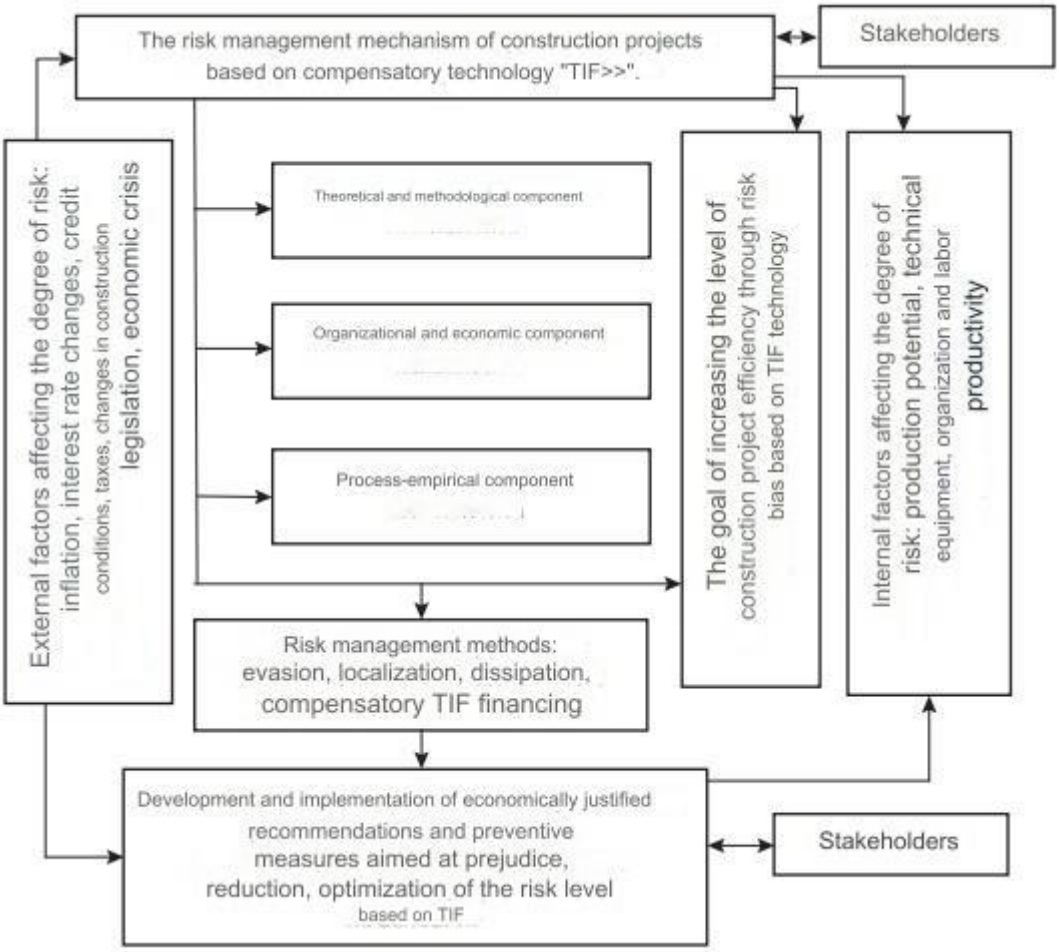


Fig. 3.13. Mechanism of risk management of construction projects of "KBD" LLC based on compensatory technology TaxIncrementFinancing (TIF)

Source[generated by the author]

It is appropriate to highlight the following main methods of minimizing risks in construction:

- risk insurance;

- rejection of untrustworthy partners;

- avoiding implementation of the most risky construction projects.

In order to diversify risks in construction, it is necessary to clearly distribute responsibility among construction participants; use opportunities to enter various construction markets; form a portfolio of projects in such a way as to avoid investing funds in very large projects, giving preference to numerous smaller projects that require relatively smaller investment resources.

CONCLUSIONS

1. It is substantiated that the modern management model should represent a holistic integrated approach to management.

2. It was determined that one of the important tasks of management as a professional activity is the prediction of changes in the external environment and the construction of a management system focused on taking into account future trends and reducing the level of their uncertainty. Management has evolved from a system of reactive adaptation to a system of management based on anticipated changes and impact on them.

3. Digitization is substantiated as a management component and a component of the resource and image potential of a construction enterprise, which provides the enterprise with overcoming threats to the functioning and development of the enterprise in conditions of external and internal threats, taking into account a certain stage of the life cycle and the features of general and special management functions performed at these stages.

4. Despite the large number of studies on the problems of conducting business in a single dynamic field of functioning and development on the basis of processes of business activation, intellectualization, informatization, in the context of the implementation of economic relations, insufficient attention is paid to the institutional base, infrastructural support, trends and innovative tools for the introduction of modern management technologies transformation of operating systems of construction enterprises in the conditions of digitalization of the economy.

5. The construction industry of Ukraine and its dynamics are analyzed. An assessment of the company's financial condition was carried out. In 2020, the company made a loss. The construction project of the PushaHouse apartment

building of KBD LLC was characterized, and management elements at each stage of the project were analyzed.

6. The impact of digitization on the company's activities is considered. BIM is the core of the digital transformation of updating the functional and production subsystem of KBD LLC. The organizational and economic mechanism of ecological and economic management of KBD LLC is proposed to improve the efficiency of activities and meet the criteria of sustainable development.

7. It has been studied that the implementation of the concept of marketing 4.0 in the activities of a construction enterprise, the development of a matrix of values ensures the sustainable development of the enterprise in the long term, has an impact on the formation of the needs of customers, own employees, investors and ensures an increase in the level of competitiveness of the enterprise.

8. The proposed structural-logical model of construction waste management during cost regulation in the logistics system will allow to manage the variable parameters of the dynamic environment of the innovative investment project of environmental management of construction waste.

In conclusion, it should be noted that the need for changes in the organization arises sooner or later, regardless of which development ideology it adheres to and which management paradigm determines the dominant of its functioning. However, the effectiveness of its functioning depends on how these changes will be implemented in the organization.

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Appendices