Анализ динамики развития методов управления проектами как источника формирования методологических основ проектного подхода к управлению

Analysis of the dynamics of development of project management methods as a source of formation of methodological foundations of the project approach to management

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Аннотация
Обеспечение стабильных и значимых темпов роста национальной экономики в современных условиях предполагает реализацию государственных проектов и программ, в том числе по направлению «Экономическое развитие и инновационная экономика». Развитие экономики за счет широкого использования инновационных решений, позволит оперативно обеспечить непрерывное обновление технической и технологической базы производства, освоение и выпуск новой конкурентоспособной продукции, будет способствовать диверсификации национальной экономики, наращиванию экспортного потенциала, а также обеспечит развитие системы социальной защиты населения и даст гарантии национальной безопасности. Реализация стратегических целей национальной экономики на современном этапе требует оптимизации системы управления в целом, и более широкого использования инструментов и методов программного и проектного управления на различных уровнях хозяйствования, в частности. Развитию методов управления проектами посвящено достаточно большое количество научных работ. Однако в большинстве этих работ этапы развития методов управления проектами на основе мирового опыт ограничивается периодом 1940 – 1990-х годов. А тем временем технологии управления проектами идут вперед. Они получили свое развитие и в 2000-е годы, и в 2010-е годы, и в 2020-е годы. Кроме того, сегодня уже становятся понятны тенденции их развития в 2030-е годы. В этой связи представляет интерес на основе анализа мирового опыта рассмотреть процессы эволюции методов управления проектами на более широком временном интервале с 1910-х по 2020-е годы с прогнозом на 2030-е годы. Целью представленных исследований является анализ динамики развития методов управления проектами как источника формирования методологических основ проектного подхода к управлению в ретроспективном, текущем и прогнозном аспектах. Научная новизна представленных результатов заключается в анализе процессов развития методов управления проектами с учетом динамики больших циклов экономической активности Н.Д. Кондратьева, приведенных с периодизацией по малым циклам экономической активности К. Жугляра (учитывающих динамику спроса, инвестиционных решений и производственных возможностей (объема производственных

мощностей) и инерционность перечисленных процессов), определяющих закономерности развития концепций управления, что позволяет осознать процессы эволюции методов управления проектами как источника формирования методологических основ проектного подхода к управлению в период с 1910-х по 2030-е годы и на дальнейшую перспективу. Практическая значимость полученных результатов заключается в возможности их использования для дальнейшего развития методов управления проектами как источника формирования методологических основ проектного подхода к управлению.
Ключевые слова: анализ динамики, развитие, методы управления проектами, формирования методологических основ, проектный подход к управлению.

Abstract

Ensuring stable and significant growth rates of the national economy in modern conditions involves the implementation of government projects and programs, including in the direction of "Economic Development and Innovative Economy". The development of the economy through the widespread use of innovative solutions will quickly ensure continuous updating of the technical and technological base of production, the development and release of new competitive products, will contribute to the diversification of the national economy, increasing the export potential, and will also ensure the development of the social protection system of the population and provide guarantees of national security. The implementation of the strategic goals of the national economy at the present stage requires the optimization of the management system as a whole, and a wider use of tools and methods of program and project management at various levels of management, in particular. A fairly large number of scientific papers are devoted to the development of project management methods. However, in most of these works, the stages of development of project management methods based on world experience are limited to the period of the 1940s - 1990s. Meanwhile, project management technologies are moving forward. They were developed in the 2000s, and in the 2010s, and in the 2020s. In addition, today the trends of their development in the 2030s are already becoming clear. In this regard, it is of interest to consider the processes of evolution of project management methods over a wider time interval from the 1910s to the 2020s with a forecast for the 2030s based on the analysis of world experience. The purpose of the presented studies is to analyze the dynamics of the development of project management methods as a source of formation of the methodological foundations of the project approach to management in retrospective, current and forecast aspects. The scientific novelty of the presented results lies in the analysis of the processes of development of project management methods taking into account the dynamics of large cycles of economic activity N.D. Kondratiev, presented with periodization by small cycles of economic activity of K. Zhuglyar (taking into account the dynamics of demand, investment decisions and production capabilities (volume of production capacity) and the inertia of the listed processes), determining the patterns of development of management concepts, which allows us to understand the processes of evolution of project management methods as a source of formation of methodological foundations of the project approach to management in the period from the 1910s to the 2030s and for the future. The practical significance of the obtained results lies in the possibility of their use for further development of project management methods as a source of formation of methodological foundations of the project approach to management.
Keywords: analysis of dynamics, development, project management methods, formation of methodological foundations, project approach to management.

Introduction

Ensuring stable and significant growth rates of the national economy in modern conditions involves the implementation of state projects and programs, including in the direction of "Economic Development and Innovative Economy". Development of the economy through the widespread use of innovative solutions will allow for the prompt continuous updating of the technical and technological base of production, the development and release of new competitive products, will contribute to the diversification of the national economy, the growth of export potential, and will

also ensure the development of the social protection system and provide guarantees of national security.

The implementation of the strategic goals of the national economy at the present stage requires the optimization of the management system as a whole, and a wider use of tools and methods of program and project management (Project Management) at various levels of management, in particular.

Project activities are complex, unique actions, formalized in advance, technologically developed taking into account the specifics of a particular situation, having certain limitations on a number of indicators (composition and volume of work, available resources, time, cost, quality, etc.) [29].

In turn, project management or project management is a special type of management activity aimed at achieving certain results under specified parameters. Project management, in contrast to, for example, functional activities, is often carried out on the basis of a one-time, rather than cyclical activity. Project management methods and tools allow you to more clearly define the goals, main stages, necessary resources, project deadlines, form a professional team of performers, prepare and conclude effective contracts, identify possible risks, ensure control over the progress of the project throughout its life cycle and promptly make the necessary adjustments. All this allows you to significantly increase the efficiency of the processes being implemented within projects and programs.

With the help of program and project activities, you can effectively solve a wide range of issues related to production, educational, research, environmental or other issues [29].

A fairly large number of scientific papers are devoted to the development of project management methods.

However, in most of these works, the stages of development of project management methods based on world experience are limited to the period of the 1940s - 1990s.

So, it is generally accepted that the emergence of project management is associated with the first developments in matrix organization for the management and implementation of complex projects, the author of which is L. Gulik [6], date back to the period of the 1930-1950s. Although in fact project management originated much earlier.

For example, in Russian history, many associate successes in project management with the reforms of Pyotr Arkadyevich Stolypin at the very beginning of the 20th century. Others attribute the beginning of the science of project management to the even earlier works of Mikhail Mikhailovich Speransky at the beginning of the 19th century, etc.

In addition, the description of the processes of development of project management methods in well-known sources, as a rule, ends in the 1990s.

Meanwhile, project management technologies are moving forward. They were developed in the 2000s, and in the 2010s, and in the 2020s. In addition, today the trends of their development in the 2030s are already becoming clear [29].

In this regard, it is of interest to consider the processes of evolution of project management methods over a wider time interval from the 1910s to the 2020s with a forecast for the 2030s based on an analysis of world experience.

Materials and methods

The research materials in the work included modern scientific works devoted to the development of project management methods [1-3,5,7,10-14,33-35], etc.

The following research methods were used in the work:

- theoretical research methods, including: abstraction, analysis, analogy, deduction, induction, classification, specification, generalization, formalization;
- practical research methods, including: observation, comparison, description;
- specialized economic and related methods, including: historical methodology, evolutionism, cyclical and wave models of economic dynamics, structuralism, etc.

Results and discussion

When studying the processes of development of project management methods, their periodization was carried out within the framework of small cycles of economic activity of K. Zhuglyar lasting approximately 10 years, taking into account the dynamics of demand, investment decisions and production capabilities (volume of production capacity) taking into account the inertia of processes [8].

Research conducted on the basis of studying world experience, devoted to the consideration of the main stages of the development of project management as an independent area of activity, made it possible to identify the following of them [29].

The beginning of the development of modern project management methods is often associated with the development of a calendar schedule for the execution of project work in the form of a strip chart by Henry Gantt [23]. It is believed that the first version of this type of strip chart was developed by G. Gantt in 1910. The main characteristics of G. Gantt's chart are as follows:

– the horizontal axis of the strip chart is the time of execution of tasks for the project and the project as a whole;

– the vertical axis of the strip chart shows the list of tasks for the project;

– each strip (ribbon) of the chart characterizes the planned duration of the task (work) for the project, indicating the start time and end time of their execution;

– the establishment of marks, called milestones, indicating significant moments in the progress of work on the project, the common boundary of two or more related tasks, reflecting the synchronization of the sequence of execution of various works, in which the shift of a milestone in time leads to a shift in all subsequent work on the project.

It should be noted that the development of the Gantt chart coincided with the period of economic decline according to the large cycles of N.D. Kondratiev [24], which is characterized by a functional approach associated with the search for compensation mechanisms for the routinization of innovative solutions. One of these mechanisms was the Gantt chart.

Of course, the Gantt chart does not provide an idea of the nature of the work performed and its significance for the project. In addition, the Gantt chart does not characterize the resource intensity of certain project tasks.

Nevertheless, due to its simplicity and clarity, the Gantt chart is an important tool in the project management system in the 21st century [29]. The same period (1910s) should include the beginning of Adamsky's work on the theory of harmonography (1916 - 1931), as well as White's work on the construction of linear graphs with the precedence of work (1918). It is believed that these developments were the prototypes of network planning methods (CPM and PERT) [29].

In the 1920s, project management developed largely on the basis of the works of A.K. Gastev on issues of scientific organization of labor (SOL) [19]. Russian scientist Aleksey Kapitonovich Gastev, unlike his American contemporaries F.W. Taylor and G. Ford, who focused on improving production technology, paid special attention to the human factor and issues of organizing human labor [29].

A.K. Gastev believed that a person, as the main productive force, plays a primary role in ensuring the efficiency of an organization. And the efficiency of an organization is based on the personal efficiency of each employee at his or her workplace [19].

The emphasis on finding technologies to improve the efficiency of each employee at the workplace was due to the period of the global crisis in the cycle of economic activity of N.D. Kondratyev, which occurred in the 1920s [24], which is characterized by a situational approach associated with the definition and systematization of the most cost-effective options for implementing innovative processes. A.K. Gastev, in fact, developed such an economically feasible version of rationalization on a systemic basis [29].

As one of the key components of the efficiency of each employee, A.K. Gastev considers the efficiency of using working time, which became the prototype of modern time management [29].

It is believed that it was the theory of NOT Gastev A.K. that formed the basis of the concept of "lean production" (Lean Production), developed by Taiichi Ohno and Shigeo Shingo within

the framework of the Toyota production system in the 1950s, and aimed at "managing a manufacturing enterprise associated with a constant desire to eliminate all types of losses" [18]. It should be noted that the concept of "lean production" is still being implemented today in the Toyota Motor Corporation, which, according to Forbes magazine, is one of the most successful companies in the automotive industry in the world.

The first developments of Procter & Gamble in project product management also date back to the 1920s [29]. The emergence of project management as an independent discipline in world practice is most often attributed by experts to the 1930s, when special methods for coordinating the engineering of large projects were developed in the United States [29]:

- aviation - in the US Air Corporation;
- oil and gas - in Exxon Mobil;
- etc.

So in 1930, the US Air Corporation US created for the first time a project office responsible for the implementation of the project as a whole.

It should be noted that the 1930s were a period of growth in economic activity according to the large cycles of N.D. Kondratiev [24], which is characterized by a factor approach associated with the search for those factors of economic growth that have the greatest impact on economic development. Such factors, first of all, are the achievements of science and technology, characterizing a new (in this case, the IV-th) technological structure [31].

In 1937, L. Gulick (USA) published the first article on the matrix organization of project management with horizontal links. It was during this period that the foundations of modern project management in the military-industrial complex were laid [29].

In the 1940s, project management was developed on the basis of the theory of operations research, used to find optimal project solutions [29].

It should be noted that the 1940s were a period of growth in economic activity according to the large cycles of N.D. Kondratiev [24], approaching its peak, with a shift due to the influence of the Second World War by the end of the 1940s. The phase of growth in economic activity is characterized by a systems approach associated with the simultaneous consideration of factors of the external competitive and internal organizational environments that affect the innovative processes of implementing new technology [29].

Project management based on the theory of operations research was carried out in the 1940s with the active use of economic and mathematical methods of analysis and modeling. It is natural that the application of these methods during the Second World War was reflected in the solution of problems of control of ground forces (motorized rifle, artillery, armored, etc.), aviation, and the navy [29].

One of the most famous examples of project management based on the theory of operations research in the 1940s is the large-scale research project Manhattan - project, in the implementation of which six hundred thousand people participated, and for the implementation of which $ 2 billion was attracted [4]. It was within the framework of this project with the participation of scientists from the USA and Canada, Germany and Great Britain under the leadership of R.

Oppenheimer and L. Groves that the first atomic bombs were created [25]:

- plutonium Gadget (detonated during the first nuclear test Trinity at the test site in New Mexico on July 16, 1945);
- uranium Little Boy (dropped on Hiroshima on August 6, 1945);
- plutonium Fat Man (dropped on Nagasaki on August 9, 1945).

The main sources of the success of the Manhattan Project are considered to be the high quality of the project organization, including [29]:

- a clear statement of the project goal;
- full support of the project implementation plans by the management;
- a rational matrix structure of work within the project;
- a system for planning the provision of resources to projects using linear graphs.

The 1950s were a period of peak economic activity according to the great cycles of N.D. Kondratieva [24]. This period is characterized by a systemic approach combined with a functional approach. That is, on the one hand, a simultaneous consideration of the factors of the external competitive and internal organizational environment influencing the innovative processes of implementing the technologies of the new order was carried out, and, on the one hand, a search for compensatory mechanisms for the routinization of innovative solutions was carried out [29].

In the 1950s, the development of a "matrix organization for the management and implementation of complex projects" [29] was first applied in project management on a full-scale basis:

- in 1953 - in the Joint Projects Division of the US Air Force;
- in 1954 - in the Special Projects Division of the US Armament;
- in 1955 - in the Special Projects Division of the US Navy.

The first developments for the management and implementation of complex projects in a matrix organization were effective tools for the integration necessary for managing large-scale and complex projects, since they made it possible to unite specialists of the same profile from different departments within the framework of a project at the right time [29].

The next step in the development of project management was the formation of a group for the development of project management technologies by Du Pont de Nemours Co. in 1956. In 1957, the UNIVAC research center and Remington Rand joined these efforts. As a result, at the end of 1957, a team headed by J. Kelly and R. Walker developed the critical path method (CPM) with software implementation on the UNIVAC computer. The CPM technology was successfully tested in the management of the chemical fiber plant construction project in Louisville, Kentucky, USA, and subsequently began to be actively used in drawing up schedules for the creation, development (modernization) of large objects [29].

As a result of this work, the first publications on project management appeared.

The development of the critical path method (CPM) had a great influence on the development of project management as a science and management practice.

The critical path is the most complete path of work that lies on this path in the network schedule. It is the duration of the critical path that determines the shortest total duration of work in the project as a whole. The completion time of the entire project can be reduced by reducing the time it takes to complete tasks lying on the critical path. Accordingly, any delay in completing the critical path tasks leads to an increase in the project completion time. This concept ensures that the manager concentrates his attention on critical work. However, the main advantage of the critical path method is managing the deadlines for completing tasks that are not on the critical path. The CPM method allows you to calculate possible calendar schedules for completing a set of works based on the described logical structure of the network and estimates of the time it takes to complete each job within the project [29].

The CPM method is based on a graphical representation of tasks (jobs) and types of actions performed within the project and on setting the estimated time for completing them in the form of a graph. The jobs are located at the vertices of the graph, and the time it takes to complete each job is demonstrated by the lengths of the graph arcs between the vertices. Today, this approach, called "road maps" (which is actually based on the CPM method), is often used to solve large strategic national economic problems [29].

It is advisable to use the CPM project execution technology in cases where the composition of the jobs and the time it takes to complete them have a certain certainty. The critical path in the graphical interpretation of the CPM indicates the maximum duration of the jobs - from the initial job to the final one.

When implementing a project using the CPM method, tasks are selected and performed simultaneously that do not affect the time of execution of other project tasks or their duration. Thus, the total time of work execution using the critical path method can be reduced due to the parallel execution of unrelated tasks.

The work schedule, called a network diagram in the CPM method, serves to schematically display the project tasks, their interrelations, sequences and execution time. In the CPM graph, the vertices display the tasks, and the lines display the mutual connections between the tasks. The CPM graph is the most common way to represent the project work network [29].

Another milestone in the development of project management was the creation in 1957-1958 by employees of the firm "Boose, Allen & Hamilton" of the PERT (Program Evaluation and Review Technique) network planning system. This system was first implemented in the Polaris program (US Navy), which included 250 contractor firms and more than 9,000 subcontractor firms [17].

The PERT project management method is represented by network diagrams, the vertices of which reflect the events under study, and the lines between the events - the work performed over time.

The differences between the PERT method of network representation of the work graph from the CMP method consist in taking into account the emerging uncertainties in the time of execution of each operation on the project, expressed in the form of three types of estimates: optimistic (O), pessimistic (P) and realistic (R). In this case, the expected time of project execution is calculated by the ratio:

$$T_{\text{exp}} = \frac{T(O) + 4T(P) + T(П)}{6}$$

To improve the efficiency of project management within the PERT method, the following analytical methods and technological techniques are used:

- search for rational steps at the beginning of the project;
- maintaining the pace of work within the projects;
- making decisions aimed at ensuring progress in the implementation of the project;
- critical analysis of the experience of completed projects (assessment of the advantages and disadvantages of the technologies used in them).

In the 1950s, a systems approach to project management by stages of its life cycle was developed, in which special attention is paid to pre-project analysis, it was first implemented within the framework of the "program of the US National Aeronautics and Space Administration - NASA (National Aeronautics and Space Administration)" [16].

The development of a systems approach to project management by stages of its life cycle made it possible to implement the main methodological principles of the systems approach in relation to project management during this period: integrity, hierarchy, structuring, multiplicity, systemicity.

Further development of network planning methods in project management occurred on the basis of the methods and tools of CPM, PERT and a systems approach to project management by stages of its life cycle, formulated in the second half of the 1950s. The generalizing publication of project management methods of this period is considered to be the article by Gaddis in the Harvard Business Review [17]. At the same time, according to experts, these methods have given a powerful impetus to the development of project management throughout the world.

In the 1960s, there was further development of network planning methods in project management, expressed both in the expansion of the scope of application of network methods and in the spread of the practice of applying network project management methods in various countries of the world.

It should be recalled that the 1960s were marked by a decline in economic activity in the world, when, according to the large cycles of N.D. Kondratiev [24], in the conditions of the beginning of stagnation in the economy, a functional approach was implemented, associated with the search for compensatory mechanisms for the routinization of innovative solutions.

During this period, tools were created to improve the efficiency of the matrix form of project management organization, which are associated with the names of J. Galbraith [21], P. Lawrence, J. Lorsch [9] and other researchers. They proposed various types of integration mechanisms and conditions for the appropriate use of the matrix form of organization of project management processes, increasing the efficiency of the latter. The creation of tools to improve the efficiency

of the matrix form of project management organization that took place in the 1960s was marked by the further development of organizational forms of project management. At the same time, a system of full-fledged logistical support for projects was developed.

The development of project management methods in the mid-1960s was marked by the development in 1966 of the Graphical Evaluation and Review Technique (GERT) as an alternative probabilistic method of network planning.

The basis for the application of the GERT method is the use of alternative networks, called GERT networks. GERT networks allow for a more adequate description of complex production processes within a project in cases where it is difficult or, for objective reasons, impossible to clearly determine which work and in what sequence should be performed to achieve the project goal (i.e., to carry out multi-variant planning during project implementation).

The GERT method is usually used in cases of work organization, when subsequent tasks of the project can begin after completion of only a certain number of previous tasks, and not all tasks presented in the network model must be completed to complete the project.

It should be noted that the calculation of GERT networks, modeling real processes within the project, is quite complex and requires special software to calculate the efficiency of the proposed network models.

The 1960s were also marked by the creation of the largest professional project management organizations in Europe - the International Project Management Association (IPMA) and the USA - the Project Management Institute (PMI).

The 1970s were marked by further development of the systems approach to project management. Project management systems increasingly took into account the factors of the external environment of projects that influence the implementation of projects - economic (market), environmental, social, etc.

During this period, the scale of the processes of implementation and use of network planning and project management systems increased. At the same time, the wide recognition of the CPM method led to the fact that it received legislative support, primarily in the USA.

It should be noted that the development of project management methods in the 1970s took place in the context of overcoming the global economic crisis of 1972-1974, when, within the framework of the situational approach, the most cost-effective options for implementing project solutions were systematized.

Important milestones of this period of project management were:

- development of competency schemes and interaction of the project manager and the project team (1971);
- development of methods for managing conflicts between project participants (1977);
- improving the scheme for forming organizational structures for project management (1977-1979).

In the 1970s, the creation of professional project management organizations in various regions of the world also continued [17]:

- in Australia - the Australian Institute of Project Management (AIPM);
- in Asia - the Engineering Advancement Association of Japan (ENAA);
- etc.

The 1980s were marked by the formation of a project management system both as a sphere of professional activity and as an independent interdisciplinary scientific field.

The 1980s were a period when the world economy was emerging from the crisis, accompanied by rapid market saturation and, accordingly, a growing need for project solutions.

It was during this period that the first collective work of the Project Management Institute (PMI) was published in the USA - Project Management Body of Knowledge, PMBoK (Project Management Body of Knowledge), which defined the place, role and structure of project management methods and tools and their contribution to general management issues [15].

The Project Management Body of Knowledge PMBoK [15], which describes five basic project management processes for ten applied knowledge areas, is currently considered the most comprehensive guide to project management.

It should be noted that the relatively low efficiency of project management in the early 1980s was due to the global economy emerging from the crisis and rapid market saturation. This required moving away from the well-known stereotypes of project management and identifying specialized management areas. In this regard, the following specialized project management areas were developed in the 1980s:

- development of project management methods focused on a specific customer (for example, in construction);
- development of configuration and change management methods within a project (for example, in information technology);
- development of project quality management methods (for example, in industrial production);
- development of project team management methods focused on recognizing the high role and importance of partnership, achieving coordinated work of the project team (for example, in social systems);
- development of risk management methods as an independent area in the field of project management (for example, in investment projects).

It is also necessary to pay attention to the fact that with the advent of fourth-generation computers based on large and very large integrated circuits in the 1980s (which made them compact and, accordingly, personal), and new information technologies ensured more efficient use of project management methods and tools." As a result of a set of measures to improve project management methods and the formation of project management as a sphere of professional activity, by the mid-1980s the quality of project management had increased significantly.

The 1990s were marked by the development of innovative processes in the field of project management.

The 1990s were the period of peak economic activity according to the large cycles of N.D. Kondratiev [24], characterized by the flourishing of technologies of the fifth technological order [31].

The specified development of innovative processes in the field of project management is quite clearly described by the model of market dynamics of N. Kano [32], demonstrating how, over time, under the influence of moral obsolescence, consumer properties of products are lost.

This is happening under the influence of growing consumer expectations, and forces manufacturers to constantly look for innovative solutions [32] implemented within the framework of projects.

In 1991, a major work was published in Germany - a textbook and practical guide to project management, prepared by the national Association of Project Management of Germany (GPM), which summarized and systematized many years of theoretical developments and practical experience in project management [17].

The creation and widespread implementation of the Internet in the 1990s had a fundamental influence on the development of project management technologies, which made it possible to begin the development and use of qualitatively new opportunities in project management provided by information technology.

The use of Internet technologies contributed to the high speed of diffusion of project management science in the form of knowledge and experience in many developing countries.

It was during this period (1990) that the Soviet (later Russian) Project Management Association SOVNET was created. The process of innovative development of the project management sphere using new level information technologies led to the awareness of the necessity and possibility, as well as to the practical beginning of the processes of globalization, unification and standardization in the field of project management. In the 1990s, the beginning of the development and

implementation of the certification programs for project managers according to PMI standards was laid.

Evaluation of the capabilities of the potential of project management science demonstrated during this period the prospects for its practical use in previously non-traditional areas: large international social, environmental and other non-commercial projects.

In the 1990s, the possibilities of using project management methods as tools and means of managing political, socio-economic, technical and technological and other reforms were studied in sufficient detail.

In general, the innovative improvement of project management processes in the 1990s led to an increase in the speed and expansion of the boundaries of diffusion of innovative project management technologies.

In the 2000s, the development of project management methods was marked by their focus on the target nature of management.

The fact is that during the downturn in the global economy, which ended with the global crisis of 2008 [30], project management developed under the auspices of the concept of management by objectives (MBO - Management by Objectives), which consists of structuring and deploying goals, followed by designing a system of organization and motivation for achieving these goals within the project. In fact, we are talking about the implementation of the concept of maximum approximation of a project to a specific consumer in the conditions of a saturated market, developed by P. Drucker back in the 1950s [22].

In the 2010s, there has been a fairly rapid development of project management methods based on information technology. There is a significant increase in project management capabilities due to the increase in the volume of information received in a single global information space and from other sources. At the same time, increasing the accuracy and reliability of information ensures an increase in the quality of management decisions made in project management. Today, fairly detailed stereotypical software shells and management schemes for typical projects have been developed on the basis of IT technologies. A typical example of the development of project management based on information technology is the use of blockchain technologies (or block chain) in project management [20].

Blockchain as a continuous sequential chain of blocks built according to certain rules, forming a linked list containing information, ensures due to the fact that copies of "linked lists" are stored and processed in parallel on many different computers:

- a high level of awareness of project participants about ongoing processes and coordination of actions;
- speed of project implementation due to the possibility of parallel work;
- reliability of project implementation due to the use of a distributed data storage system.

It should also be noted that in the conditions of the economic crisis of the 2020s, project management technologies based on information technology provide opportunities for significant savings in material, financial and time resources in project management.

In the 2020s, there is a development of project management methods based on combinatorial technologies [29].

The implementation of project management methods based on combinatorial technologies during this period will be due to the continuing decline in economic activity in the use of technologies of the fifth technological order, the "bottom" of which, in accordance with the cycles of N.D. Kondratieva expectedly came in the 2020s [28]. In anticipation of the growth of economic activity in the 2030-2050s, due to the intensified use of basic technologies of the sixth technological order [31], in the 2020s, combinations of known technologies are predominant [28].

The idea of implementing combinatorial technologies in project management in the 2020s is determined by the "desire to localize possible losses during a decline in economic activity caused by the use of emerging, but still untested project management technologies of the 6th technological order, by strengthening them with repeatedly proven, but beginning to leave the market, project management technologies of the 5th technological order" [27].

In the 2030s, it is expected that the development of project management in the context of the expected growth of economic activity within the framework of the 6th technological order, according to the cycles of N.D. Kondratieva, will be associated with the growth of market competition, inducing an increase in demand for innovations and people capable of generating these innovations. At the same time, the concept of management based on the use of human capital is expected to dominate in management [26].

In relation to project management, this will mean a trend towards an increase in the creative component at each stage of project implementation.

The results of the systematization of the processes of development of project management methods, carried out on the basis of an analysis of international experience, are presented in Table 1.

Table 1

Results of the systematization of the processes of development of project management methods, carried out on the basis of an analysis of international experience

№	Time period	Dominant management concept reflecting patterns of change in economic activity within the cycles of N.D. Kondratiev	Project management methods
1	1910s.	Concept of scientific management	G. Gantt's diagram
2	1920s.	Concept of administrative management	Theory of scientific organization of labor (NOT) of A.K. Gastev
3	1930s.	Concept of management from the standpoint of psychology and human relations	Development by L. Gulik of a model of matrix organization for managing complex projects
4	1940s.	Concept of an empirical approach to management	Development of project management based on the theory of operations research, ensuring the search for optimal project solutions
5	1950s.	Concept of a systems approach to management	Implementation of developments in matrix organization for managing and implementing complex projects. Development of the critical path method (CPM). Development of the PERT network planning system. Development of a system approach to project management by stages of its life cycle
6	1960s.	The concept of a behavioral approach to management	Development of network planning methods. Various types of possible integration mechanisms and conditions for the appropriate use of the matrix form of organizing project management processes were proposed. Graphical Evaluation and Review Technique (GERT) methods were developed.
7	1970s.	The concept of a situational approach to management	Development of a systems approach to project management
8	1980s.	The concept of management culture	Formation of project management as a sphere of professional activity

№	Time period	Dominant management concept reflecting patterns of change in economic activity within the cycles of N.D. Kondratiev	Project management methods
9	1990s.	The concept of an innovative approach to management	Innovative development of the project management sphere
10	2000s.	The concept of management by objectives	Focusing project management methods on the target nature of management
11	2010s.	The concept of management based on information technology	Development of project management methods based on information technology
12	2020s.	The concept of management based on a combinatorial approach	Development of project management methods based on combinatorial technologies
13	2030s.	The concept of management based on the use of human capital	Development of project management methods based on the growth of the creative component at each stage of project implementation

Conclusion

Thus, the presented results of the analysis of the processes of development of project management methods taking into account the dynamics of large cycles of economic activity of N.D. Kondratiev, presented with periodization by small cycles of economic activity of K. Zhuglyar (taking into account the dynamics of demand, investment decisions and production capabilities (volume of production capacity) and the inertia of the listed processes), determining the patterns of development of management concepts allow us to understand the processes of evolution of project management methods as a source of formation of methodological foundations of the project approach to management in the period from the 1910s to the 2030s and in the future.

References

1. Anne C. Fitzpatrick: Igniting the Light Elements // The Los Alamos Thermonuclear Weapon Project. - 2013. - p. 1942-1952.
2. Artamoshkina A.A., Sycheva S.M., Khalimon E.A. Methods and tools of project management used in production organizations. Vestnik Universiteta. 2023;(2):5-12. https://doi.org/10.26425/1816-4277-2023-2-5-12.
3. Aleshin L.V., Anshin V.M., Bagratioi K.A. Project management: a fundamental course. / Textbook, edited by V.M. Anshin, O.N. Ilyina. - M.: Publishing house of the Higher School of Economics, 2013. - 620 p.
4. Clark W. Gantt Charts. Accounting and Work Planning. / 5th edition. - Moscow: Management Engineering, 1931. - 124 p.
5. David Ackah. Project Management Methods, Methodologies, and Frameworks: An Exploration for Study Guild for Project Management Practitioners of Ghana. Project Management Scientific Journal. Volume 1, Issue 5, pp.61-66, May 2019. https://damaacademia.com/pmsj/.
6. Drucker P.F. Management Practice: - Peter Drucker; trans. from English by Ivan Verigin. - Moscow: Mann, Ivanov and Ferber, 2015. - 406 p.
7. Ebenezer Essilfie-Baiden Project Management Scientific Journal Volume 3, Issue 6, pp.84-88, June 2019. https://damaacademia.com/pmsj/.
8. Gulick, Luther Halsey. Education for America Life: Report of the Regent's Inquiry (1936).
9. Gastev A.K. How to work. - M., 1966. - 480 p.
10. Genkin A., Mikheev A. Blockchain. How it works and what awaits us tomorrow. - M.: Alpina Publisher, 2017. - 592 p.
11. Galbraith J.K. New industrial society: [translated from English] / John Galbraith. - Moscow: AST;

St. Petersburg: Transitkniga, 2004. - 602 p.
12. João Varajão, Rui Pedro Marques, António Trigo, Project Management Processes – Impact on the Success of Information Systems Projects, Informatica 33(2022), no. 2, 421-436, https://informatica.vu.lt/journal/INFORMATICA/article/1262/text.
13. Juglar C. Des Crises Commercials Et De Leur Retour Periodique En France. 1862. - 252 p.
14. Kondratyev N.D., Oparin D.I. Large Cycles of the Market: Reports and Their Discussion at the Institute of Economics. - 1st ed. - Moscow, 1928. - 287 p.
15. Leslie Groves. Now We Can Talk About It. - Moscow: Atomizdat, 1964. – 301 p.
16. Lawrence P., and Lorsch J. Organization and Environment. Boston: Graduate School of Business Administration, Division of Research, Harvard University, 1967.
17. Lutz Sommer. Project management approaches and their selection in the digital age: Overview, challenges and decision models. Journal of Project Management 9 (2024) 131–148. https://www.growingscience.com/jpm/Vol9/jpm_2024_1.pdf.
18. Methods project management in the field of tourism and recreation. Victoria Tsypko, Volodymyr Vasylchuk, Maksim Gedin, Sergey Yekimov, Petra Šánová, and Vadym Ratynskiy. E3S Web of Conferences, 070 (2023) IPFA 2023. https://www.e3s-conferences.org/articles/e3sconf/pdf/2023/89/e3sconf_ipfa2023_07014.pdf.
19. Oksana Papelniuk. Development of Methods of Innovative Projects' Management in Developer Organizations. MATEC Web of Conferences 106, 08044 (2017) SPbWOSCE-2016. https://www.matec-conferences.org/articles/matecconf/pdf/2017/20/matecconf_spbw2017_08044.pdf.
20. Prixit Raj, Dr. Parul Sinha. Project Management in Era of Agile and Devops Methodologies. International Journal of Scientific & Technology Research Volume 9, Issue 01, January 2020. https://www.ijstr.org/final-print/jan2020/Project-Management-In-Era-Of-Agile-And-Devops-Methodlogies.pdf.
21. Pulmanis, E. (2019). Project Management Development – Practice and Perspectives: Report on the Eight International Scientific Conference on Project Management in the Baltic Countries, PM World Journal; Vol. VIII, Issue IV (May). https://pmworldlibrary.net/wp-content/uploads/2019/05/pmwj81-May2019-Pulmanis-Latvia-conference-report.pdf.
22. Project Management Development – Practice and Perspectives. International Scientific Conference on Project Management in the Baltic Countries. Riga: University of Latvia, 2021, 68 p. https://www.balticpmconference.eu/sites/default/files/image-uploads/proceeding_book_2021.pdf.
23. Spalek, Seweryn, Traditional vs. Modern Project Management Methods. Theory and Practice (May 19, 2016). Smart and Efficient Economy: Preparation for the Future Innovative Economy, 21st International Scientific Conference, Available at SSRN: https://ssrn.com/abstract=3128584.
24. The Standard for Project Management and A Guide to The Project Management Body of Knowledge. 2023. https://www.pmi.org/standards/pmbok.
25. Tebekin A.V. To The Question of Forming the Concept of Management in the 2030s // Bulletin of the Moscow Financial and Law University MFLA. 2019. No. 2. P. 168-176.
26. Tebekin A.V. Global Trends and National Prospects for the Development of Marketing and Logistics as Applied Areas of Management // Management sciences in the modern world. - 2015. - No. 1. - P. 375-380.
27. Tebekin AV Formation of the Concept of Management of the 2020s / AV Tebekin // Academic Bulletin of the Rostov branch of the Russian Customs Academy. 2018. No. 1 (30). - P. 64-68.
28. Tebekin AV Evolution of Project Management Methods: World Experience and Development prospects. // Russian entrepreneurship. 2017. Vol. 18. No. 24. P. 3969-3994.
29. Tebekin AV The influence of K. Juglar cycles on the development of the international economy in the near future (part 1) / AV Tebekin. - DOI 10.52957/22213260_2023_2_76. - Text: electronic // Theoretical Economics. - 2023 - No. 2. - P.76-88. - URL: http://www.theoreticaleconomy.ru.
30. Tebekin A.V., Seryakov G.N. Ensuring Continuity of Technologies of Various Structures in Industry as A Basis for Effective Economic Development of The Union State. Bulletin

of Polotsk State University. Series D. Economic and legal sciences. 2024. No. 4 (69). P. 62-70.
31. Tebekin A.V. N. Kano's Model of Customer Satisfaction as A Basis for Developing the Concept of An Innovative Approach to Management in the 1990S. Business Strategies. 2019;(7):21-27.
32. Voropaev V.I. Project management in Russia. - Moscow: Alans, 1995. - 225 p.
33. Wisal Morjane, Rachid Bannari, Jihane Gharib. Proceedings of the 5th European International Conference on Industrial Engineering and Operations Management Rome, Italy, July 26-28, 2022. https://ieomsociety.org/proceedings/2022rome/157.pdf.
34. Womack James P., Jones Daniel T. Lean production. How to get rid of losses and achieve prosperity of your company. - M., "Alpina Publisher", 2015. - 292 p.
35. 13th IPMA Research Conference Honoring 60 years of Project Management: Leading the Way into the Future Dubai,UAE April 9–11, 2025. https://www.ipma-research-conference.world/wp-content/uploads/2025/04/13th-IPMA-Resarch-Conference-PM-Reasearch-Ideas-Book-of-Abstracts.pdf.