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Planning paradigms throughout economic history

Abstract. *Planning has always been an essential part of scientific and practical activities, driven by the need for purposeful development in science, technology and society. The paper focuses on the study of the development of planning in the context of the history of economics and economic thought. The purpose of the paper is to study the formation of planning paradigms throughout economic history as a reflection of the features of the socio-economic processes that dominated from the late 19th century to the early 21st century. To achieve this purpose, general scientific (analysis, synthesis, induction and deduction, generalization of literary sources) and special*



(historical-retrospective, chronological, historical-typological, historical-systemic) methods were used. The results of the study showed the main driving force of the genesis is a change in the level of environmental stability, the degree of socio-economic processes predictability and the level of uncertainty in their future development. The historical process of the formation of planning paradigms divided into three periods of dominance: I. The dominance of the neoclassical paradigm (from the late 19th century to the 1970s); II. The dominance of the neo-institutional paradigm (from the late 1970s to the late 1980s); III. The dominance of the evolutionary paradigm (from the late 1980s to the early 21st century). The formation of the neoclassical paradigm was due to the development of capitalism in Europe and was based on the assumption of socio-economic processes dynamics predictability. It allowed the use of optimization planning by continuing established trends into the future. The need to consider the current and future conditions of institutions and their impact on the activities of the economic agents (entrepreneurs, companies, states) led to the formation of a neo-institutional planning paradigm. Recognition of the environmental instability led to the formation of an evolutionary planning paradigm based on considering the trends in the changing world and their dynamics, as well as the ability of economic agents to adequately respond (adapt) to them. One of the main factors in the formation of new planning paradigms was the deepening of the gap between planning theory and practice. As a result, it was impossible to obtain reliable long-term forecasts. One of the features of the genesis of planning paradigms is the parallel use, which allows ensuring their development considering the socio-economic processes that have developed.

Keywords: history of economics; planning; instability; development; socio-economic processes; environment

Introduction.

Planning arose at the dawn of humanity, as soon as people began to understand their place in the surrounding world. The well-known aphorism "to plan or to be planned for" was relevant at all stages of human development. The need to define and describe future trends in various spheres of human activity determined its importance. So, the planning of transport routes, on the one hand, considered the placement of settlements (cities), and, on the other hand, influenced the prospects for their development (Yang, Han, Zhang, Han & Long, 2023; Berisha, Cotella, Janin Rivolin & Solly, 2021). One of the most important aspects of techniques and technology development was to ensure global sustainable development, which also involved the use of strategic planning technologies (Yadav, A., Pal, Patra, & Yadav, M., 2020; Prokhorova et al., 2024). Technological changes required revising the methodological principles of planning various aspects of the socio-economic development, namely the "digitization of the planning culture" and the introduction of artificial intelligence (Nummi, Staffans & Helenius, 2023). The technical development in society and the emergence of new technologies were impossible without investment and innovation planning (Kravchenko & Kychygin, 2023; Trischler & Li-Ying, 2023).

As P. Healey (2020) noted, the development and tradition of planning remained a "curious case". It required constant efforts to identify and study the interaction of dominant social concepts and the needs of social development and its influence on the conceptual foundations of the planning paradigm to ensure its advantages over disadvantages (Rydin, 2021). Therefore, one of the directions of modern research became a rethinking of the theoretical and practical aspects of planning to meet the modern needs of society and ensure an effective transition to the sixth technological order (Avar & Cive, 2024; Glushchenko, 2021).

Although planning was an essential aspect of social, technical, and technological development, it was most often associated with the economy, and its evolution took place in the context of changing economic concepts. Therefore, the study of planning through economic history made it possible to determine the driving forces of the paradigm changes, the main reasons for their changes, and contributed to increasing the effectiveness of planning as a tool for ensuring purposeful development of both the economy and technology.

Methodology.

The study of the formation of planning paradigms through economic history involved the analysis of various aspects, from the study of the dynamics of the development of socio-economic processes and their predictability to the analysis of the conceptual foundations of planning and the prerequisites of forecasting tools. This determined the complex use of general scientific and special research methods. To study the historical periods of the development of society in the context of its predictability, a historical-retrospective and chronological analysis was conducted. Historical-typological and historical-systemic methods were used to characterize the ideas that dominated in European countries in different historical periods, to analyze their impact on the formation of prerequisites and basic planning hypotheses. To generalize the research of the founders of various economic schools and their critics, general methods of scientific research were used, namely analysis, synthesis, and generalization of literary sources. The methods of induction and deduction were used to study the trend of changing planning paradigms that dominated from the late 19th to the early 21st century. The use of systemic and interdisciplinary approaches made it possible to form a certain idea about the conceptual foundations of planning and forecasting in various historical periods.

Results and Discussion.

The rapidity and radical nature of the changes that have occurred in the social structure of European countries were reflected in the initial assumptions and hypotheses of the established planning paradigms.

Neoclassical planning paradigm. In modern economics, the influence of the neoclassical paradigm (mainstream) was largely preserved. Its foundations were laid out in the late 19th century by W. S. Jevons, K. Menger, M-É-L. Walras. The emergence of neoclassical economic theory was due to the development of capitalism in Europe and the United States. Its main provisions reflected the current conditions of

economic activity of enterprises and a fairly high level of stability in the socio-political life of states in Europe.

This determined the expediency of considering the economy as a system (mechanism) that is in dynamic equilibrium. To maintain such equilibrium, no additional intervention is required. At the same time, each economic agent (entrepreneur, enterprise, state) had the opportunity to use available production factors with the greatest efficiency.

In this case, any economic agent was an integral object, considered as a "black box" in which the transformation of attracted resources into the final product was carried out in accordance with the nature of the production function and the external environment that determined the method of profit maximization as the target function of the existence of the economic system (Hodgson, 1988). The behavior of economic agents was guided by rational preferences, with actions always aimed at maximizing profits based on complete and reliable information, regardless of other economic agents.

The neoclassical approach was based on the assumption that information about the environment (societal development trends, economic system dynamics, achievements of scientific and technological progress) was complete ("perfect"). R. M. Cyert and C. L. Hedrick (1972) noted that the environment determined available resources, manufactured products, the economic agents' behavior and, thus, contributes to the maximization of profits.

Neoclassicists viewed processes in society and the economy as completely deterministic, which allowed them to be viewed as mechanistic. That contributed to the formation of the idea among economic agents that current socio-economic processes would change insignificantly and could be "mechanically" transferred (extended) into the future. That was also associated with the "natural scientific ideal of research, historically inherent in the late 19th century – early 20th century" (Blaug, 1987, p. 13).

The formation of the neoclassical planning paradigm was significantly influenced by the hypothetico-deductive model, which dominated during that period. According to this model, forecasting and planning can only be done effectively if strictly defined "hypotheses" about current and future socio-economic processes in the environment were formed. For such a study, it was also necessary to adopt sufficiently strict restrictive assumptions about the nature of the economic agent and the features of its functioning.

The postulated predetermination of the economic agents' activities and the environment in which they were carried out influenced the approaches used in forecasting and planning. Namely, the possibility of extending already known trends in the development of socio-economic processes into the future enabled to use extrapolation methods. In this case, deviations of actual values from those calculated on the basis of constructed models were considered "obstacles", the size and impact of which could be reduced by taking into account accumulated experience and knowledge about the surrounding world.

The basis of most of the constructions of neoclassical theory, including in planning, was the theory of choice, which allowed an economic agent to choose the

best of all possible outcomes, namely, (i) the criterion for making all decisions was the only one; (ii) the possibilities of receiving and processing information coming from the external environment were unlimited (Cyert & Hedrick, 1972). In this case, when planning, the distribution of available resources could be an optimization task under constraints, which involved finding a conditional extremum (maximum or minimum value) for a certain criterion of the economic agent's efficiency. This enabled the development of an optimization approach to planning.

The implementation of the optimization approach to planning involved solving one of the following problems: (1) minimizing the required volume of financial resources needed to achieve the set goal; (2) maximizing the efficiency of operation with a given volume of own and attracted resources; (3) obtaining an optimal balance between available resources and the expected effect. The emergence of optimization planning and its implementation in the economic agents' activities was the result of a more intensive implementation of mathematical constructions (methods, models) for managing socio-economic processes. During that period, the idea emerged that the level of scientific development was, to some extent, determined by the amount of mathematics used. Then the problem of planning consisted of determining a set of parameters that allowed optimizing the results of the economic agent's activities, taking into account the known limitations of the surrounding world. In the conditions of a stable environment, the development trends of which were understandable to economic agents, the use of the optimization approach allowed for calculating realistic forecasts and making feasible plans.

However, since the early 1950s, increasing instability of the external environment led to the need to apply forecasting as a mandatory component of planning. At the same time, long-term planning and forecasting were based on the assumption of constant and uniform change in the external environment. The consequence of the dominance of the postulate regarding possibility of extrapolating existing trends to the medium and long term was the use of time series analysis and correlation-regression analysis as the main forecasting methods. In conditions of relative stability, the mathematical accuracy of these methods was high enough, which made it possible to develop realistically feasible plans, even in the long term.

In the 1970s, the era of relative stability in the economy ended, which led to a shift in emphasis to the development of alternative forecasting methods. One of the most promising approaches to improve the forecasting of future states was considered to be attempts to apply game theory, which was considered as a generalization of optimization theory for two or more participants in an economic process, provided that their preferences regarding outcomes and restrictions on the set of possible alternatives for each of them were given (Weintraub, 2002). The fundamental difference between game theory and traditional optimization theory was the consideration of existing and possible interaction between participants in the economic process, as well as the possible conflict between them. This difference was reflected in the objective function, which determined the size of the payoff of each player depending on the chosen solution: the payoff of a participant in the economic process depended on the alternatives chosen by both him and others.

The experience of the 1970s and 1980s showed that unpredictable changes in the external environment could seriously disorient the activities of economic agents, since these changes, as a rule, were not trends, but turning points that largely determined the long-term future of corporations. These changes had to be considered as much as possible (Nelson & Winter, 1982).

Based on the above, the following characteristic features of the planning process could be identified from the standpoint of the neoclassical paradigm: (i) the absence of systemic information about the external conditions of the functioning of economic agents; (ii) forecasting was carried out on the basis of the principle that the future was a continuation of the past; (iii) planning was aimed at achieving a state of equilibrium by the economic agent; (iv) the main attention was paid to planning the volumes and structure of resources necessary to maximize profits; (v) the assignment of a strict system of restrictions constructing an optimization planning model.

However, the optimization approach to planning had significant shortcomings: ignoring tasks that could not be described quantitatively; the effectiveness of planning and forecasting largely depended on the completeness, accuracy and degree of correspondence of the constructed model to the actually existing system; the impossibility of constructing an optimization model in which it was possible to describe all aspects of functioning and existing relationships in a complex system. The consequence of this was the planning of only those "rational" parts of the system for which it was possible to build optimization models; the degree of plan fulfillment depended on the desire or unwillingness of workers to act in accordance with the planned goals; the system of control over the fulfillment of the plan was aimed exclusively at detecting and correcting errors, the possibility of which was foreseen in advance.

The optimization approach to planning did not allow for the constant and progressive increase in the rate of change in the environment. In most cases, it was impossible to carry out truly optimal calculations of planned indicators, since it was very difficult, and in some cases impossible, to identify and formalize objective criteria for planning and management. In addition, planning process based on a rational approach "has neither subject nor object; it ignores the nature of the agents implementing the planning and is indifferent to the object of their efforts" (Beauregard, 1987, p. 367). This approach to planning was only acceptable for short-term planning, since developing an optimal comprehensive strategic plan was currently impossible (Ackoff, 1969).

In addition to the identified shortcomings of the optimization approach to planning, it should be noted that changes in the conditions of economic agents' functioning had led to the neoclassical model becoming incapable of adequately describing real processes. This was due to the fact that it was based on unreasonable and unrealistic hypotheses, which negatively affected the quality of model descriptions of economic agents and their relationships with the surrounding world (Nelson & Winter, 1982).

The main criticism stemmed from the assumption of economic agents' rational behavior capable of collecting and processing all available information without any

costs. Even if the models included parameters characterizing the uncertainty of the surrounding world and the expectations of economic agents, the assumption remained that all of them could accurately calculate possible states and, as a result, all expectations would be fulfilled automatically. At the same time, the possibility of the influence of factors that might force them to make an irrational choice was not considered. The result of this was that large corporations that were monopolists in industry markets for the sale of products (services) gradually moved away from the principle of profit maximization as a criterion for the efficiency of functioning (Williamson, 1985).

Thus, the standard assumptions of conditional maximization were no longer sufficient to produce most forecasts (Samuelson, 1991), and therefore plans developed on their basis were not realistic. At the same time, it remained true that in planning, forecasting should not be treated as "some kind of technical exercise". Naive extrapolation or adjusting trends to past facts and data is worthless. This is due to the fact that the future does not necessarily recreate past pictures, which would be very convenient for planning (Brealey, Myers, & Allen, 2019).

The equilibrium hypothesis of the market system also caused fair criticism. R. R. Nelson and S. G. Winter (1982) noted that economic systems were not in a normal state of equilibrium, and economic agents did not act as perfect optimizers. All levels of the economic system were characterized by diversity and heterogeneity, which meant that analysis should focus on the study of changes and dynamics of socio-economic processes, and not on the study of equilibrium points.

R. H. Coase (1990) identified key points in the functioning of corporations that did not fit into the framework of the neoclassical paradigm: (i) the devaluation of the experience of managers, caused by the emergence of fundamentally new tasks; (ii) the complication of management problems caused by the increase in the multiplicity of tasks in connection with the expansion of the geographical boundaries of markets; (iii) the emergence and widening of the gap between the complexity and novelty of tasks, on one side, and the existing management skills gained in the past, on the other side; (iv) the increase in the likelihood of strategic surprises, caused by the increase in the frequency of the emergence of new tasks.

Since the early 1960s, the discrepancy between theoretical models and the practice of forecasting and planning had continued to increase. Thus, well-structured theories of forecasting and planning had been developed, allowing one to obtain supposedly real forecast estimates and planned indicators, which in fact had no relation to reality. This led to economic planning being viewed as an eclectic field associated with neoclassical theory (Friedmann, 1987, p. 39). As F. Archibugi (2007) noted, "the planning process must become more consistent and plans more consistent with the external environment, that is, more rational, at the same time more feasible and become a more sophisticated management tool. Rationality must be identified with reality" (p. 4). At the same time, plans had not only to reflect the existing reality, but also influence it through management and modification. This led to the transition to a new planning paradigm.

Neo-institutional planning paradigm. The formation and development of the neo-institutional paradigm was determined by a set of problems that were maturing in science, namely (i) insufficient attention of neoclassical theory to the environment in which economic agents exist and operate; (ii) a decrease in the predictability of changes in the surrounding world; (iii) an understanding that the rules and traditions developed in society (social institutions) have a significant influence and must be considered in planning. Its foundations were set out in R. Coase's paper "The Nature of the Firm", published in 1937. However, interest in this theory appeared only towards the end of the 1970s. Since this school belongs to the neoclassical direction, its development was conditioned by the increasing gap between the methodology and practice of managing the economic agents' activities in general and planning in particular.

Neo-institutionalism included an analysis of the role of institutions and their influence on the economic agents' activities based on the principles of rationality and methodological individualism. The object of institutional theory is institutions, not human interactions in a space with restrictions set by institutions.

The neo-institutional paradigm is based on the following assumptions:

1) institutions (fixed, interconnected norms that were based on collectively shared values inherent in a particular society or social group, and were generalized as ways of acting, thinking, and feeling) influence the performance of economic agents and the dynamics of the economy as a whole. D. C. North (2003) noted that "institutional change can result from change in the formal rules, the informal norms, or the enforcement of either of these" (p. 12). He classified "constitutions and laws" as formal rules, and "norms of behavior, conventions, and codes of conduct" as informal rules (p. 11);

2) recognition of the limited rationality of economic agents. The most important characteristics of economic agents, as noted by O. E. Williamson (1985), were limited rationality and opportunism, while the pursuit for rationality meant an orientation toward the economical use of limited resources;

3) denial of the principle of maximization as a criterion for the effectiveness of activity: economic agents in their activities were guided to a greater extent not by maximization of the target function, but by acquired rules of behavior and social norms – institutions that determined specific methods for achieving these individual goals;

4) the doctrine of transaction costs – the implementation of any market transactions, including the acquisition of information, was associated with certain costs, that was, the expenditure of resources (money, time, labor, etc.) for planning, adaptation and control over the fulfillment of obligations assumed by individuals in the process of alienation and appropriation of property rights and freedoms accepted in society.

In the early 1990s, the first attempts were made to develop planning theory considering the basic provisions of neo-institutional theory. However, they proved unsuccessful. This was explained by the fact that institutions and their impact on the economic agents' activities were most often described by qualitative parameters, which were very difficult to transform into quantitative ones to be considered in forecasting and planning. Additional difficulties arose from the subjectivity of the perception of the surrounding world by economic agents and the incorrect understanding of ongoing socio-

economic processes, as well as the influence of formal and informal rules and restrictions on them. That significantly complicated economic-mathematical modeling and reduced the quality of forecast and planning models. As N. Verma (2007) noted, "for planning this task is more than incomprehensible" (p. 33).

Neo-institutionalism was manifested in satisfaction planning. In this approach, the main criterion for planning efficiency was the satisfaction of the economic agents' needs. At the same time, efficiency was no longer understood as maximizing profit from the use of limited resources.

The characteristic features of planning from the standpoint of the satisfaction approach were:

1) the development of plans should begin with the definition of goals and objectives that are considered both feasible and desirable. This allows the planning process to find a compromise between the capabilities of the economic agent and the restrictive conditions that existing institutions impose on its activities;

2) the revision of planning goals and objectives is carried out only if they were not feasible;

3) only one feasible and acceptable plan was developed, even if it was not the optimal one;

4) the main requirement for the plans being developed was their feasibility, which was interpreted as minimizing the number and extent of possible deviations from the existing policy and practice of the functioning of the economic agent;

5) the focus of planning was more on recognizing past shortcomings caused by existing policies than on analyzing the exploitation of future opportunities. Identified shortcomings were considered an unaccounted-for institutional influence. This orientation could be explained by the desire of economic agents to minimize transaction costs in the future.

One of the significant disadvantages of satisfaction planning was the attempt to transfer into the future knowledge about existing institutions and their influence on the activities of economic agents through forecasts and plans. D. C. North (2003) correctly noted that "the institutional constraints accumulate through time, and the culture of a society is a cumulative structure of rules, norms, and beliefs that we inherit from the past, that shape our present, and that influence our future" (p. 9). However, they were not predetermined, which increased the complexity of forecasting and planning. Changes in institutions could also be perceived by economic agents either as potential threats to their activities or as new development opportunities. That significantly reduced the feasibility of using the satisfaction approach for long-term planning in conditions of a highly dynamic external environment. Nevertheless, in the context of a transformational economy, taking into account possible changes in forecasting and planning was a necessary condition for obtaining reliable estimates of the future states of the research object.

Furthermore, a significant disadvantage of satisfaction planning was the use of point (single) forecasts, which was justified only in conditions of a deterministic environment. In conditions of unpredictable changes in the surrounding world, that might lead to the

development of unrealistic plans and reduce the manageability of the economic agents' activities.

Evolutionary planning paradigm. The emergence and development of the evolutionary approach was a consequence of the desire of modern scientists to study "poorly organized" (diffuse) systems (Nalimov, 1971). It developed within the framework of the economic mainstream and was called the theory of evolutionary changes in systems.

The evolutionary approach was a relatively new direction in economic science, the origins of which was laid by the works of J. A. Schumpeter. However, the allocation of evolutionary ideas into a separate direction of economic science was associated with the appearance of the publication of R. R. Nelson and S. G. Winter "Evolutionary Theory of Economic Change" in 1982.

Evolutionary economics viewed all processes in the surrounding world as open, spontaneous, and irreversible, undergoing constant development and resulting in quantitative and qualitative changes. They had a constant impact on the activities of economic agents, who had to respond to the changes that occur by adapting to them.

The fundamental assumptions that form the basis of the evolutionary paradigm were the following:

1) heterogeneity of economic agents: evolutionary economics accepted their differences within the accepted framework of established thinking and rejects the "unification" underlying neoclassical theory. It was accepted that the behavioral differences between economic agents were so significant that the use of the statistical average method did not allow not only to conduct a correct analysis of functioning, but also to understand the mechanism of occurrence of changes;

2) variability, selection and conservation: most evolutionary models were based on the Darwinian theory of variability and natural selection. The possibility of constant and varied changes in the economy determined the selection of economic agents, taking into account the limited scarce resources. Based on the existing diversity, a "viable population" of economic agents was determined and, consequently, their average characteristics;

3) uncertainty: "true" changes in the external environment were always accompanied by uncertainty, which could not be described in probabilistic terms. This uncertainty meant that the future was "open" to qualitative changes and could not be predicted through the past and current states of economic agents;

4) entrepreneurship: economic agents were motivated to act creatively. When faced with uncertainty, they had to seek new ways to solve emerging problems. Economic activity was viewed as an open learning process that involved a sequence of entrepreneurial hypotheses, experiments, and refutations of ineffective solutions to emerging "problems" of the external environment;

5) nonequilibrium dynamics: evolutionary models rejected equilibrium as a desired state and explored the behavior of systems far from equilibrium, particularly with respect to self-organization.

In evolutionary theory, an economic agent was considered as one of many similar objects that could be considered ("likened") as a biological population. In that case, the

behavior of a specific economic agent was determined by two aspects (Kleyner, Tambovtsev, & Kachalov, 1997): (i) relationships between members of a given population; (ii) internal characteristics of the economic agent, which included routines, that was, "normal and predictable patterns of behavior" in response to internal or external influences. According to "evolutionists", it was routines that influenced the decision-making of an economic agent, and not the desire to maximize profit under any conditions. At the same time, routines were not established once and for all, but were changed in accordance with the external environment.

Recognition of the variability of the surrounding world and the economic agents operating in it necessitated the formation of a new approach to planning, namely, an evolutionary paradigm, which was based on:

(1) a systemic representation of an economic agent as a dual object: on the one hand, it is a member of a "population" and its activities reflected all the consequences of the evolution of this community, and, on the other hand, it had its own routines, which were reflected in the features of functioning, decision-making algorithms and features of reaction to changes in the surrounding world (external environment);

(2) recognition of the "instability" of the conditions for implementing the plans of economic agents, the consequence of which was the need to take into account both in production plans and in plans the possibility of maneuvering to achieve the set goals of existence (development).

According to the evolutionary theory, the activity of an economic agent in a changing environment is effective (successful) if it has the ability to adjust (adapt) to the changes that arise (Ackoff, 1969). Despite the fact that changes in the surrounding world were spontaneous, the adaptation of economic agents to them had to be purposeful and controlled (Innes & Booher, 1999). That contributed to the formation of the evolutionary planning paradigm or, in other words, adaptive planning.

Adaptive planning was based on three main principles: (i) the main benefit lay in the planning process itself, not in having plans already made; (ii) the modern need for planning was generated mainly by the lack of effective management and control, so the goal of planning should be to create a system that could minimize the need for retrospective planning and preserve forward planning aimed at creating the desired future; (iii) each type of knowledge about the future (certainty, uncertainty and ignorance) required its own way of planning: by commitments, options or reactions.

Adaptive planning was based on these assumptions was the definition of the development goals of an economic agent in a surrounding world, the justification of ways to achieve them considering the available volumes of necessary resources. In this case, the possibility of (1) the emergence of factors that destabilized the economic agent's activity, as well as (2) the reduction of their negative impact should be taken into account. When planning, a comprehensive assessment of an economic agent's resources, directions for their most effective use, as well as available sources of their replenishment should be carried out. Then, as a result of adaptive planning, a planned development trajectory of an economic agent might be formed with an assessment of its sustainability in the surrounding world, with the identification of "narrow" and "wide" places of its implementation to control the effectiveness of adaptation to the current conditions.

As noted by R. L. Ackoff (1969), the use of adaptive planning allowed economic agents to respond flexibly and promptly to changes in the external environment and to adapt to them effectively by taking these changes into account in operational and strategic planning, as well as in budgeting.

At that time, adaptive forecasting methods were actively used. They were based on maintaining the inertia of the economic agent's development, but taking into account the factor of "obsolescence" of data. The advantage of adaptive forecasting models was the ability to quickly change (adapt) its structure and parameters when trends changed, as well as any fluctuations in which a pattern could be traced. That allowed us to consider only those trends that had not yet become outdated and still had an impact on the economic agent's activities, which was achieved by assigning different weighting coefficients depending on the distance of the indicators from the moment of forecasting.

Within the evolutionary paradigm, the most widely used models were those based on the exponential smoothing procedure, since they allowed for constructing adaptive forecast models in conditions where there was no reliable information about the nature of changes in the dynamic characteristics of processes. The lack of information led to the use of the "only reasonable" assumption in such a situation about the slow drift of these characteristics. However, G. Midgley (2000) noted that the limitations of using adaptive forecasting methods had not yet been studied.

By means of an adaptive planning system it was possible to carry out passive (changes in the behavior of the economic agent) and, if possible, active (the economic agent itself changes the external environment) adaptation to ensure its more efficient functioning and development in the present or future.

When implementing the adaptive approach, the following initial planning principles were adopted:

1) economic agents did not have a single criterion for the optimality of decisions made. That criterion was strictly individual and reflected not only individual preferences, but also the historical experience of functioning;

2) optimality of planning did not necessarily correspond to the principle of maximizing the efficiency of activities. In addition, efficiency was not always synonymous with adaptability to changes in the external environment;

3) economic agents were considered as dynamically stable complex systems, subject to strength tests by random impacts of environmental factors, therefore the efficiency criterion was dynamic, changing from period to period;

4) uncertainty was an uncontrolled variable;

5) planning considered future scenarios while being informed by past and present conditions;

6) in forecast models of the economic agents' activities, the potential for variability of all forecast parameters had to be taken into account: goals, indicators, criteria, principles, etc.

However, adaptive planning had significant shortcomings that negatively affect its effectiveness. Firstly, the evolutionary planning paradigm could be applied only if changes in the surrounding world and the economic agents' activities were predictable. Otherwise, forecasts and plans were unrealistic. Secondly, to date there is no developed

methodology that allow for effective planning (really implemented plans) in current conditions. Thirdly, adaptive planning does not take into account the structural components of the surrounding world, their dynamics nor their impact on the economic agents' activities.

The conducted research showed that during the analyzed period there was no fundamental change in planning paradigms, and the driving force behind their development was the increasing discrepancy between theoretical provisions and the needs of planning practice (Fig. 1). Thus, at the first stage of a new planning paradigm's formation, there was maximum correspondence between theory and practice in terms of the main idea, the orientation of planning work, and the results.

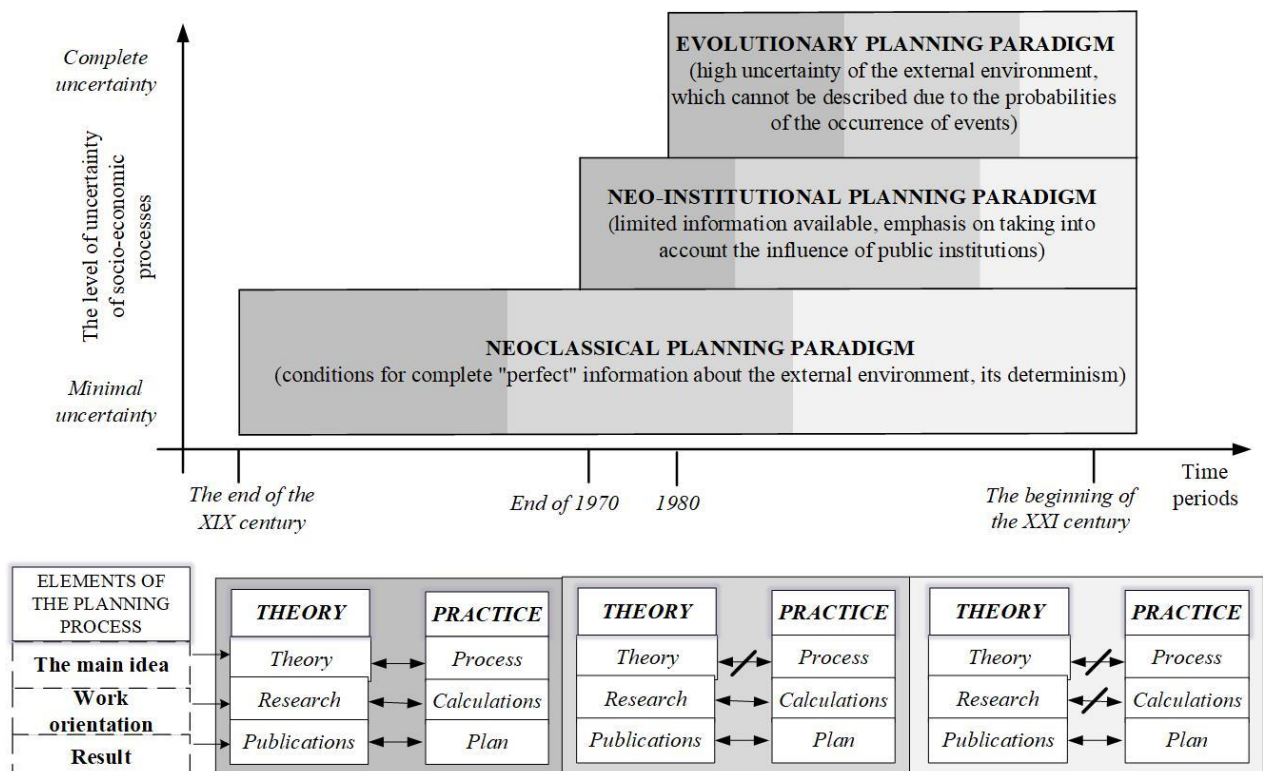


Figure 1. Change of planning paradigms from the late 19th century to the early 21st century (Own elaboration).

Changes in the surrounding world, a decrease in the predictability of the socio-economic processes' development, and an increase in the complexity of their influence on the economic agents' activities primarily led to a gradual increase in the discrepancy between the basic idea of the paradigm, the orientation of planning work and, as a consequence, the results of planning.

Conclusions.

As a result of the research, new information about the formation of planning paradigms through the economic history of the end of the 19th – the early 21st centuries obtained. It allowed us to characterize the planning paradigms' genesis as a reflection of the socio-economic processes' features that dominated during the analyzed period.

1. The analysis of the initial prerequisites and conditions for the formation of planning paradigms allowed to identify the main driving force behind their change in the degree of stability and predictability of socio-economic processes. The growing uncertainty in the surrounding world formed a significant gap between the theory and practice of planning, which reduced its effectiveness.

2. Summarizing the formation of planning paradigms throughout economic history from the end of the 19th century to the early of the 21st century, three periods distinguished: I. Dominance of the neoclassical paradigm (from the late 19th century to the 1970s); II. Dominance of the neo-institutional paradigm (from the late 1970s to the late 1980s); III. Dominance of the evolutionary paradigm (from the late the 1980s to the early 21st century). The neoclassical planning paradigm was based on the assumptions of high stability and predictability of socio-economic processes, which allowed economic agents to act rationally and carry out optimization planning by extending past trends into the future. The neo-institutional planning paradigm was based on considering the influence of societal institutions and their impact on activities, which allowed for the development of plans aimed at achieving efficiency that met the needs of economic agents. The evolutionary planning paradigm was based on considering the variability of the surrounding world, understanding the impossibility of predicting and describing quantitative and qualitative changes through past events and the ability of an economic agent to adapt to these changes.

3. The change of paradigms did not involve abandoning the previous one; instead, it became the basis for the next, taking into account changes in socio-economic processes and their predictability. The feature of the planning paradigms' genesis was its parallel use.

The issue of the economic paradigms' development is complex and multifaceted, which requires further thorough research. Thus, the growing unpredictability of the external environment dynamics, the formation of new trends (shifting the emphasis on client-oriented activities, the growing importance of external collaboration, etc.) actualized the need for research into its impact on the conceptual foundations and tools of planning and forecasting. Separate research can also be devoted to the study of the impact of technological progress's, in particular information technologies, on the development of planning theories and forecasting tools.

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Парадигми планування через економічну історію

Анотація. *Планування було, є і буде найважливішою складовою наукової та практичної діяльності людей, що пов'язано з необхідністю здійснення цілеспрямованого розвитку науки, техніки, суспільства. Стаття присвячена дослідженню розвитку планування в контексті історії економіки та економічної думки. Метою статті є дослідження формування парадигм планування протягом економічної історії як відображення особливостей соціально-економічних процесів, що домінували з кінця XIX століття та до початку XXI століття. Для досягнення поставленої мети використовувалися загально наукові (аналіз, синтез, індукція та дедукція, узагальнення літературних) і спеціальні (історико-ретроспективний, хронологічний, історико-типологічний, історико-системний методи) методи. Результати дослідження показали, що основною рушійною силою генезису є зміна ступеня передбачуваності соціально-економічних процесів та рівня невизначеності їх майбутнього розвитку. Історичний процес формування парадигм планування поділяється на три періоди домінування: I. Неокласичної парадигми (з кінця XIX ст. до 1970-х років); II. Неінституційна парадигма ((з кінця 1970-х до кінця 1980-х років); III. Еволюційної парадигми (з кінця 1980-х років до початку XXI ст.). Формування неокласичної парадигми було обумовлено розвитком капіталізму в Європі та засноване на припущенні про передбачуваність динаміки соціально-економічних процесів. Це дозволяло здійснювати оптимізаційне планування шляхом продовження у майбутнє тенденцій, які склалися у минулому. Необхідність розгляду поточного та майбутнього стану інституцій та їх впливу на діяльність економічних агентів (підприємств, компаній, держави) обумовила формування неінституційної парадигми планування. Визнання нестабільності середовища привело до формування еволюційної парадигми планування, заснованої на врахуванні тенденцій у навколишньому середовищі, що змінюється, та їх динаміки, а також можливості економічних агентів адекватно реагувати (адаптуватися) на них. Одним з основних факторів формування нових парадигм планування стало*

поглиблення розриву між теорією і практикою планування, наслідком чого була неможливість отримання достовірних перспективних прогнозів при використанні загально вживаного інструментарію прогнозування. Однією з особливостей формування парадигм планування є паралельне використання, що дозволяє забезпечити їх розвиток з урахуванням соціально-економічних процесів, що склалися.

Ключові слова: історія економіки; планування; нестабільність; розвиток; соціально-економічні процеси; середовище

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