DOI: 10.61954/2616-7107/2024.8.2-7 *ISSN 2616-7107*

UDC 330.34
JEL: M 21, O20, O33

THE EVOLUTION OF THE THEORY OF INNOVATION ECOSYSTEMS IN THE CONTEXT OF STRATEGISATION

Maryna Petchenko*
University of Information and Communication Technologies, Kyiv, Ukraine
ORCID: 0000-0003-1104-5717

Hanna Telnova
National Aviation University, Kyiv, Ukraine
ORCID: 0000-0002-5724-7229

Oleksandr Yakushev
Cherkasy State Technological University, Cherkasy, Ukraine
ORCID: 0000-0002-0699-1795

Olha Kuzminova
National Aviation University, Kyiv, Ukraine
ORCID: 0000-0002-6900-1074

*Corresponding author:
Email: marinapetcenko@gmail.com

Received: 23/02/2024
Accepted: 30/05/2024

DOI: 10.61954/2616-7107/2024.8.2-7

Introduction. The theory of innovation occupies one of the leading positions within the modern paradigm of economic development, as innovation is recognised as a driver of productivity improvement and cost optimisation, microeconomic stability, and macroeconomic growth. The determinants of innovation theory have become more profound, forming a synthesis with theories of economic cycles, technological development, entrepreneurship, management, and decision-making. Consequently, the theory of innovation has evolved, and the study of this process provides an up-to-date view of the theoretical foundation of innovation ecosystems.

Aim and tasks. The aim is to systematise the stages of the evolution of the theory of innovation and strategic management and formalise the theoretical foundation of the modern theory of innovation ecosystems in the context of strategisation.

Results. A systematic study of the genesis and ontogenesis of the theory of innovation and anagenesis of the theory of innovation ecosystem in the context of strategisation led to the determination of the characteristics of aromorphosis. Genesis and ontogenesis include the growing complexity of the innovation ecosystem and its adaptability to the changing innovation ecosystem in the long term, the dynamism of the composition of the innovation ecosystem without changing its strategic goals, the need for a second level of adaptation of the strategy of an individual actor within the strategy of the innovation ecosystem and strategic role, and increasing the integration of actors of the innovation process into systemic business processes (planning, organisation, motivation, control). Actors' joint development within the ecosystem on mutually beneficial terms and possibilities for the strategic expansion of the innovation ecosystem locally and globally were analysed. In addition, the externalities of the development and spread of innovative ecosystems are outlined, and their strategic orientations are formulated.

Conclusions. Due to anagenesis, an innovative ecosystem based on strategising improves adaptive resistance to changes in the external environment. Aromorphosis of an innovative ecosystem within anagenesis makes it possible to consider the properties of adaptation to the changing innovative ecotope as the basis of its theoretical foundation in the long term, the dynamism of the composition of the innovation ecosystem without changing its strategic goals, and the increasing integration of innovation process actors into systemic business processes.

Keywords: innovation, ecosystem, strategic management, ontogenesis, anagenesis.

1. Introduction.

Economic thought was transformed during the entire period of research. Proposing new hypotheses, updating fundamental knowledge and empirical evidence, and shifting the focus of economists' attention give rise not only to the addition of theoretical concepts to fundamental theories but also to their essential transformation and the evolution of the economic development paradigm.

The theory of innovation occupies one of the leading positions within the modern economic development paradigm, as innovation is recognised as a driver of productivity improvement and cost optimisation, microeconomic stability, and macroeconomic growth. The determinants of innovation theory become more profound, synthesising theories of economic cycles, technological development, entrepreneurship, management, and decision-making. As a result, the theory of innovation has evolved, and the study of this process makes it possible to substantiate an up-to-date view of the theoretical foundation of the innovation ecosystem.

2. Literature Review.

2.1. The Origin of the Innovation Theory.

The scientific achievements of Schumpeter (1934) formed the basis of innovation theory. However, in terms of the genesis of innovation theory, one should point out the position of the classical economic theory. Smith (1904) believed that the promotion of innovation (mainly new inventions of equipment) occurred as a result of the division of labour.

Say (2001) pointed to the benefits of innovation for consumers, which were manifested in lower prices and improved product quality. At the same time, supporters of classical theory considered innovation a less important factor of economic growth compared to land, capital, or labour, and the role of knowledge and skills of human capital was almost ignored.

In addition, it points to the influence of the theories of cyclical development (the theories of cyclical crises and "long waves"), the theories of technocratic society (technocratic theory, the theory of managerial revolution, the theory of stages of economic growth, the theory of technological gap, technological determinism and convergence, and industrial-technocratic society). While theories of cyclical development explain the role of innovation as a necessary element of economic development, neo-institutional theories of technocratic societies emphasise the relations and connections between institutions and technological innovations. In particular, Veblen (1995) believes that institutions are transformed through adaptation to technological changes (quality of technological equipment, experience, or skills) or changes in the socio-economic sphere.

Thus, these theories were the foundation of Schumpeter's theory of innovative development, which mainly focuses on technological innovations and their role in the economic cycle. The theory of innovation is developed into the following theories: the theory of cyclicality, the theory of innovative development, the theory of diffusion of innovations, and the theory of spatial diffusion of innovations.

The evolutionary economic theory (Nelson & Winter, 1982) deserves attention. This explains innovations concerning competition and the need to acquire competitive advantages. The endogenous growth theory (Romer, 1986) emphasises the role of innovation in creating positive external effects. The specified theory stresses the importance of technical progress as an endogenous variable and indicates that research and development (R&D), human capital, and investments are factors of economic growth.

On the whole, it is possible to regard the evolution of forms of interaction in the process of innovative development through the prism of behavioural theory (formation of perspective theory and motivation theory), the theories of partnership (the theory of public-private partnership, the theory of local partnership), the theories of integration (the theories of social systems), the theories of cluster development (Triple Spiral Model), the theory of innovative cooperation (the theory of innovation ecosystem, the theory of spatial interaction and innovative growth, the theory of innovation networks, the theory of open innovation). Innovative theories have evolved according to the number of elements and levels of innovation structuring.

2.2. The Theory of Innovation Systems.

Attention should be paid to the evolution of the theory of innovation under the influence of the theory of general systems and synergy in the theory of innovation systems. Thus, Lundvall (1992) and Freeman (1995) developed the theory of innovation systems in the 1980s.

In 1995, the triple helix model of innovation (Etzkowitz, 1995) was developed. It describes the dynamic interaction among academic spheres (universities and research institutions), industrial companies, and the state. According to scientists (Carayannis & Campbell, 2009), such cooperation ensures the growth of entrepreneurial and innovative activities and economic growth in a knowledge-based economy.

Over time (2009-2010), scientists improved the model of the triple helix, adding to it a fourth component – society as the final consumer of innovations (Quadruple Helix (Carayannis & Campbell, 2009)) and a fifth component – the environment on which innovations influence, and environmental protection institutes, accordingly, impose environmental requirements on innovative products (Quintuple Helix) (Carayannis & Campbell, 2010).

Another direction for developing cooperation of subjects within the innovation system, spatial, was developed in the concept of regional clusters by Porter (1998a, 1998b). Further, cooperation between interconnected firms and institutions at the regional level is also considered to increase competitiveness, which contributes to the growth of the productivity of companies, universities, and other business entities, as well as subjects of the regional and national economy.

The transformation of the theory of innovation systems has gained significant scale with the development of the open innovation paradigm of Chesbrough (2005), which indicates the flow of knowledge and innovation outside the boundaries of the organisation. It involves the active exchange of knowledge and cooperation outside the organisation's traditional boundaries and is the basis of many development business models (Chesbrough, 2005).

According to the paradigm of open innovation, companies have broad access to technologies, and resources based on partnerships with third-party entities (sellers, suppliers, customers, start-ups, and individuals), thereby acquiring significant potential for growth and competitiveness (Plaksiuk et al., 2023a). Open innovations enable cost optimisation, speed up market access, and share risks and investments among partners.

The theory of innovation networks, the founder of which is considered Gloor (2006), aims to explain the complex organisational relationships among the subjects of the innovation system. The complexity of such a structure is explained by the variability in the composition of the innovation system, the various spheres of activity of the participants, and the criteria of their final product. Simultaneously, the reflection and contribution of the innovation system participants should be subordinated to the agreements within the framework of a single goal. Thus, the theory of innovation networks is based on the methodology of formalisation of a cognitive map containing nodes (participants of the innovation system) and graphs connecting them (connections among participants of the innovation system), which organises the structure of the innovation system and also makes it possible to manage it through the setting of combinations of connections and their monitoring and coordination of business processes of the innovation system.

The concept of entrepreneurial ecosystems by Moore (1993), which gave an impetus to the development of innovation ecosystem theory, is seen today as the top development of this system. Nowadays, attempts are being made to improve the methodology for the functioning and development of innovative ecosystems and develop their methodological basis and instrumental apparatus. At the same time, the innovation ecosystem theory has significantly influenced the evolution of other theories, such as the theory of entrepreneurship, management, and decision-making. It is rational to consider the evolution of innovation theory within an innovative ecosystem based on its anagenesis, the principles of which are rarely used in economic research, and the term is mostly used in biology.

However, a certain association between innovative and biological ecosystems creates the basis for analysing its theories, given their anagenesis.

This research aims to systematise the stages of the evolution of the theory of innovation and strategic management and formalise the theoretical foundation of the modern theory of innovation ecosystems in the context of strategisation.

3. Methodology.

Recognising the strategically important role of innovations in socio-economic development processes, a hypothesis about the significant convergence of innovation and strategic management theories was proposed based on their joint evolution and consolidation as a generally accepted postulate of economic development. In view of this, there is a need to formulate the theoretical foundation of the modern theory of innovative ecosystems (as one of the evolutionary forms of the theory of innovations) in the context of strategisation, which requires a deep analysis of the transformation of these theories.

Regarding the research of theories, scientists traditionally consider their genesis, ontogenesis and evolution. The fundamental differences in the specified methodological problems determine the fundamentally different results of the research.

Thus, genesis is the study of the origin of a theory from its first idea.

Further development of the theory is ontogenesis, that is, the process of unfolding the provisions of the theory, its complications, and detailing.

Evolution refers to the process of development through gradual change. In addition, similar to ontogenesis, evolution usually refers to a process that produces a better or more complex form. However, unlike ontogenesis, which considers the development of theory in its single form, evolutionary development refers to transforming the original state and creating new forms.

Anagenesis characterises the transformation of one species into another with different characteristics, that is, progressive evolution. At the same time, when discussing anagenesis, the following is meant:

The first is evolution due to adaptation to the external environment (in the case of the author's vision of an innovative ecosystem – to an innovative ecotope). Having a dynamic structure and flexible organisation of business processes, the innovative ecosystem in the author's vision fully corresponds to this characteristic of anagenesis.

Second, the presence of a large variety of extinct and existing organisms, and in association with an innovative ecosystem, the presence of a group of innovative ecosystems. According to a report on the startup ecosystem (Farvest, 2022), the number and effectiveness of innovation ecosystems worldwide are increasing.

Third, the organisation of internal and external structures and functions is complex. Examples of improvements in models of innovative systems (up to the level of a five-level spiral quintuple helix) also testify to the observance of this anagenesis attribute.

Anagenesis, as a type of evolution, is considered concerning the development of objects, in which there are trends of species transformation towards complications, which fully corresponds to the theory of the innovative ecosystem. Researchers of anagenesis argue that this leads to the appearance of species with new characteristics and abilities that surpass the characteristics and abilities of ancestors (Dobzhansky et al., 1977).

The basis of the understanding of anagenesis is the criterion of aromorphosis, that is, an increase in the system's complexity associated with the expansion and complication of the functioning conditions. In biology, an example of aromorphosis is the transition from unicellular to multicellular organisms, which associatively corresponds to the transition from the theory of innovations to innovative systems and later to innovative ecosystems, with the expansion of the number of actors and the acquisition of adaptive properties of the system.

It is appropriate to consider the evolution and anagenesis of the theory of innovative ecosystems in the context of strategising, as recent studies increasingly indicate the convergence of theories.

4. Results.

4.1. Staging of the Development of the Theory of Innovation and Strategic Management.

Considering the parallel evolution of the theories of strategic management and the theory of innovation, it is possible to single out the following common stages.

The scientific formation of the theory of strategic management and theories of innovation took place until the 1970s of the 20th century. During this period, there was a transition from budgetary and long-term planning to strategic planning. Ansoff (1965) and Chandler (1969) are considered to be the founders of this approach. The strategy was seen as a company plan concerning its environment, in which both internal and external aspects are essential. An example of analytical tools developed in that period included SWOT analysis, which examines both internal (strengths and weaknesses) and external (opportunities and threats) characteristics of companies and strategic matrices (BCG matrix or McKinsey's business strength and market attractiveness matrix).

As indicated in the above research, innovation is understood in this period as a factor of economic growth at the macro level and economic development at the micro level. Due to the strategy of establishing a plan based only on strategic analysis and evaluation, innovations in this period were only subject to such a static evaluation for positioning the company in the market and preparing the plan.

During the 1970-1980, strategic planning changed to strategic management, and the scientific search for strategic success gravitated both to the external environment, particularly competitive markets (Porter, 1980), and to the internal one – the company strengths and weaknesses in the market. Innovations during this period were also implemented based on market conditions and consumer requests for innovations.

In the 1980s and late 1990s, strategic management theories focused on managing resources and potential, which allowed companies to gain competitive advantages. Research shifted towards the structure of production. Attention in strategic management was focused on contractual relations among the actors within the agency theory framework.

The availability of strategically valuable resources and possibilities was perceived as the primary source of a company's competitive advantage, and innovation was considered a strategic resource and the source of competitive advantage. In particular, the knowledge economy paradigm (Nonaka, 1994) began and developed.

Organisational knowledge and human capital became an aspect of strategic management in it. In this sense, attention was paid to the permanent innovative process of updating and improving products to increase the possibilities of adaptation to the external environment and market requirements (Telnova, 2023) through the offer of innovative and unique value.

In this period, the development of endogenous economic growth theory determined the introduction of innovative processes on an interactive basis, system and cluster approaches to the organisation of innovative activity at the macroeconomic level were beginning to be applied.

In the 1990s, the theory of strategic innovation was launched. It connected innovative projects with strategic goals within the business strategy, and strategic innovation itself was considered a necessary attribute of survival in a volatile market (Markides, 1997).

After the 2000s, strategic management has acquired a complex character. Foreign researchers identify seven critical components of strategic management at this stage: performance, strategic initiatives, external environment, internal organisation, managers/owners, and resources (Nag et al., 2007). At the same time, the focus of competitiveness shifts from advantages to opportunities. This is the basis for the emergence of the theory of strategic entrepreneurship (Ireland et al., 2001; Ireland et al. 2003; Ireland & Webb, 2007), which combines the entrepreneurial behaviour of searching for possibilities with strategic management, that is, the search for advantages. Along with the fact that the theory of strategic entrepreneurship is aimed at the internal environment (resources and procedures), its content is interpreted as an activity that moves the economy in new directions by recombining the company's resources, activities and procedures.

Moreover, the entrepreneur, an economic agent who lacks resources but is informed of possibilities that can be turned into profit, acts to realise these opportunities through resource mobilisation and stirring up the activity (Mathews, 2010). The speed of decision-making (strategic sensitivity), coordination and rapid mobilisation of efforts and resources become essential aspects of management and decision-making in this theory (Doz & Kosonen, 2010).

It is possible to connect the following attributes of strategic entrepreneurship (mobilisation of resources, speed of decision-making (strategic sensitivity), coordination) with the development at the same time of a systemic innovation paradigm based on the theory of open innovation, and later on the theory of the innovation ecosystem.

Moreover, during this period, the theory of strategic innovations continues to develop, which already means creating new or reformatting existing markets and the growth of value for customers (Gebauer et al., 2012). Therefore, strategic innovation aims to achieve competitive advantage by creating value for customers and new markets (Doz & Kosonen, 2010).

Since the 2010s, the need to form a theory of strategising the development of the innovative ecosystem has become topical, as research in this area is quite fragmentary.

Thus, the periodisation of the evolution and anagenesis of the theories of strategic management and the theory of innovations is given in Table 1.

Table 1. Parallel evolution and anagenesis of strategic management theories and innovation theory.

Period	Evolution of strategic management theories	Evolution of innovation theories
The period of scientific formation of the theory of strategic management and innovation theories (until the 1970s)	Gradual transition from budget planning (the 1940-1950s) to long-term planning (the 1950-1960s), later – to strategic planning (the 1960-1970s) Attention paid to the strategic plan	Innovation is understood as a factor of economic growth at the macro level and economic development at the micro level. A linear innovation paradigm based on neoclassical economic theory
The period of rethinking and development of theories (the 1970s - early 1980s)	Transition to strategic management. The strategy was aimed at forming a plan and managing results based on market competition and macroeconomic factors	Innovations are also implemented based on market conditions, consumer requests for innovations.
The period of intensive implementation (the 1980s - late 1990s)	Strategic management taking into account external and internal factors, institutional environment; the paradigm of the knowledge economy starts and develops; organizational knowledge and human capital become an aspect of strategic management. Attention is paid to the permanent innovation process of improving the possibilities of offering innovative and unique value	The development of the theory of endogenous economic growth conditioned the introduction of innovative processes on an interactive basis, system and cluster approaches to the organization of innovative activities are beginning to be applied
	Introduction of the theory of strategic innovations	
The period of transformation of theories and their joint development (the 2000s - 2010s)	The emergence of the theory of strategic entrepreneurship. Attributes of strategic entrepreneurship (mobilization of resources, speed of decision-making (strategic sensitivity), coordination) are considered possible to be associated with the development of a systemic innovation paradigm based on the theory of open innovation, and later on the theory of the innovation ecosystem. The theory of strategic innovations continues to develop	
The period of formation of the theory of strategizing the development of the innovative ecosystem (since 2010 till the present)	The presence of fragmented studies on problematic issues of strategizing the development of the innovative ecosystem.	

4.2. Formalization of the Theoretical Foundation of the Theory of the Innovation Ecosystem on the Basis of Strategisation.

It can be seen that the strategic role of companies in the innovation ecosystem is determined by the contribution to value and its substitutability in the investment process (Table 2).

Such strategic roles of actors in the innovation ecosystem can be characterized through association with the biological ecosystem:

– Neutrality of actors – cooperation of actors on the creation of a value proposition in the ecosystem, in which actors do not receive additional effects (either positive or negative), i.e. the result of value creation is the same as in the case of independent activity;

– Proto-cooperation of actors – mutually beneficial, but not mandatory cooperation of actors (substitutability of one of the actors in the ecosystem is high), from which they benefit in the form of an additional effect of the creation of the value;

– Mutualism of actors – mutually beneficial cooperation of actors, without which they cannot function (substitutability of actors in the ecosystem is zero);

– Commensalism – cooperation of actors, in which one of the actors receives an additional effect from cooperation, and the position of the other is neutral;

– Predation – cooperation of actors, in which one of the actors ("predator") uses the results of the activity of the other without appropriate compensation (payment for work, reproduction of spent resources), which leads to the bankruptcy of the "victim";

– Parasitism – a type of cooperation between actors when the "parasite" does not bring the other actor ("host") to bankruptcy, but for a long time uses the results of its activity as a resource for its livelihood, without creating any component of the value proposition within the ecosystem;

– Competition – the type of cooperation of actors, for which they compete with each other for the resources of the external environment due to their shortage;

– Amensalism is a type of cooperation between actors in which one actor affects the other and suppresses its activity without feeling a reciprocal negative influence.

A generalisation of the theoretical foundations of the development of the innovative ecosystem in the context of strategisation is shown in Fig. 1.

Table 2. Attributes of actors of the innovation process.

Actors	Function	Entered value	Substitutability
Producers of fundamental ideas are research institutions, university scientific circles	Generation of a creative idea based on market research and consumer needs	An idea of the form and method of satisfying demand through the core of the value proposition	Evaluated by competition in the industry
Subjects of applied SRW - scientific research institutions, university scientific circles (if there is a material and technical base), engineering companies, technology parks, technology transfer centres	Scientific and technical transformation of a fundamental idea into a product sample and technical documentation	Product samples, prototypes, experiments, production technology and technical documentation for serial production, intellectual property rights	
Companies producing innovative products	Commercialization of innovations	A product ready for final consumption	
End users of innovations	Generate requests, requirements for the value proposition; offset the costs of development and production of an innovative proposal, and pay a fee that shapes the financial results of researchers, developers and manufacturers	The consumer is the source of innovation	Evaluated by market capacity

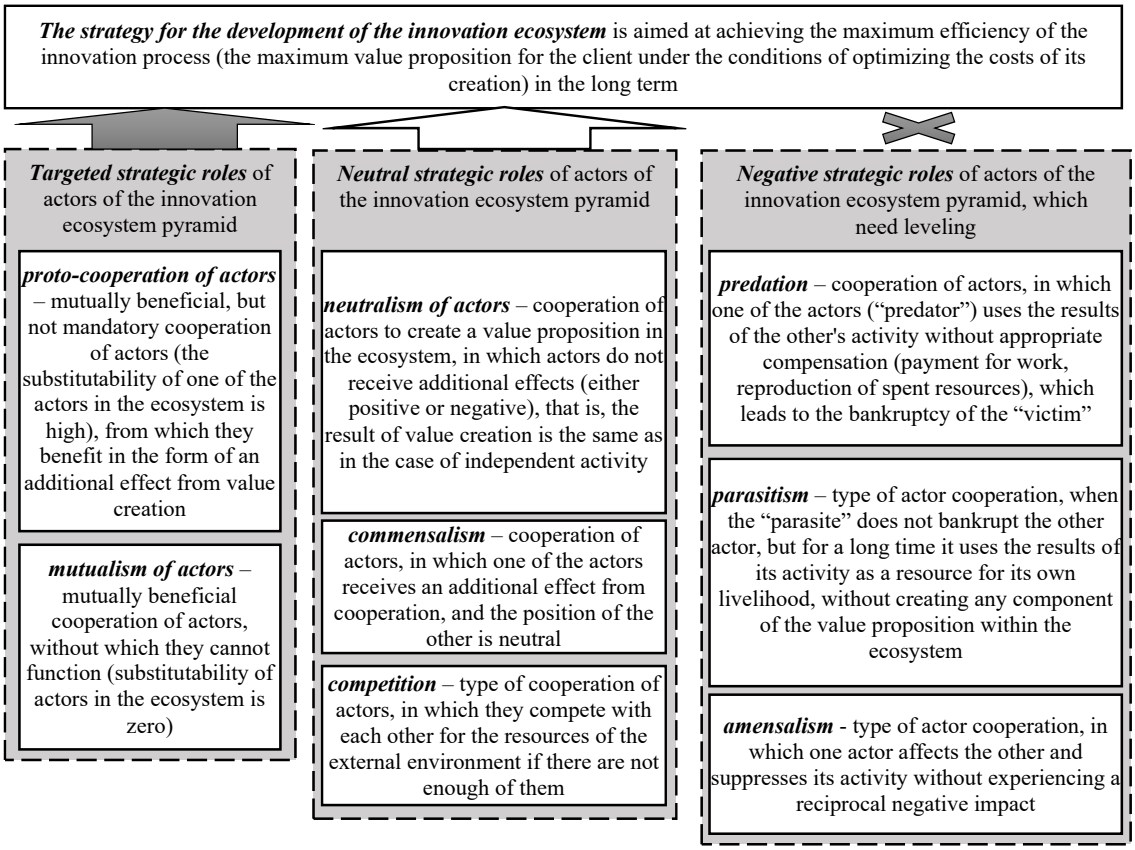

Fig. 1. Theoretical principles of the development of the innovation ecosystem in the context of strategisation.

Returning to the aromorphosis of the theory of the innovative ecosystem, we indicate the context of strategizing, which includes the following characteristics:

– growing complexity of the innovation ecosystem and its adaptability to the changing innovation ecosystem in the long term;

– the dynamism of the composition of the innovation ecosystem without changing its strategic goals;

– the need for a second level of adaptation of the strategy of an individual actor within the strategy of the innovation ecosystem and strategic role;

– increasing the integration of actors of the innovation process into systemic business processes (planning, organization, motivation, control) and their joint development (Plaksiuk et al., 2023b) within the ecosystem on mutually beneficial terms;

– possibilities for strategic expansion of the innovation ecosystem locally and globally.

The specified characteristics of aromorphosis make it possible to hypothetically predict the externalities of the development and spread of innovative ecosystems, which consist of displacing competitors with simpler forms from the market because they lack the necessary and powerful properties of flexibility and dynamism inherent in innovation ecosystems.

Strategic orientations that form the basis of the theory of innovation ecosystems as a result of the anagenesis of the theories of strategic management and innovation: expansion of market coverage, increasing the adaptive stability of actors of the innovation ecosystem in the innovation ecotope and the external environment outside the boundaries of the innovation ecosystem; self-improvement of the actors of the innovation ecosystem through their joint evolution. The research results on the genesis, ontogenesis and anagenesis of the theory of innovations are shown in Fig. 2.

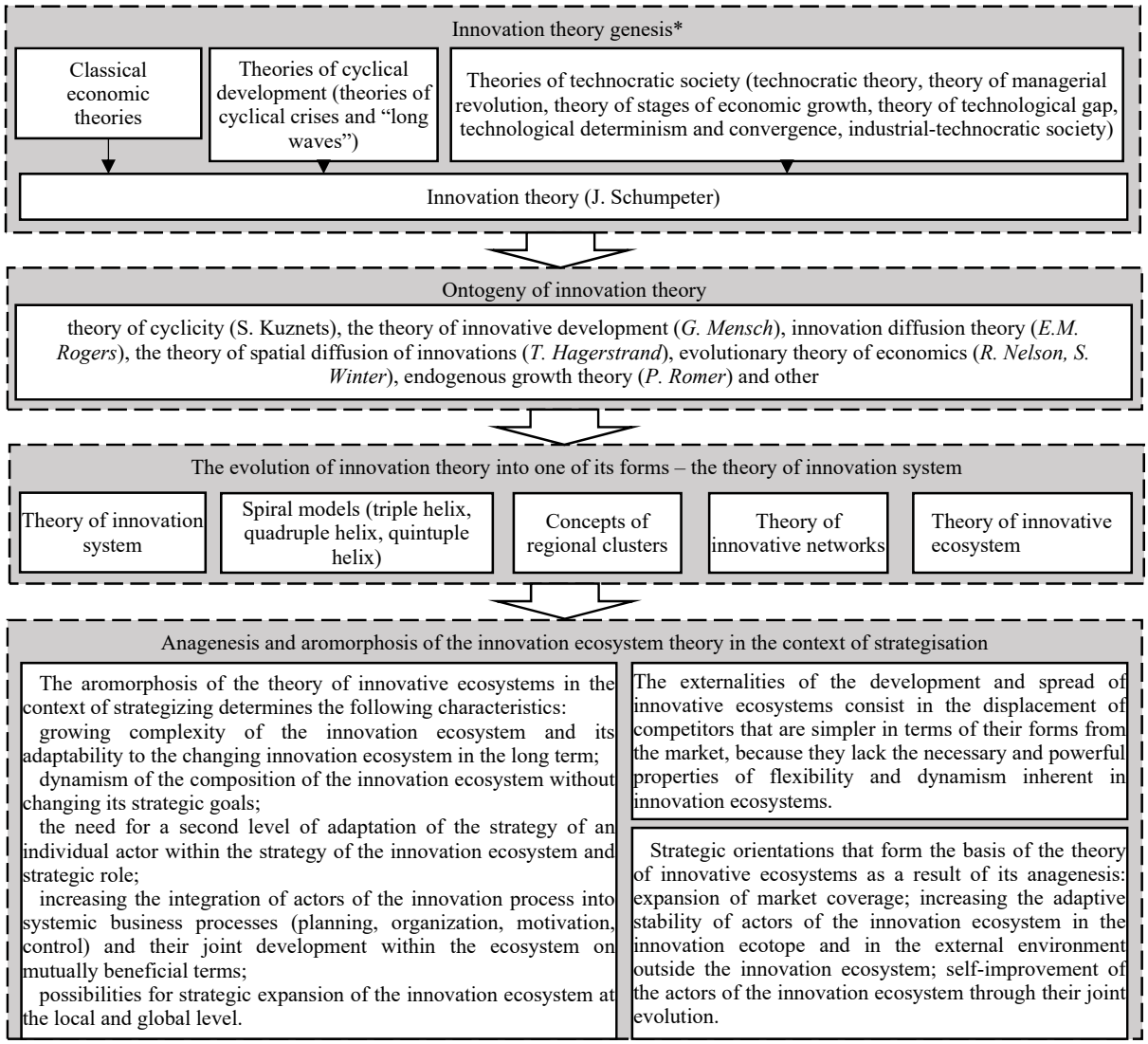

Fig. 2. Genesis, ontogenesis and anagenesis of innovation theory in the context of strategisation

In comparison with the strategic innovation paradigm proposed in the mid-90s of the XX century by Sundbo (1995), which emphasizes market possibilities and considers innovation in terms of the ability to recognize market possibilities and transform them into external and internal business strategies, the modern vision of innovation is broader: innovation is a tool for ensuring strategic goals, countering the decline stage in the life cycle and ensuring competitive advantages.

The method of aligning actors by the central company and ensuring its role in the ecosystem (Adner, 2017) is one of the most well-known approaches to understanding the strategy of the innovation ecosystem.

The scientist determines the competitiveness and strategic positioning of the company on two levels: the competition for profitable positions in the ecosystem and the positioning of the ecosystem as a whole compared to competing ecosystems. However, such a definition remains debatable, and the problem consists of the following:

– the coordination of the internal strategies of ecosystem actors with a common strategic goal (Walrave et al., 2018; Autio & Thomas, 2014; Bosch-Sijtsema & Bosch, 2014; Visscher et al., 2021) and the strategic role of the company in the ecosystem (Adner, 2017; Visscher et al., 2021; Valkokari et al., 2017; Iansiti & Levien, 2004);

– impact on value creation in the innovation ecosystem (Jacobides et al., 2018; Plaksiuk & Pankova, 2024);

– relations with the external environment (Holström et al., 2017).

Certain studies on this matter are available in the scientific literature. Bosch-Sijtsema and Bosch (2014) contrast the company's internal strategy, which refers to internal priorities and business model, defining approaches to value creation and profit generation, to the overall ecosystem strategy. The strategic role of a company in an ecosystem has been defined as critical figures, dominant and niche players (Iansiti & Levien, 2004) or central and connecting companies on a local and global scale (Valkokari et al., 2017). To the greatest extent, this approach corresponds to the vision of Visscher et al. (2021), who indicate that role definition includes strategic positioning at both research and operational levels and alignment processes in each of them.

The analysis of the anagenesis of the theory of innovation and strategic management makes it possible to explain the strategic role of companies in the innovation ecosystem by their contribution to value and substitutability and designation through association with the biological ecosystem. The strategy for the development of the innovation ecosystem should be aimed at achieving the maximum efficiency of the innovation process (the maximum value proposition for the client under the conditions of optimizing the costs of its creation) through the formation of proto-cooperation or mutualism of actors at all levels of the ecosystem pyramid in the long term. At the same time, the developed strategic roles in the positions of commensalism, neutralism or competition require improvement of organizational approaches to ensure the development of an innovative ecosystem through the formation of interest and involvement of actors in the creation of a value proposition on favourable terms.

In general, due to anagenesis, the innovative ecosystem based on strategizing increases adaptive resistance to changes in the external environment. The aromorphosis of an innovative ecosystem within the limits of anagenesis makes it possible to base its theoretical foundation on the properties of adaptation to a changing innovative ecotope in the long term, the dynamism of the composition of the innovation ecosystem without changing its strategic goals, increasing the integration of actors of the innovation process into systemic business processes.

5. Conclusions.

Thus, this research has made it possible to systematise the stages of parallel evolution and anagenesis (common species progressive transformation) of the theory of strategic management and the theory of innovation, which results in an understanding of the current stage of formalisation of the theory of strategisation and the development of the innovation ecosystem.

The corresponding theoretical foundations have been substantiated given the strategic roles of actors in the innovation ecosystem, which are associated with their roles in biological ecosystems. A systematic study of the genesis, ontogenesis of the theory of innovation, and anagenesis of the theory of the innovation ecosystem in the context of strategisation has led to the determination of the characteristics of aromorphosis:

– growing complexity of the innovation ecosystem and its adaptability to the changing innovation ecosystem in the long term;

– dynamism of the composition of the innovation ecosystem without changing its strategic goals;

– the need for a second level of adaptation of the strategy of an individual actor within the strategy of the innovation ecosystem and strategic role;

– increasing the integration of actors in the innovation process into systemic business processes (planning, organization, motivation, control) and their joint development within the ecosystem in mutually beneficial terms;

– the possibilities for strategic expansion of the innovation ecosystem at the local and global levels.

The externalities of the development and spread of innovative ecosystems are outlined, and their strategic orientations are formulated. Further research should substantiate methodical approaches to forming innovative ecosystems from the standpoint of strategic vision.

REFERENCES

Adner, R. (2017). Ecosystem as structure: an actionable construct for strategy. Journal of Management, 43 (1), 39-58. https://doi.org/10.1177/0149206316678451

Ansoff, I. (1965). Corporate Strategy: An Analytic Approach to Business Policy for Growth and Expansion. McGraw Hill.

Autio, E., & Thomas, L.D.W. (2014). Innovation ecosystems: implications for innovation management? In: M. Dodgson, D.M. Gann, & N. Phillips (Eds.), The Oxford Handbook of Innovation Management (pp. 204-228). Oxford University Press.

Bosch-Sijtsema, P., & Bosch, J. (2014). Aligning innovation ecosystem strategies with internal R&D. In: Proceedings IEEE 2014 ICMIT: 7th International Conference on Management of Innovation and Technology. Singapore, September 2014 (pp. 424-430).

Carayannis, E. G., & Campbell, D. F. J. (2010). Triple Helix, Quadruple Helix and Quintuple Helix and how do knowledge, innovation and the environment relate to each other?: A proposed framework for a trans-disciplinary analysis of sustainable development and social ecology. International Journal of Social Ecology and Sustainable Development, 1(1), 41–69. https://doi.org/10.4018/jsesd.2010010105

Carayannis, E.G., & Campbell, D.F.J. (2009). «Mode 3» and «Quadruple Helix»: toward a 21st century fractal innovation ecosystem. International Journal of Technology Management, 46 (3–4), 201-234.

Chandler, A. (1969). Strategy and Structure: Chapters in the History of American Industrial Enterprise. MIT Press.

Chesbrough, H. (2005). Open Innovation: A New Paradigm for Understanding Industrial Innovation. 10th Anniversary Summer Conference on Dynamics of Industry and Innovation: Organizations, Networks and Systems (pp. 1-12).

Dobzhansky, T., Ayala, F. J., Stebbins, G. L., & Valentine, J. W. (1977). Evolution. San Francisco, CA: W. H. Freeman.

Doz, Y.L., & Kosonen, M. (2010). Embedding strategic agility. Long Range Planning, 43, 370-382.

Etzkowitz, H., & Leydesdorff, L. (1995). The Triple Helix: University–Industry–Government Relations: A Laboratory for Knowledge Based Economic Development. EASST Review, 14(1), 14–19.

Farvest. (2022). Global Startup Ecosystem Report. https://www.farvest.com/2022-global-startup-ecosystem-report-shows-6-4-trillion-in-global-startup-economy-value-creation/

Freeman, C. (1995). The National System of Innovation in Historical Perspective. Cambridge Journal of Economica, 19(1), 5-24.

Gebauer, H., Worch, H., & Truffer, B. (2012). Absorptive capacity, learning processes and combinative capabilities as determinants of strategic innovation. European Management Journal, 30(1), 57-73.

Gloor, P. (2006). Swarm creativity: Competitive advantage through collaborative innovation networks. Oxford University Press.

Holström Olsson, H., & Bosch, J. (2017). From ad hoc to strategic ecosystem management: The «three-layer ecosystem strategy model» (TeLESM). Software: Evolution and Process, 29, 1–24.

Iansiti, M., & Levien, R. (2004). Strategy as ecology. Harvard Business Review, 82(3), 68–81.

Ireland, R. D., & Webb, J.W. (2007). Strategic entrepreneurship: Creating competitive advantage through streams of innovation. Business Horizons, 50(1), 49-59.

Ireland, R. D., Hitt, M.A., & Sirmon, D.G. (2003). A model of strategic entrepreneurship: The construct and its dimensions. Journal of Management, 29(6), 963-989.

Ireland, R. D., Hitt, M.A., Camp, S.M., & Sexton, D.L. (2001). Integrating entrepreneurship and strategic management actions to create firm wealth. Academy of Management Executive, 15(1), 49-63.

Jacobides, M.G., Cennamo, C., & Gawer, A. (2018). Towards a theory of ecosystems. Strategic Management Journal, 39(8), 2255-2276.

Lundvall, B.-A. (Edit.) (1992). National Systems of Innovation Towards a Theory of Innovation and Interactive Learning. Pinter Publishers, London.

Markides, C. (1997). Strategic Innovation. Sloan Management Review, 38(1), 9-23.

Mathews, J. A. (2010). Lachmannian Insights into Strategic Entrepreneurship: Resources, Activities and Routines in a Disequilibrium World. Organization Studies, 31(2), 219-245.

Moore, J. (1993). Predators and Prey: A New Ecology of Competition. Harvard Business Review, 71(3), 75-86.

Nag, R., Hambrick, D.C., & Chen, M.-J. (2007). What is strategic management, really? Inductive derivation of a consensus definition of the field. Strategic Management Journal, 28, 935-955.

Nelson, R., & Winter, S. (1982). An Evolutionary Theory of Economic Change. Harvard University Press.

Nonaka, I. (1994). A dynamic theory of organizational knowledge creation. Organization Science, 5(1), 14–37.

Plaksiuk, O., Horvatova, V., & Yakushev, O. (2023a). Human capital as a factor of increasing the efficiency and competetiveness of the company. Academy review. 1(58), 160 – 174. https://doi.org/10.32342/2074-5354-2023-1-58-12

Plaksiuk, O., & Pankova, L. (2024). Capitalization of intellectual potential: Educational and managerial aspect. Academy Review, 1(60), 36–49. https://doi.org/10.32342/2074-5354-2024-1-60-3

Plaksiuk, O., Prodanova, L., Yakusheva, O., Nagaichuk, N., Prikhno, I., & Jakubčinová, M. (2023b). Human capital as a factor of socio-economic development of the state: the main trends of the Slovak Republic. Financial and Credit Activity Problems of Theory and Practice, 5(52), 283–298. https://doi.org/10.55643/fcaptp.5.52.2023.4150

Porter, M. (1998a). Clusters and Competition: New Agendas for Companies, Governments, and Institutions. Harvard Business School Working Paper № 98-080.

Porter, M. (1998b). Clusters and the new economics of competitiveness. Harvard Business Review, 76(6), 77–90.

Porter, M. (1980). Competitive Strategy. Free Press.

Romer, P.M. (1986). Increasing Returns and Long-Run Growth. The Journal of Political Economy, 1002-1037.

Say, J.B. (2001). A treatise on political economy; or The production, distribution, and consumption of wealth. https://socialsciences.mcmaster.ca/econ/ugcm/3ll3/say/treatise.pdf

Schumpeter, J.A. (1934). The Theory of Economic Development: An Inquiry into Profits, Capital, Credit, Interest, and the Business Cycle. Harvard University Press.

Smith, A. (1904). Of the Division of Labour. An Inquiry into the nature and Causes of the Wealth of Nations. Methuen & Co. http://www.econlib.org/library/Smith/smWN1.html

Sundbo, J. (1995). Three paradigms in innovation theory. Science and Public Policy, 6(22), 399–410.

Telnova, H., Kolodiziev, O., Petchenko, M., Yakushev, O., Shulga, N., & Kochetkov, V. (2023). Foreign trade policy and its impact on economic growth. Financial and Credit Activity Problems of Theory and Practice, 4(51), 345–357.

Valkokari, K., Seppänen, M., Mäntylä, M., & Jylhä-Ollila, S. (2017). Orchestrating innovation ecosystems: A qualitative analysis of ecosystem positioning strategies. Technology Innovation Management Review, 7, 12–24.

Veblen, T. (1995). The Theory of the Leisure Class. Penguin.

Visscher, K., Hahn, K., & Konrad, K. (2021). Innovation ecosystem strategies of industrial firms: A multilayered approach to alignment and strategic positioning. Creativity and Innovation Management, 3(30), 619-631.

Walrave, B., Talmar, M., Podoynitsyna, K.S., Georges, A., Romme, L., & Verbong, G.P.J. (2018). A multi-level perspective on innovation ecosystems for path-breaking innovation. Technological Forecasting and Social Change, 136, 103-113.