

## FORMING AN ECOSYSTEM OF INNOVATION

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The paper deals with modern changes in the field of innovations and competitiveness. A controversial nature of an interaction among participants of the innovation process in the form of competition and cooperation is substantiated. The author uses the term "innovation ecosystem" having in mind such forms of cooperation when organizations combine their individual proposals into integrated solutions, ready for use on the consumer market. An innovation ecosystem is usually formed for the development and implementation of innovations. This process involves different players at the market which are the part of the industry supply chain connecting all the production stages, from purchasing raw materials to selling goods to the customers. Within the innovation ecosystem, firms can both compete and cooperate at the same time in solving various tasks. In foreign publications this phenomenon is called "co-opetition". The author has systematized examples of employing the co-opetition strategy by leading foreign enterprises, in particular, on the examples of the Apple Company. The author identifies the main "pillars" of successful innovation activity of a company-leader and represents them graphically.

*Key words:* market agents' interaction, competition and cooperation, competitive environment, co-opetition strategy, marketing research, innovation ecosystem.

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## ФОРМУВАННЯ ЕКОСИСТЕМИ ІННОВАЦІЇ

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Ідентифіковано сучасні зміни, до яких схильні конкуренція і партнерство на ринку інновацій. Аргументовано суперечливу природу взаємодії учасників інноваційного процесу у вигляді конкуренції і співробітництва у конкурентному середовищі. Використано поняття "екосистема інновацій", під яким автор розуміє такі форми співпраці, у рамках яких організації об'єднують свої індивідуальні пропозиції в інтегровані рішення, що готові до використання споживачем на ринку. Для розробки та освоєння інновацій формується екосистема інновації, в яку залучені різні учасники ринку. Систематизовано приклади застосування провідними зарубіжними підприємствами стратегії кооперенції, зокрема, на прикладі компанії Apple. Визначено основні "стовпи" успішної інноваційної діяльності компанії-лідера і подано графічно.

*Ключові слова:* взаємодія ринкових агентів, конкуренція та співробітництво в конкурентному середовищі, стратегія кооперенції, маркетингові дослідження, екосистема інновації.

## ФОРМИРОВАНИЕ ЭКОСИСТЕМЫ ИННОВАЦИИ

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Идентифицированы современные изменения, которым подвержены конкуренция и партнерство на рынке инноваций. Аргументирована противоречивая природа взаимодействия участников инновационного процесса в виде конкуренции и сотрудничества в конкурентной среде. Использовано понятие "экосистема инновации", под которым автор понимает такие формы сотрудничества, в рамках которых организации объединяют свои индивидуальные предложения в интегрированные решения, готовые к использованию потребителем на рынке. Для разработки и освоения инноваций формируется экосистема инновации, в которую привлечены различные участники рынка. Систематизированы примеры применения ведущими зарубежными предприятиями стратегии кооперации, в частности, на примере компании Apple. Определены основные "столпы" успешной инновационной деятельности компании-лидера и представлены графически.

*Ключевые слова:* взаимодействие рыночных агентов, конкуренция и сотрудничество в конкурентной среде, стратегия кооперации, маркетинговые исследования, экосистема инновации.

Rapid growth of complexity and turbulence of business environment, increase of the competition and consumer demands, fast development of informational and communicational technologies are changing the conditions in which enterprises function and require improvement of their management practices. Turbulence in business causes significant changes. Under such conditions, old-fashioned way of doing business becomes out-of-date, and business environment is filled with spontaneity and risks. There is one interesting fact: business environment calls for significant changes in the very process of doing business. This especially relates to continuous process of introducing innovations to business.

These conditions increase the importance of the innovative environment, which, in its turn, becomes the source of management practice development and generates progressive knowledge, first-hand experience and contributes to the adaptation of enterprises to external environment. This is accomplished by providing strategic information, supporting implementation of organizational changes and professional development of management authorities. Hence, on the one hand, external business environment requires choosing optimal forms of co-existence of enterprises in business environment; on the other hand, it requires developing and mastering innovations in order to achieve competitive advantages in the market.

The subject of the present study is contradictory nature of interaction of innovative process participants in competition and cooperation in competitive environment. The aim of the article is the investigation of the essence and constituent parts of the competition in high-tech markets as well as the principles of co-opetition as a form of interaction, investigation of the dynamics of the innovation activities of the enterprises and the concept of cooperation in the market of innovations.

The basis of key competencies has to include the whole value chain – from suppliers to consumers.

Therefore, foreign scholars in their works more and more often treat enterprise as an open system that seeks additional, external means needed for its development and creation of sustainable advantages in competition somewhere outside its boundaries. To be more particular, in this case we are dealing with the following modern concepts of partner integration to innovative activity: leadership platform; integrator's strategy; a model of open innovations; value network; learning organization; hyperlinked organization.

A psychologist G.F. Moor from Harvard University in his book "The Death of Competition" [1] has introduced the notion of "ecosystem of entrepreneurship". In nature ecosystem is a complex group of interdependent living beings (flora, fauna, insects, microorganisms) and non-living elements (ground, water, climate), which are constantly interacting with one another and take advantage of this interaction on a definite territory. By analogy with nature, an ecosystem in market economy is described as complex group of companies, customers, suppliers, competitors and distributors that influence the business of individuals, groups, and partners, and take advantage of that interaction. In the customers' ecosystem market activities (investments, joint product developments, market communications, logistics, and transactions) are performed and controlled not so much by suppliers as by consumers [2].

Developing the theory of G. F. Moor, American scholar Ron Adner [3] introduced the notion "ecosystem of innovation" and explained it as the forms of cooperation, in the framework of which organizations unite their individual offers into integrated decisions, ready to be used by a consumer in the market. The use of information technologies greatly reduces expenditures for communication and coordination of actions, therefore, innovation ecosystems became the foundation of the enterprise growth strategies. Strategies that are

based on ecosystems are implemented in different sectors, such as: polygraphic services for industrial markets, financial services, production of materials, logistics, etc. However, this trend is the strongest in the high-tech markets. Excellent examples of the enterprises following this strategy are such companies as: Intel, Nokia, SAP, and Cisco. Well-established functioning of these companies' ecosystems allowed them to create value that would not be possible to be created by any of these companies on its own, even by the most powerful ones.

Different market participants are functionally connected to each other by information flow through influence and economic consequences for creating demand (directly or indirectly) for goods and services. They form complex network of cooperation and competition. Consumer ecosystem functions in the framework of strictly determined macro marketing environment and can be almost completely modified as a result of the appearance of technological innovation. This was the example of digital technological revolution in the photography, when as a result of tough competition digital picture-taking turned to become a global digital industry with new possibilities of taking pictures, developing and storing them, and the emergence of new competitors that previously existed in the markets of electronics and entertainment (Sony) and computer industry (Hewlett-Packard).

In the ecosystem of innovation there are involved different market participants that are usually members of the chain supply. This regroups all stages of production starting with the purchase of raw materials, their processing, collecting and ending with their selling to the final customer. All these activities are performed in the global traditional and online markets. Graphically the ecosystem of innovations may be represented in the form of interaction between key participants in the global market, as shown in Fig. 1.

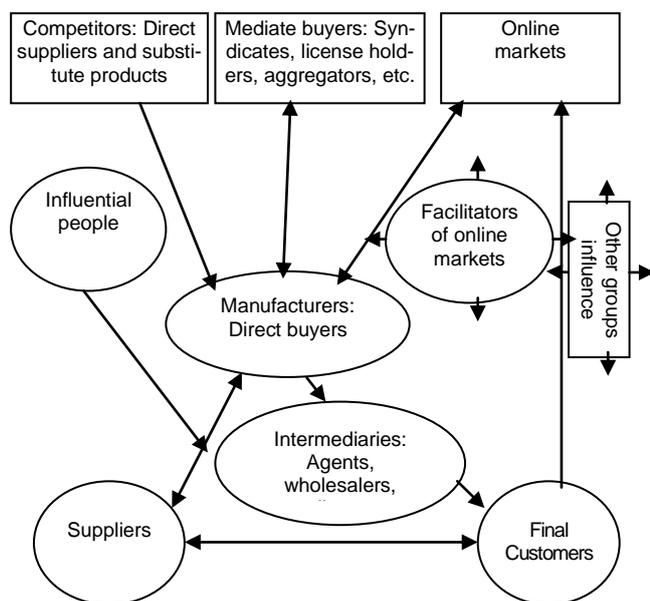


Fig. 1. Key players in the global market and limit innovation ecosystem [2, p. 76]

As it is shown in Fig. 1, the ecosystem of innovations is formed first and foremost of the forces, analyzed in detail by Michael Porter: direct suppliers, producers – direct competitors, final customers, suppliers of the substitute goods. The ecosystem is also greatly influenced by various middlemen: trade, marketing, logistical, financial ones.

In industrial markets it is important to take into consideration possible influence made by so-called influential people, which belong to the category neither of consumers nor users. However, their advice should be always taken into account when making the final decision concerning the purchase of the innovation. These influential people include engineering companies, independent designers, experts, architects, consulting companies, and in pharmaceutical sphere – doctors. In social market economy great influence on business is made by contacting audiences of the innovation ecosystems, such as the mass media, trade unions, organizations for protection of animals, consumer protection organizations, etc.

Facilitators are groups of suppliers in traditional and online markets, which attempt creating the relevant market infrastructure and guarantee the safety of market operations. In the traditional market facilitators are represented by banks, customs offices and tax services. In the online market the role of facilitators is performed by the providers of the Internet and agencies, providing the relevant services via the Internet, including the information middlemen.

Therefore, the business environment under investigation allows us to study all the relations and dual nature of strategies in the relations of enterprises as market participants in the ecosystem of innovations.

Functioning in competitive environment, every enterprise chooses its own competition battle strategy and has to take strategic decisions concerning its conducting in relation to its competitors. Modern competition is more than a "product against product" or "efficiency against inefficiency", it is "non-linear" innovation against "linear" one [4]. Competition battle strategy, or competitive strategy is the totality of interrelated actions, aimed at achieving sustainable competitive advantage in order to secure for an enterprise a beneficial market position, leaving behind its competitors.

Some of the most studied strategies in scholarly literature and the ones that are most widely used in strategic management practices are confrontational strategies. They represent direct competitive battle using a variety of instruments such as: commercial spying, building strategic maps of competitors, matrix of competitive advantages, etc. Other strategies that are quite often mentioned in literature are the strategies of cooperation and mutual agreements between market participants. This is so-called "side-by-side" competing, which has been analyzed in detail by M. Porter in his book "Competitive Strategy" [5].

In order to restrict or avoid direct confrontational contest, enterprises seek other places of differentiation, new positioning, try to attract new clients etc. In mature markets, however, in a long-term period of time, these innovations do not provide significant increase in sales volume. Sometimes there may be observed the phenomenon of "cannibalism", when the products of one group "consume" the products of another group. The scholars Chan Kim and Renee Mouborgne in the book "Blue Ocean Strategy" [6] figuratively refer to the competitive markets as "red oceans" filled with blood of their competitors, ready to destroy one another. In the "red ocean" there are strictly defined market boundaries and principles of the work in sectors are the same for all participants. Products of the competitive companies have similar qualities, and the differences between them quickly disappear as a result of time and benchmarking.

To oppose the existence of "red oceans" Chan Kim and Renee Mouborgne have developed a special "blue ocean strategy". This was the result of the study of over thirty sectors of the economy over the last hundred years. In order to avoid the competition the scholars advocate creating the "blue oceans" – new ideas and markets. The "blue ocean" – does not consist of technological innovations, it is first and foremost the result of successful strategy and careful management decisions. It represents a free niche of the market, which is created by an enterprise. This niche encompasses unsatisfied needs of different groups of customers; focuses on key criteria of making choices and evaluating the product; and is oriented at attracting customers from various markets.

Conducting innovative activity does not only mean confronting other competitors, but it also presupposes cooperation with other market participants, first of all, with consumers, suppliers, middlemen, and other influential groups.

Challenges and possibilities set by the modern market, can be too high to be accomplished by one enterprise on its own. Therefore, the key to success is to transform market partners that are passive market participants into active ones. Let us analyze some of modern examples of cooperation in innovative activity, as illustrated in the book by K. Prahalad and V. Ramaswami [7]. As per initiative of InnoCentive, pharmaceutical company Eli Lilly attracted the skills of more than 8 thousands of scientists to solve the scientific problems, related to different complexity of medicine. Though Lilly is spreading its research and development basis, using the competencies outside the boundaries of the company, it carefully controls all the processes.

Sony created the remote control PlayStation for operating system Linux. Having equipped Linux software with tools necessary to develop PlayStation programs, Sony is coopting competencies of the consumers and spreading the PlayStation as the main platform in the sphere of entertainment. (Contrary to Eli Lilly, which controls the development of its own

products by attracting scientists, who are not employed by the company, Sony attracts consumers directly for the development of its platform).

The positive side of the cooperation is revealed under information and technological revolution conditions. In competitive policies of the globalization era there can be traced interactions between market participants aiming at reaching different types of economic efficiency: allocation efficiency (efficiency of allocating resources in alternative means of their use), production efficiency (optimizing the size of the factory and the company), dynamic efficiency (efficiency of the sector as a constantly developing structure; innovations implementation, which reduces expenses; development of incentives to invest).

This is the way, as American scholar Ron Adner suggests, how an "ecosystem of innovation" is formed. The fact of existence of cooperation, however, does not imply the absence of competition and vice versa. Complexity of the task is that we need to understand each of these terms not only as separate phenomenon, but also treat them as their own opposites [3].

In the attempt to emphasize the peculiarity of the market economy, i. e. the "competition or cooperation" dilemma, scholars A. M. Brandenburger from Harvard University and B. G. Nalebuff from Yale University have developed the theory of "co-competition" or co-opetition [8]. According to these scholars, in business there is no fatal predetermination of success of some companies and failure of others, because many participants can get a certain kind of benefit. In this context, the scholars suggested applying the theory of games, which, in their opinion, will give the possibility for making flexible combinations: change the participants at will, modify values of the business participants, determine the rules and tactics of the game, its framework and scale.

For example, well-known automotive companies follow the co-opetition strategy, flexibly using strong sides of both opposite concepts under different tasks. Hence, Volkswagen is constantly contesting Ford in the attempt to occupy the compact cars market share. On the one hand, fierce competition leads to increase in aggressiveness towards the enterprise's competitors. On the other hand, these enterprises are united in other industrial sectors of the market, for example, in the development of the full-size car models [9].

Alliance as a form of partnership in innovative activity is peculiar mostly to the companies working in the pharmaceutical field. Over the period since 1997 to 2002 more than 20 largest world pharmaceutical companies formed over 1,500 alliances with various biotechnical companies. According to the data published in the "Pharmaceutical Executive" journal and released in May, 2004 by "Strategic Decisions Group", which is a consulting company, 40 – 50 % of products that are in the stage of their development used to be licensed ones and more than a half of total prescription medicine that is best sold is being

developed or is being sold by several companies. As it has been proved by studies, alliances allow companies to reduce up to 15 % of their current expenditures, cut their expenses in developing similar medicine, and increase the research potential in general. Moreover, companies benefit from such forces as capital increase, access to additional credit lines, reducing similar divisions existing in different companies [10].

Co-opetition strategy (which is the combination of cooperation and competition strategies) is used in working with trade middlemen (for example, in the process of new product development and its introduction to the market, in trademark policies, in direct market sales).

The search for new sources of achieving sustainable competitive advantages in competitive markets, first and foremost in dynamic, high-tech sectors of the economy, requires from the enterprises persistent development and mastering technological innovations and introducing to the market product innovations. Fig. 2 represents four main directions of achieving competitive advantage (according to J. Rearse and R. Robinson "Building Blocks of Competitive Advantage"), among which there should be mentioned: high quality, high efficiency, high level of service provision and innovation.

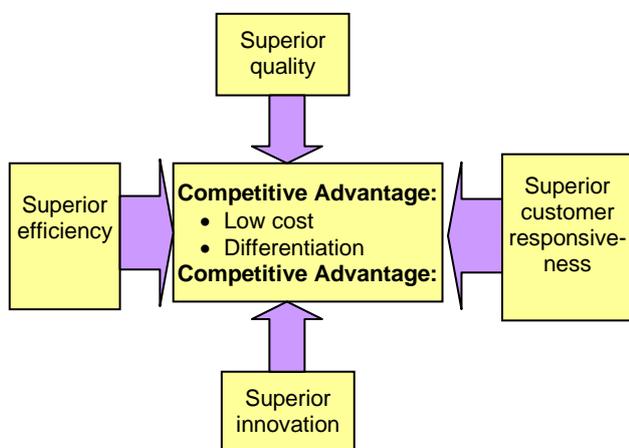


Fig. 2. Building Blocks of Competitive Advantage [10, p. 83]

The first three directions usually provide the possibility for achieving one of the two types of competitive advantages: low expenses or differentiation. For example, high efficiency gives an organization the possibility to lower its expenses, on the contrary, high quality of the product or high level of service provided for clients, determine increase in the expenditures and higher prices of the product. In case of innovations one can expect either decrease in the expenses (when implementing technological innovations) or achieving uniqueness of the product (when introducing innovation to the market). There have been reported cases when innovation provided leadership in expenses and

simultaneously for a definite period of time guaranteed uniqueness of the product.

Nevertheless, nowadays single and nonsystematic introduction of innovations to the market does not guarantee the company permanent leadership position in this market. Enterprises leading in the market of innovations are not only managing the development of the products and introducing them to the market, but they also have this process on the conveyor. Therefore, instead of dealing with single innovation management, we speak about "the flow of innovations". One of the most vivid examples of this approach is the experience of Apple and leaving behind oil and gas company Exxon Mobil [11]. Thorough study of the experience of Apple company made it possible to identify the main "pillars" of successful innovation activity of a company-leader and represent them graphically in Fig. 3.

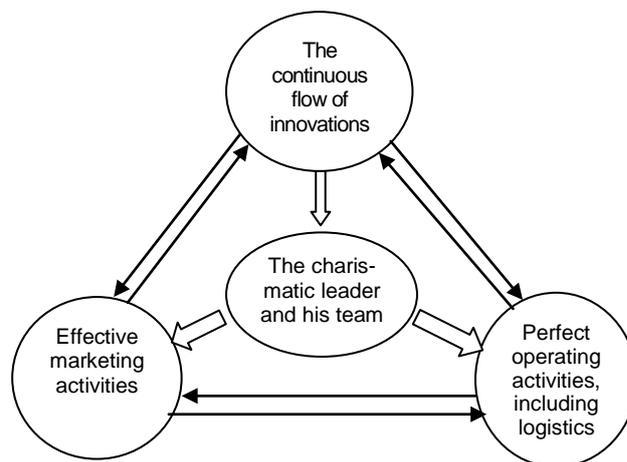


Fig. 3. "Pillars" of the company's success in the ecosystem of innovation Source: author's creation

Being headed until recently by Steve Jobs, one of co-founders of the Apple company and its CEO (Steve Jobs passed away in October, 2011), Apple over the past decade introduced to the market the whole range of products, from MacBook and iPod to iPhone and iPad, and by 12 times increased its sales volume. Not only did Apple manage to create new electronic products, but by establishing the standards of quality in the market of computer industry it also contributed to formation of markets of new products like iPod, iPhone and iPad.

One of the conditions that contributed to the success of the company was its impeccable operational activity, including effective logistics. Apple's Chief Operating Officer and top logistician of the company was Timothy Cook – a professional in the sphere of operating activity, "a genius in logistics and organization", "an ideal operating officer" (Forbes, 2011) [12], who is now CEO of the company.

A team of professionals, headed by these top managers, modified the logistics of the computer

assembly and built a system, which, according to general recognition, is one of the principle competitive advantages of Apple.

They managed to establish highly efficient production chain, which is the world's best sample in the market of electronics. Production expenses were minimized: factories and warehouses all over the world were closed and their functions were delegated to other companies for outsourcing [13]. The second step in improving operating activity of the company was the development of the distribution network. Currently Apple has over 300 Apple Stores and thousands of specialized resellers all over the world – none of Apple's competitors can boast of having such advantage.

Though, we consider one of the strongest sides of Apple to be effective marketing of innovations. Not only was Steve Jobs a successful manager and strategic ideologist of the company, but he also established himself as a talented marketing manager and a wonderful orator. In the market of innovations it is not enough simply to develop the revolutionary product, it is also important to make it commercial. Moreover, the customer must be convinced in usefulness of a new product. Not all companies, even the most experienced ones, can accomplish that. This can be proved by the example of the competition battle between Microsoft and Apple.

Over the last five years there was a confrontation of the product Zune by Microsoft and iPod by Apple. Recently Microsoft announced the termination of the development and production of multimedia players Zune. On the official website of the company one can read [11]: "We are discontinuing the production of the players Zune". This has raised a lot of criticism addressed to Microsoft. Actually, the product Zune had chances to become successful. The first samples of the product have been released in 2006 and were supposed to be serious competitors to iPod. According to professionals, the player possesses several interesting functions, such as: radio and Wi-Fi synchronization with Zune Pass. However, the management of the company, having introduced the competitive product to the market, obviously, thought that it was sufficient to do so and did not engage in promoting it as actively as Apple promoted an iPod. Apple also overcame its competitor in the sphere of marketing decisions, redesign and upgrades. There is no wonder that Microsoft failed to attract the users of an iPod, which last year constituted 77 % of the American market.

Effective innovative and marketing activity of Apple have resulted in strengthening of its positions in the market and benefited its financial situation, which can be proved by the following.

First of all, at the beginning of August 2011 Apple became the most expensive company in the world, having reached the capital of \$ 338 billion leaving behind oil and gas company Exxon Mobil [14].

Secondly, according to estimations of international brand consulting agency Interbrand, which published the rating of the best brands 2011 – "Best Global Brands 2011", Apple brand occupies the eighth place in the world. Formerly, this place belonged to Nokia, which this year holds only 14th position [12].

According to Gartner data, in the first quarter of 2011 there were sold 427,8 millions of the cell phones in the world; over the year the market has increased by 19 %. However, the leaders in this market – Nokia, LG, Motorola and Sony Ericsson have all decreased their indicators. At the same time, Apple increased the sales volume – over the year the sales volume of the smartphone iPhone have actually doubled – reaching from 8,3 to 16,9 million items.

It is professional competency of the employees and the work in team headed by S. Jobs and T. Cook as well as effective marketing programs that made Apple products not only of the highest quality, but also made them the most profitable ones. Company possesses significant amount of available funds: its funds estimated over \$75 billion [11].

In order to achieve success and sustainable competitive advantages in the market, enterprises have to develop and introduce innovations to the market. Modern market is a complex system of relations between companies, buyers, suppliers, competitors, and distributors that influence the business of individuals and groups, as well as partners that benefit from one another. In the ecosystem of innovations market activity (investments, joint product development, market communication, logistics, and transactions) are performed and controlled not so much by suppliers as by consumers. In order to develop and understand innovations an ecosystem of innovation is formed. It engages different market participants that are usually part of the economy sector supply chain incorporating all stages of production starting with the purchase of raw materials, their processing, collecting and ending with their selling to the final customer. Enterprises in the ecosystem while pursuing their own goals, can compete and cooperate at the same time, and this phenomenon has been described in the foreign literature as "co-opetition".

Nevertheless, modern competitive environment requires from entrepreneurs mastering new approaches to competing in the market. One of the possibilities is to create new market space in order to avoid face-to-face competition and establish constructive relations with competitors, which would contribute to increase in efficiency of functioning in the market through implementation of effective innovative projects and programs. In this case we speak about alternative approaches to changing the competitors' behaviour, which can be revealed in dual character of competition strategy. Implementation of the co-opetition strategy, i.e. cooperation with competitors simultaneously contesting with them (for example, in different functional spheres, market sectors, in different countries) gives the companies the

possibility to flexibly use strengths of the opposite competitive concepts while solving various tasks.

Efficiency of the innovation processes of enterprises can greatly increase on condition of cooperation and partnership with other market participants, first of all, with suppliers, middlemen, users, especially at the early stages of innovation implementation. Therefore, tracing successful examples of cooperation in Ukrainian market of innovations and thorough investigation of methods and techniques used in this process, will be the subject of our further studies.

In functioning of the ecosystem there rises the issue of synchronizing the efforts of its main participants that are involved in the process of creating and introducing the innovation to the market. The mechanism coordinating the efforts of all ecosystem participants as well as the problem which organization in particular has to assume the role of the coordinator, have not been much researched in literature on innovation issues. This will also be the subject of our further studies, particularly in the framework of research carried out by the staff of the Department of Organizational Management of Lviv Polytechnic National University in correspondence with the government-funded theme DB/LANTS (ukr. ДБ/ЛАНЦ) "Innovative Enterprise Management Processes in Value Chains".

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