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# THEORY AND RESULTS – USER-DRIVEN INNOVATION

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## ABSTRACT

*Purpose* – of the study is to determine whether a user-driven innovation (IUP) system is more effective in introducing innovation than a linear one.

*Methodology* – the study was conducted using such methods as: abstract - logical and comparative analysis, the method of description and generalization. The sources of research were theoretical and analytical articles, the works of Kazakhstan and foreign authors, which examine user-driven issues of the innovation system.

*Originality/value* – the authors formulated the following hypothesis: companies implementing IUP systems represent a higher level of innovation than companies introducing a linear process. The following methods were used: questionnaire, standardized interview and ranking method. The hypothesis was tested.

*Findings* – to achieve this goal, appropriate research methods were applied. The first stage of the research was the identification of innovation processes by an expert group. Subsequently, the results of a qualitative study were verified by a quantitative survey conducted by the method of standardized interview. The study showed a relatively small role of the board in relation to customers in the innovation processes at the surveyed enterprises. Achieving sustainable change remains a fundamental challenge.

*Key words* – innovation; user driven innovations; user-driven innovation process.

## INTRODUCTION

Innovation is a key factor in economic growth, and innovation processes are becoming more complex; since the mid-1950s, when they were described linearly, through related processes, to the most recent: open and diffuse innovations. One of the newest concepts originated in the 21st century is the innovation process, user-driven innovation (UDI). The concept of UDI, which began to take shape in 2005, is based on the belief that consumers (users) are increasingly influencing the commercial offer. Indeed, they are involved in the process of creating the products and services they buy. UDI can be defined as the process of using user knowledge to develop new products, services, and concepts that are based on a genuine understanding of user needs and the systematic involvement of users in an enterprise development process. The problem of research in this work is the innovation of UDI in enterprises. The purpose of the study is to determine whether the UDI system is more effective in introducing innovations than the linear one. The following hypothesis was formulated: companies introducing UDI systems (processes) represent a higher level of innovation than companies introducing innovations based on a linear process. To achieve this goal, appropriate research methods were applied. The first stage of the research was the identification of innovation processes by an expert group. Subsequently, the results of a qualitative study were verified by a quantitative survey conducted by the method of standardized interview.

It should be noted that in the context of the deepening process of globalization and the rapid development of the media, UDI processes have enormous potential for creating innovations. However, it should be emphasized that in this case the theory is lagging behind practice, therefore, these processes are still not well understood. The research results should contribute to the enrichment of the theory of innovation, and can also be applied in economic practice as important information (invitation) for entrepreneurs.

## LITERARY REVIEW

Innovations are perceived as the main driver of economic growth. The term “innovation” is derived from the Latin and means the introduction of something new, newness, reform - based on innovation, which means “update” [1]. Therefore, innovation issues have been discussed in many publications.

The most important publications include the publications of J. A. Schumpeter, who is considered the father of the theory of innovation, as well as his outstanding work “The Theory of Economic Growth” [2]. F. P. Drucker [3], Eurostat and the European Commission [4].

At the beginning of the XX century, according to N.I. Lapin, the term "innovation" was perceived by economics: in 1909 Werner Sombart in a large article "Capitalist Entrepreneur" substantiated the concept of the entrepreneur as an innovator. The scientist concluded: the main function of the entrepreneur is to bring technical innovations to the market for the sake of making profit and strive to spread this new one as widely as possible.

The concept of "innovation", concludes N.V. Miroshnichenko, acquires a broader meaning as the development of the modern economy - an economy based on knowledge. The category of "innovation" is increasingly extending to organizational methods and methods associated with the use of various elements that contribute to the development of the enterprise. The author identifies several aspects of innovation as an economic category: innovation as an idea; innovation as a change in the socio-economic potential of the enterprise; innovation as an investment in innovation and research; innovation as an intellectual product in the form of a new product or service, the object of intellectual property; innovation as a new form of organization of production, labor, service, management; innovation as an act of introduction of any innovation; innovation as a result of the use of new ideas; innovation as a process of improving something.

Modern economic research that the use of accumulated knowledge and products and technologies created on this basis has required the development of a system for collecting and analyzing data on innovations. The most important system document for solving this problem are Recommendations on the collection and analysis of data on innovations (Oslo Manual, 3rd ed.) [5].

This document states: “The expression“ knowledge-based economy ”is intended to emphasize the movement of developed countries to greater reliance on knowledge, information and high qualifications, as well as the growing need for direct access to all this from the government and business” (paragraph 71 Chapter 2 "The Theory of Innovation and the Need for Measurements"). Paragraph 72 states that the study of innovation processes and political discussions have shown the importance of studying innovations from

a broad perspective and that innovations can be found not only in manufacturing enterprises, but also in the service sector. According to the OECD nomenclature, innovation can be associated with a product, process, organization, or marketing.

The first and second editions of the Oslo Manual contained a definition of technological innovation - product and process. In the third edition, the definition of innovation is expanded to include two additional types of innovations - organizational and marketing. The Oslo Manual contains numerous references to the norms set forth in the Frascati Manual [6].

Manual Frascati was first released in 1963 and was the first document on the statistics of science and innovation [6]. This manual was developed and is constantly being supplemented by experts within the framework of the Organization for Economic Cooperation and Development (OECD) for systems analysis of innovations in market conditions. The latest edition of the Guidelines was adopted in 1993 and became the main international standard.

The preface to the Russian edition of the Oslo Manual (2010) states: “The country is today at the beginning of the path of building a modern innovative economy. Although much has already been done, much more is to come. The difficulty and novelty of this path for Russia gives rise to a lot of methodological problems that need to be solved, and questions that need to be answered. It is quite natural that there is a diversity of opinions not only on the paths to the goal set, but also on the basic concepts and content of the process. The discussion of concepts, lack of consistency in formulations give rise to uncertainty and vagueness in actions, which, in turn, leads to a dispersion of the forces of creation and their burden in opposite directions ”[7].

The concept of "innovation" is quite complex and multifaceted. Despite the large number of studies on the theory of innovation, in science there is no generally accepted definition of this concept. The development of various aspects of the theory of innovation was done by J. Schumpeter, B. Twiss, G. Mensch, VG Medynsky, L.S. Blyakhman, N.D. Kondratiev, A.I. Prigogine, S.Yu. Glazyev, Yu.V. Yakovets, K. Freeman, E.G. Yakovenko, B. Santo, F. Valenta, E. Rogers, E.A. Utkin, R.A. Fatkhutdinov and other scientists. To clarify the essence of innovation, it is necessary to consider the views presented in the scientific literature about the definition of this concept. There are several main approaches in which innovation is viewed as:

− change (J. Schumpeter, LS Blyakhman, Yu.V. Yakovets, F. Valenta);
− process (B. Twiss, S.Yu. Glazyev);
− the result (R.A. Fatkhudinov, I.N. Molchanov, E.A. Utkin) [8].

Table 1 – Innovation processes

| № | Processes | Characteristic |
|---|---|---|
| 1 | Push science | A linear model of the innovation process promoted by science |
| 2 | Put on the market | A linear model of the market-driven innovation process |
| 3 | Conjugated | Models of interaction in which the links between the individual elements are the result of the links between science, the market and the enterprise |
| 4 | Integrated and network | Integrated systems based on network connections-flexible, based on customer-related response system, continuous innovation |
| 5 | Information and communication technologies | A set of interrelated elements designed for data processing using computer technology. As innovative systems develop, the role of information and communication technologies increases |
| 6 | Self-learning processes (systems) | Focus on knowledge management and learning through a set of electronic tools to facilitate ongoing information transfer and decision-making |
| 7 | Open innovation | The concept is based on the belief that companies can and should even look for ideas and ways to create innovations not only in their structures, but also in their environment - among external partners (companies, organizations and customers) |
| 8 | User-driven innovation (UDI) | Based on the belief that consumers (users) have an increasing influence on the available commercial offers by participating in the process of creating the products and services they buy |
| 9 | Diffuse the innovation process | Focus on open innovation within and outside the organization. Innovation is created (higher value is generated) by creating an effective knowledge sharing system (inside and outside) |
| Note: Compiled from source [10] | | |

However, there have been few studies on innovation in services. Much attention in the literature. These issues were also considered economical, such as P. K. Ahmed, R. Rorhwell, P. McGowan, S. J. Kline and N. Rosenberg, G. Roehrich and R. Cooper [9]. Table 1 shows the different approaches to innovation processes.

The UDI process is one of nine processes (also called systems) that can be distinguished in the literature on the theory of innovation [11]. Initially, innovation processes were perceived as a simple consequence of changes (market needs or research results) - points 1 and 2 of table 1. They can be called linear. However, S. J. Klein and N. Rosenberg [12] noted that these processes can be more complex, and developed a model of a conjugate innovation process. Later studies were much more complex and all of them, starting from the 1990s (point 5 in table 1), were used advanced computer technology. The concept of open innovation [13] laid the foundation for a new view on innovation processes [14, 15]. This allowed ideas to go beyond the organization and be open in the process of creating innovations - this turned out to be a factor that greatly stimulated innovation. Another idea is a network innovation company. On this basis, the UDI concept was created.

The active participation of customers, even in the joint creation of innovations (new products and services), seems to be the best option both for customers who, in the process of creation, notify their needs and ideas, and for entrepreneurs who seek to satisfy these needs, as this increases their confidence in sales. In the light of research conducted in Sweden, UDI helps develop proactive technologies that meet the needs and demands of modern citizens. Researchers show that the concept of co-creation by customers is applicable not only to the creation of innovations, but can also be used, for example, to improve the quality of services [9]. It should be noted that the current change is the transition from technological innovation to innovation, which is carried out by customers and other actors outside the enterprise. This development continued until today, starting from the first stage, covering the 1950s and the first half of the 1960s, when innovative processes developed linearly, through more complex systems, to the modern process, which began after 2000 and is characterized by a greater emphasis on knowledge management [16]. Figure 1 shows the UDI process, based on the literature review shown above.

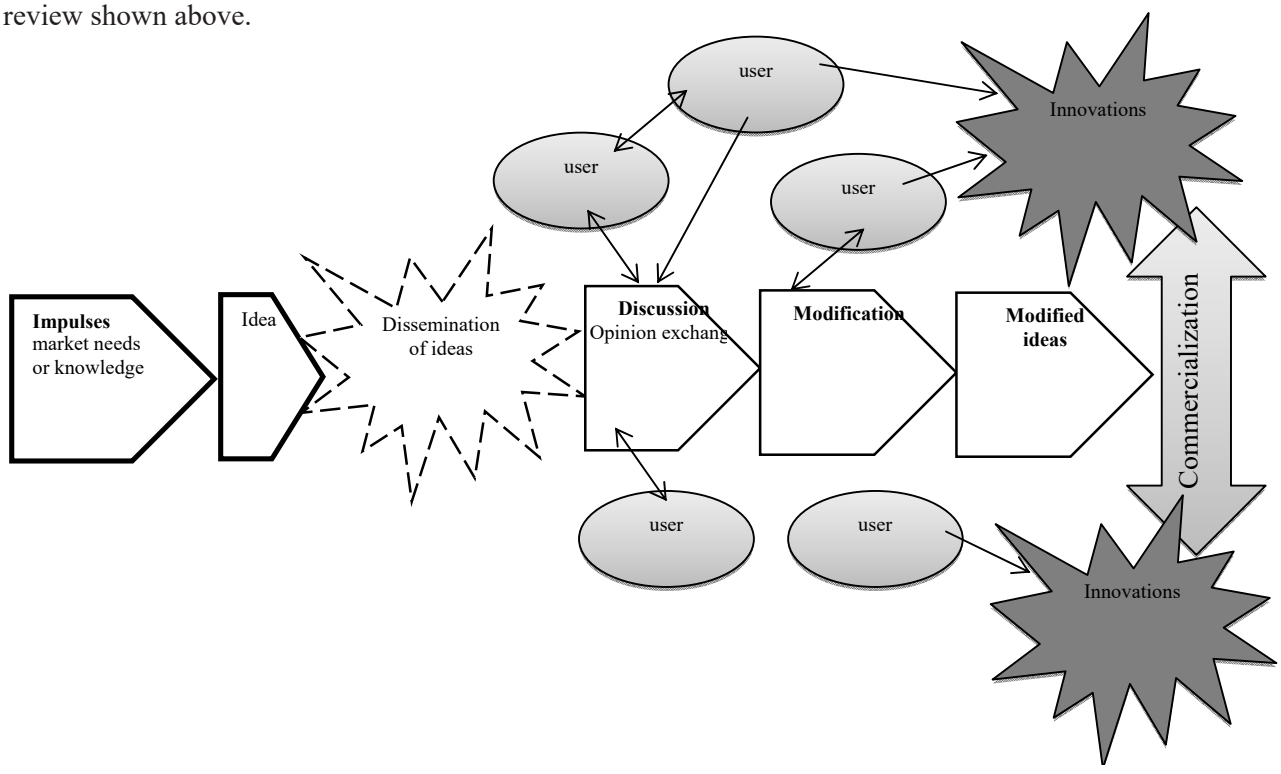


Figure 1 – User-driven innovation process [16]

The IEP process is open in nature and is based on users (future customers). The process is initiated by the impulse emanating from the needs of the market or knowledge. The next step is to create an idea of innovation. The idea should be distributed to future users. The main part of the process is a discussion. The idea is modified

during the discussion, which allows to better meet the needs of customers. The author shows two innovations as a result of the process. The end result (innovation) should not complete the process but should be the beginning of a new idea.

## METHODS

The research task was implemented using the Delphi method, which allowed systematizing knowledge and formulating recommendations. Delphi is a qualitative method that combines the knowledge and opinions of experts to achieve a conscious consensus on a complex problem, which is a structured process of group communication, designed to ensure the effectiveness of the actions of a community of independent individuals committed to solving a complex problem. There are many varieties of the Delphi method in the literature [16, 17, 18]. In later studies, the classical method was used.

The article presents the results of two rounds of the survey using the Delphi method, which were conducted during the summer season of 2017 in two rounds using the CAVI (electronic) questionnaire. The study involved 12 experts, scientists and practitioners specializing in innovation and economics in tourism. The survey allowed to check and correct the questionnaire prepared using the CAVI method.

The next stage was a marketing study of providers of tourist services, since it seems that this group of suppliers should be most interested in the comments and suggestions of customers (persons using tourist services). To study the current situation of the tourism industry was determined entertainment and business tourism, health tourism, sports and children's tourism Schuchinsko-Borovskoy resort area (SCHBKZ).

To assess the current situation of SCHBKZ in the tourism industry, we use one of the modern methods of strategic portfolio analysis of the industry - the ADL / LC matrix (ADL is the abbreviation of the name of the company Artur D. Little, LC is the abbreviation of Life Cycle). Currently, 159 enterprises have been registered in the tourist services sector of SCHBKZ.

This method considers the activities of individual business units from the standpoint of the concept of the industry life cycle, in accordance with which each firm goes through four stages in its development: origin, development, maturity and decline. In each of these stages, the firm may occupy a different position in the market: leading (dominant), strong (favorable), strong, weak.

Three methods were used to collect data: CAWI, PAPI and telephone interview. Such tools: a paper and pencil interview (PAPI) questionnaire, which they filled out during the interview, and a CAWI questionnaire, which they filled out after the conversation. Only 41 respondents indicated the introduction of innovations with the active participation of service users (customers). Given such a small sample size, it should be recognized that the study was of a qualitative nature. Technique of design, consisting in online distribution of electronic survey questionnaires, proved ineffective.

## RESULTS AND DISCUSSION

According to the results of the study of the enterprises of the tourism industry SCHBKZ, ADL / LC matrices were constructed for entertainment and business tourism, health tourism, sports and children's tourism (Table 2).

As can be seen from this table, entertainment and business tourism, 123 accommodation facilities out of 159, and 48% in terms of the number of available places, are the most widely used at the school. The second type of popularity is developing sports and children's tourism - 35% of the seats provided, closes the top three - medical and health tourism - 17% of the places.

These shares with a similar trend are projected on all market positions. Thus, one leading enterprise was singled out for all types of tourism, entertainment and business tourism in terms of the number of places provided occupies the largest share - 3.3%, 2.5% - sports and children's tourism, 1.4% - medical and health tourism.

A strong position in the market of entertainment and business tourism is occupied by 9 objects with a share of 8.2% of the seats provided, 3 enterprises each represent sports and children, as well as medical tourism with a share of the supply of 5.5 and 4.1%, respectively.

Table 2 – Structural shares of individual types of SCHBKZ tourism according to the ADL / LC matrix

| Type of tourism | Amount | Competitive position of business | | | |
|---|---|---|---|---|---|
| | | Leading | Strong | Durable | Weak |
| SCHBKZ as a whole, including | Subjects | 3 | 15 | 38 | 103 |
| | Places | 873 | 2152 | 2950 | 6129 |
| Entertainment and business tourism | Subjects | 1 | 9 | 31 | 82 |
| | Places | 400 | 990 | 1100 | 3369 |
| | Share in industry by number of places,% | 3,3 | 8,2 | 9,1 | 27,8 |
| | Market position share,% | 6,8 | 16,9 | 18,8 | 57,5 |
| Sports and children tourism | Subjects | 1 | 3 | 4 | 10 |
| | Places | 300 | 667 | 1300 | 1930 |
| | Share in industry by number of places,% | 2,5 | 5,5 | 10,7 | 15,9 |
| | Market position share,% | 8,4 | 24,2 | 26,9 | 40,5 |
| Medical-health tourism | Subjects | 1 | 3 | 3 | 11 |
| | Places | 173 | 495 | 550 | 830 |
| | Share in industry by number of places,% | 1,4 | 4,1 | 4,5 | 6,9 |
| | Market position share,% | 7,1 | 15,9 | 31,0 | 46,0 |
| Note: compiled by authors based on primary data | | | | | |

31 enterprises of entertaining and business tourism have been identified that hold a strong position in the market. This is 9.1% of proposed accommodation. This position is characterized by 4 enterprises of sports and children, and 3 medical tourism facilities, which is 10.7% and 4.5% of all offered places, respectively.

Finally, a weak position in the entertainment and business tourism market is characterized by 82 enterprises with a share of 27.8% of all places provided, 10 sports, children's enterprises and 11 objects of health-improving tourism also occupy a weak position with a supply share of 15.9 and 6, 9% respectively.

The prevalence of enterprises with a weak position in the market for each type of tourism is also indicated by the internal offer of places provided. This is 57.5% of the places of entertainment and business tourism, 40.5% and 46% of sports, children's and health tourism, respectively. Whereas the total share of places provided by enterprises with a leading and strong position is 11.5%, 8% and 5.5% of entertainment and business tourism, sports, children and health tourism, respectively.

We considered above that the share in the tourism industry in terms of the number of places is health tourism (17% of the places), i.e. 18 objects from 159 objects SCHBKZ.

Healthcare tourism providers were able to choose two of the nine options, representing examples of innovative process models. 18 respondents UDI was listed as one of the two models or the only model.

Of the 18 organizations stated that they are implementing an UDI process. The results of the study showed a higher innovativeness of subjects using UDI processes.

The average level of innovation of the studied layer of 18 objects amounted to 3 innovations. The structure of innovation should be compared. During the study, they were divided into two categories - type and range. In accordance with the types of innovations, four main groups were identified: groups related to the product, marketing, process and organization, as well as institutional and social groups. In turn, the significance of innovation is determined by its range. Thus, it is possible to identify innovations in the activities of companies at the levels of the region and the state.

Table 3 – The structure of the matrix ADL / LC medical-health tourism SCHBKZ

| Стадии жизненного цикла | Competitive position of business | | | |
|---|---|---|---|---|
| | Leading (dominant) | Strong (favorable) | Durable | Weak |
| | | | | |
| Origin | | 1 (Medical and health complex "Terrassa Park") | | |
| Development | | | | |
| Maturity | 1 (Medical complex "Ok Zhetpes") | 1 (Republican Rehabilitation Center "Karagay") | 1 (Sanatorium "Almaz") | 4 ("Samal", "AK-Bulak", "Discovery", "Zhumbaktas") |
| Recession | | 1 (Republican Rehabilitation Center "Burabai") | 2 (Sanatorium "Zeleni Bor", Sanatorium "Shchuchinsky") | 7 (Zheke-Batyr, Bura, sanatorium for children "Burabai", dispensary named after S.Seifullin, "Maybalik", etc.) |
| Number of seats | 173 | 495 | 550 | 830 |
| Average load | 65% | 40-50% | 30-40% | 25-30% |
| Seasonality | Year-round | | | |
| Note: compiled by authors based on primary data | | | | |

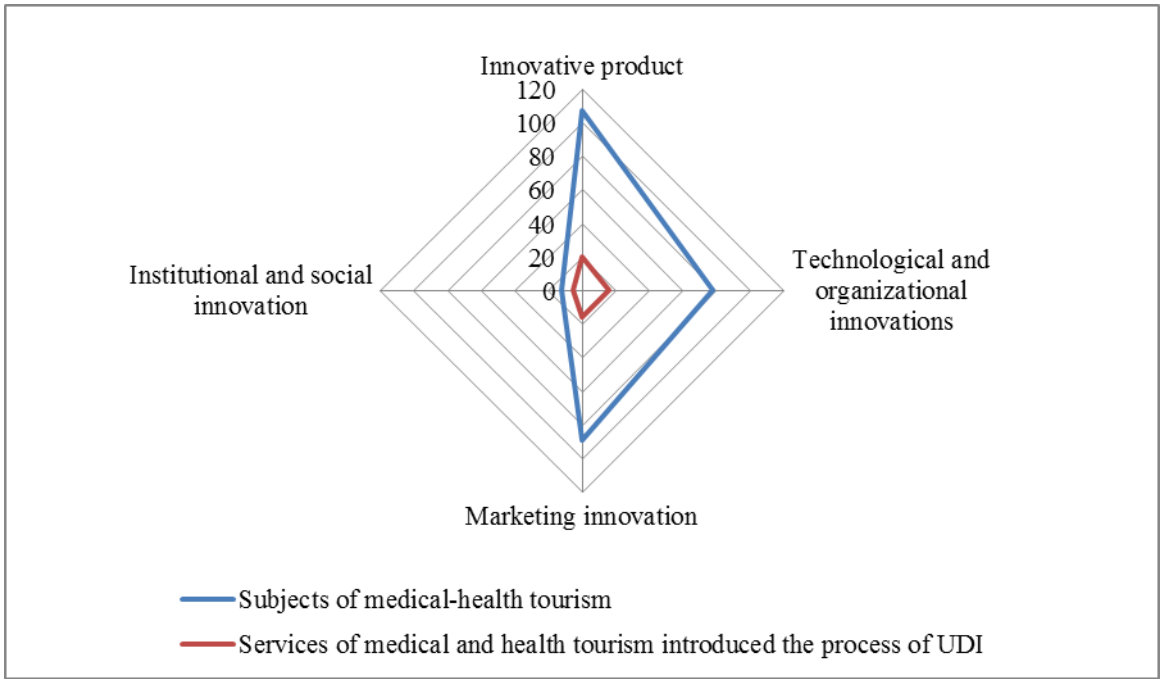


Figure 2 – Comparison of types of innovations introduced by organizations implementing UDI processes with other respondents (%)

Figure 2 shows the clear difference between health care tourism service providers and organizations that use the UDI model in the innovation process. The latter are much more innovative in each category of innovation.

The largest almost fourfold difference lies in innovative products.

**CONCLUSION**

Based on the conducted research, it can be stated that the goal set in the introduction has been achieved.

This study allows us to formulate the following theoretical conclusions, which can make a definite contribution to the theory of innovation management:

− Organizations using the IUP model in the innovation process work much better in terms of the number and importance of innovations, introducing almost three times more innovations than the average health care tourism provider SCHBKZ. This allowed for a positive test of the hypothesis.

− Most of the innovations presented in the product range.

Based on the results of the study, we can draw the following conclusions about the implementation:

− In order to improve innovation, an open process is recommended, in particular with user engagement.

− This is especially important when introducing product innovations, where the voice of users is extremely important in the process of developing an innovation concept.

The study of innovative processes of IUP should be extended so that the subjects can use the model in practice, using other, less advanced models.

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**Резюме**

Проблема исследования, обсуждаемая в статье, – инновационный процесс, называемый инновации, управляемые пользователем (User-Driven Innovation (UDI). Цель исследования – определить, является ли система ИУП более эффективной при внедрении инноваций, чем линейная. Анализируются различные подходы ведущих ученых к пониманию сущности инноваций и теории возникновения инновации. Сформулирована следующая гипотеза: компании, внедряющие системы ИУП, представляют более высокий уровень инновационности, чем компании, внедряющие линейный процесс. Использовались следующие методы: анкетирование, стандартизированное интервью и метод ранжирования. Гипотеза была проверена. Исследование показало относительно небольшую роль правления по отношению к заказчикам в инновационных процессах на обследованных предприятиях.

**Түйін**

Мақалада талқыланатын зерттеу мәселесі–пайдаланушы басқаратын инновациялар (User-Driven Innovation (UDI) деп аталатын инновациялық процесс. Зерттеудің мақсаты – ПБИ жүйесі желіден гөрі инновацияларды енгізу кезінде неғұрлым тиімді болып табылатынын анықтау. Инновацияның мәнін және инновацияның пайда болу теориясын түсінуге жетекші ғалымдардың түрлі тәсілдері талданады. Келесі гипотеза тұжырымдалды: ПБИ жүйесін енгізетін компаниялар желілік процесті енгізетін компанияларға қарағанда инновациялылықтың жоғары деңгейін ұсынады. Келесі әдістер қолданылды: сауалнама, стандартталған сұхбат және саралау әдісі. Гипотеза тексерілді. Зерттеу тексерілген кәсіпорындардағы инновациялық үдерістердегі тапсырыс берушілерге қатысты басқарманың салыстырмалы түрде аздаған рөлін көрсетті.