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THE STATISTICAL RESEARCH OF PROBLEMS OF INFORMATION SUPPORT FOR INNOVATIVE ACTIVITY OF ENTERPRISES IN KAZAKHSTAN

[1]UTEPBERGENOV I.T., [2]BAIZYLDAYEVA U.B., [3]BURANBAEVA A.I., [4]TOIBAYEVA SH.D.

[1,2,3,4]Institute of Information and Computational Technologies CS MES of RK, Kazakhstan,
[1,4]University Turan, Kazakhstan,
[2]KIMEP University, Kazakhstan,
[1,4]al-Farabi Kazakh National University, Kazakhstan
E-mail: [1]i.utepbergenov@gmail.com, [2]bdana22@kimep.kz, [3]Aburanbaeva@gmail.com,
[4]shara_t@mail.ru

ABSTRACT

In this research paper the actuality and importance of the provision of business with up-to-date innovations achievements are considered with comparative analysis of the existing innovations news and observations sources. For the beginning of the research of innovative activity of Kazakhstani enterprises we decided to investigate the state of things with innovation with questionnaire method as a productive way to research current statements of business environment. In the paper the general approach to the analysis of survey results is set with some overall conclusions for further detailed analysis. This paper is to serve as our start point to understanding and analysis of innovative activity of Kazakhstani enterprises. This research will be continued for further clarification, analysis and development of useful instruments to support innovative activities of Kazakhstani enterprises

Keywords: *Innovation Management, Information Support, Descriptive Statistics, Regression Analysis, Visualized Analysis, IBM SPSS, Microsoft Power BI, Google Analytics.*

1. INTRODUCTION

Innovations are developing in all corners of the world, developed countries are at the stage of transition to the sixth technological order, represented by Nano - and biotechnologies, while Kazakhstan is moving to the fifth way, based on the development of information systems and telecommunications.

Kazakhstani innovative organizations rely on their own developed internal stages of the life cycle of innovation in order to enhance competitiveness. In general accessible public sources such as innovative organizations, educational institutions, research institutes describe only the characteristics of stages of the life cycle, but do not offer in practice algorithms for determining the stage of the life cycle of an innovative organization.

2. METHODS

To obtain information from innovative organizations to improve and develop innovation activities, research institutes conduct empirical studies of the life cycles of organizations and the initial stage is the use of rather cumbersome questionnaires to determine the current stage of the life cycle of the analyzed company, which does not show the general state of the innovation organization.

3. OBSERVATION METHOD

The purpose of the observation is to collect data for research on the problems of information support of innovation activities, taking into account the specifics of the individual stages of the innovation life cycle in order to formulate specific project proposals for improving the regional information support system for innovation activities.

The object of research - enterprises and organizations, leading innovation in various sectors of the economy. The subject of the research is the parameters that characterize the information supply of the activities of innovative enterprises and organizations.

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Most of the existing methods for assessing innovation are a functionally complex and costly processes. The calculation of metric systems requires a large amount of requested information, a long time for its processing and evaluation of the results of the analysis. Since innovation activity is a specific area of activity of enterprises, the complexity and laboriousness of the analytical process increases.

A separate stage of the innovation process is characterized by specific indicators that need to be investigated in dynamics, in comparison with the generally established or average, to take into account and identify the influence of individual factors on a particular phenomenon or process. Thus, all innovative processes are interrelated and interdependent and therefore should not be considered in isolation from each other. However, this does not exclude the possibility of a logical isolation of factors in the process of economic calculations. In this case, the degree of influence of each factor on the change in the object under study is determined under the condition that the influence of other factors is assumed unchanged.

In order not to use the abbreviations of the questions of the multidimensional questionnaire, it is necessary to conduct questionnaires at all stages of the life cycle of innovations. Representatives of innovative business often rely on the information of state statistics. At the state level, statistics on the activities of innovative enterprises are aggregated by the Statistics Committee of the Ministry of National Economy of the Republic of Kazakhstan. The collection of data on the innovative activity of organizations and the measurement of the innovation process at enterprises and organizations is carried out with the help of a statistical form of the national statistical observation of the Republic of Kazakhstan.

4. LIFE CYCLE OF INNOVATION (LCI)

The life cycle (LC) is a set of interrelated phenomena, processes, works that form a complete circle of development in a certain period of time. The life cycle of innovation (LCI) is a period of time during which innovation has an active life force and brings both the producer and the seller profit or some other real benefit. [1]. The LIC is also called the "innovation cycle" (IC). The essence of this concept is that each.

IC differ on kinds of innovations. These differences primarily affect the total cycle time, the duration of each stage within the cycle, the features of the development of the cycle itself, and the different number of stages. Types and number of stages of the life cycle are determined by the features of this or that innovation. However, each innovation can be defined with a "core", that is, a basic, foundation, life cycle with clearly defined stages [2].

The LIC or IC consists of seven specific stages (see Fig. 1), such as:

1. Development of a new product - organization of an innovation process, investment of capital;
2. entering the market - the product brings profit during the implementation period;
3. market development - the growth of sales of products on the market, the analysis of the time when a new product is actively sold and the market reaches saturation with this product;
4. Stabilization of the market - sales growth stopped;
5. Reduction of the market - there is a decline in the sale of the product, but there is demand for the product, therefore, there are objective prerequisites for an increase in the volume of product sales;
6. The rise of the market - demand exists, the producer studies the conditions of demand, changes its personnel and price policy, applies various forms of material incentive to sell the product, activates advertising. This allows you to increase sales for a period of time;
7. Market fall - there is a complete sale of the product or a complete cessation of the sale of the product due to its lack of demand from the buyer.

Modern realities dictate new conditions for development. Dynamically developing society predetermines the acceleration of all economic processes, today the question of time costs in certain situations is higher than the cost of material. These trends are also actual for the development of science, including economic analysis.

The need for operational management decisions determines the timing of the necessary analytical procedures, without affecting the quality of the results of the analysis. In the implementation of innovative activities, the need for rapid qualitative analysis increases, as today one or another information may be relevant, and tomorrow - no longer.

The innovation process of enterprise consists of several interrelated stages, each of which is subject to analysis. Enterprises in certain situations do not even suspect that by introducing new technologies, expanding the range, modernizing the production process, improving technological processes, they implement various innovative projects.

The effectiveness of their implementation is estimated only through the growth of profitability and profitability indicators, which of course, are one of the most important indicators, but do not

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investigate the specifics of such a phenomenon as "innovation". On the other hand, some manufacturers do not imagine it possible to introduce innovative technologies, due to the lack of financial opportunities for their development or acquisition. However, most enterprises have most of the necessary means, but their irrational use or incorrect determination of their quantity, in the absence of regular economic analysis, leads to inefficient use and redistribution of funds.

Modern trends in innovative development of individual industries and enterprises are characterized by a low level of innovative receptivity, despite the fact that economic entities have a fairly stable financial position, the availability of free equity, positive profit dynamics and profitability level.

This situation allows us to justify the need for the development and use of rapid methods for assessing the innovative orientation of enterprises, the questionnaire in particular, belongs to such methods.

One of the first who began to use this method was Francis Galton, who studied the origin of the mental qualities of the individual according to the respondents' self-reports. The results of the survey were presented by him in the book "English people of science: their nature and upbringing" [1].

The questionnaire is the main survey tool and is a document containing a structurally-organized set of questions, each of which is related to the tasks of the research being conducted. This connection is expressed in the need to obtain information reflecting the characteristics of the object under study. Questioning as a research method allows for a short time to get the maximum possible amount of information about a product, to get the opinion of the society on some issues and similar cases.

As it is clear from the name of the method itself, it is based on the main means, which fix all the data of the questionnaire. If to seek help from an explanatory dictionary, you can get such definition of the given word: the questionnaire is a set of questions (necessarily interrelated), for each of which the respondent should give a clear answer.

5. ADVANTAGES & DRAWBACKS OF QUESTIONING METHOD

The method of questioning has the following advantages:

• Efficiency of obtaining the necessary information;
• The possibility of organizing mass surveys;
• Insignificant laboriousness of the procedures for preparing and conducting research, processing their results;
• Absence of subjective predilection for any of the respondents.

Along with merits, the method of questioning also has drawbacks, among which one can distinguish:

• Impossibility of reformulation of issues, due to lack of personal contact;
• Insufficient reliability of the results, on the results of which various factors can merge

The method of questionnaire research is actively used in sociological, pedagogical, statistical research. In economic research, the questionnaire is not used widely enough, in view of the abstract nature of its results. In our opinion, well-formed and correctly formulated questionnaires that meet the research objectives and pursue its achievement are one of the components of information support for the innovative activity of enterprises.

The results of questioning the possibilities of implementing innovative activities will allow an objective assessment of the existing economic situation at the enterprise and will allow to project the results of responses to a specific model of innovative development. Practical application of the questionnaire in the framework of the assessment of the innovative orientation of enterprises will provide the apparatus for managing operational complex information about possible trends in the development of innovation activities at the enterprise, thereby increasing the effectiveness of the management decisions taken regarding further activities in the direction of innovation development.

6. SURVEY ORGANIZATION AND FIRST STEP ANALYSIS ADDRESSED TO KAZAKHSTANI ORGANIZATIONS

For a detailed study of the state of things in the issues of research, improvements, and the introduction of new innovative technologies in the production and sale of goods and services, we developed a questionnaire in the general version.

Survey Categories:

- Requisites of organizations
- Characteristics of organizations
- Financial indicators
- Innovative indicators
- Marketing indicators
- Scientific and educational indicators

For preliminary investigation via survey there were developed such questions as “indicate the area (segment) of innovation in your organization”, “what types of innovations has your organization had over the past three years”, “have you introduced

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product innovations in the last three years (new or significantly improved)", and so forth, with possible answer variants and open-ended answer options. These survey was conducted among different innovative enterprises in different regions of the Republic of Kazakhstan

The responses were processed in various analytical software packages using descriptive (see Fig. 1), regression (see Fig. 2-3-4), and visual analysis models (see Fig. 5). From the results of the survey, preliminary conclusions can be drawn with taking into account local specifics about the feasibility and importance of unified sources of data on the latest available research and development results for domestic organizations and industries.

From the results of the preliminary regression analysis (see Fig. 3-4-5), a high degree of importance of information support in professional activity is estimated. Thus, the preliminary research further continued must be resulted in useful, informative tools, sources for activating innovative works in enterprises

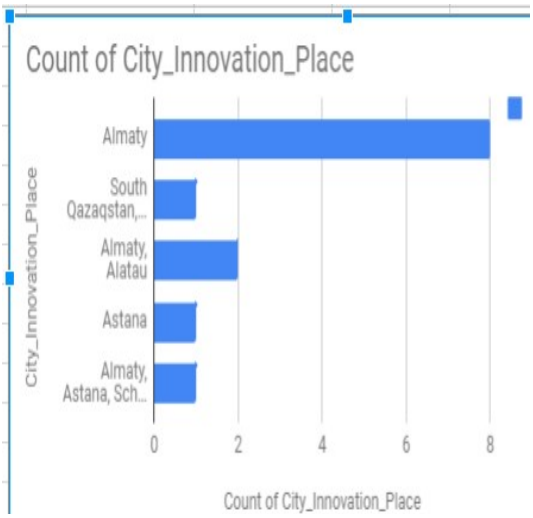

Figure 1 - Frequency Geographic Distribution of Organizations

	City_Innovation_Place	Number_employe...	Innovation_resource s_Own1_Republica nbudjet2_Loans...	Ecological_innovati on_No0_Product_1 Process2_Prod...	Innovation_impleme nts_new_improved_ Goods1_Service...	Are_your_goods_in novative_3_latest_y ears_No0_Yes1	Goods_volume_rec ent_year	Di ar
1	Almaty	120,0	1,0	,0	,0	,0	200,0	
2	Almaty	5,0	3,0	1,0	3,0	,0	50000,0	
3	Almaty	,0	,0	,0	,0	1,0	,0	
4	Almaty	10,0	1,0	,0	,0	,0	,0	
5	South Qazaqstan, East Qazaq...	2500,0	4,0	3,0	3,0	1,0	,0	
6		,0	2,0	1,0	,0	1,0	,0	
7	Almaty	170,0	1,0	,0	3,0	1,0	,0	
8	Almaty, Alatau	22,0	1,0	2,0	,0	,0	276,0	
9	Astana	7,0	1,0	,0	1,0	,0	100000,0	
10	Almaty, Astana, Schymkent	14,0	1,0	,0	2,0	1,0	,0	
11	Almaty	29,0	1,0	,0	,0	1,0	,0	
12	Almaty	1,0	4,0	,0	,0	,0	,0	
13	Almaty, Alatau	40,0	1,0	1,0	,0	1,0	1000000,0	
14	Almaty	37,0	1,0	2,0	,0	,0	,0	

Figure 2: Poll results data for processing in the IBM SPSS Statistics 22

Coefficients[a]

Model		non-standardized coefficients		standardized coefficients		
		B	standard error	Beta	Value	Value
1	(Const)	-1,457	2,138		-,682	,511
	Interested_receiving_new _info_regularly_No-0_Yes_1	-,182	,782	-,066	-,233	,820
	Importance_info_provisio n_No-0_Yes_1_Very-important_2	,953	1,015	,366	,940	,370
	Importance_payment_to_ other_organizations_for_i nfor_provision_No-0_V ery-needed-1_If-there-are-enough-sources-2_Yes-3	,457	,317	,394	1,441	,180

a. Dependent variable: Innovation_implements_new_improved_Goods-1_Services-2_Both-3 3

Figure 3: Regression Analysis Results

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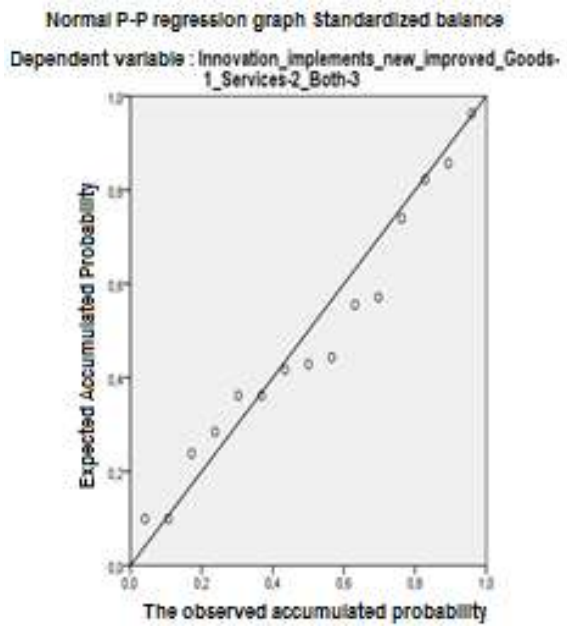

Figure 4: Regression Analysis Results

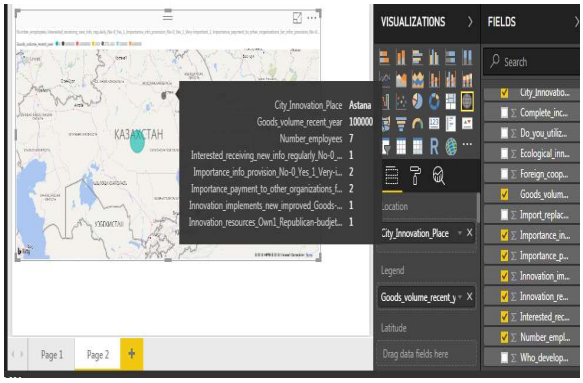

Figure 5: Visual representation of summary statistics in Microsoft Power BI environment

7. PRELIMINARY SUMMARY

The visualization of the geography of the application clearly demonstrates the undoubtedly higher involvement in innovation activity in more densely populated regions of the Republic of Kazakhstan

After the research of the LCI and the detailed development of the algorithm of the process of LCI work, a specialized portal for information support of innovation activities will be developed for individuals and legal entities that have requirements for relevant information in Kazakhstan.

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