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Evaluating the efficiency of innovative management in Kazakhstani healthcare system

Introduction

Nowadays services sector is a key driver in the creation of competitiveness, employment and economic growth as shows world experience. In addition, each research in the field of health care is very relevant. As a person is the main capital of the country, as noted in the Constitution of the Republic of Kazakhstan [1]. Innovative development of healthcare is the most optimal way to radically improve the health and quality of life of people, way to improve mortality of the population and solve the country's demographic problems. Special features of innovative approaches to managing organization are helpful in the midst of an economic crisis. Today, innovations in health care are more in demand than ever before.

There is a solid consensus in the need to improve innovation in healthcare organizations. Despite the fact that there has been significant improvement in healthcare companies, inefficiency still exists and little accomplished in understanding how to overcome those inefficiencies using innovation.

Innovation is an important contributor to productivity and economic performance for service firms and in recent years, scholarship on innovation has started to cover services under its research scope [2]. Value is now created by productivity and innovation, and knowledge has become the most valuable resource, especially in information intensive industries such as healthcare [3].

Enterprises may engage in innovation activity for a number of reasons, namely, to increase a firm's performance by reducing administrative costs or transaction costs, improving workplace satisfaction (and thus labour productivity), gaining access to non-tradable assets (such as non-codified external knowledge) or reducing costs of supplies. In healthcare sector work, management and innovation may be different to other industries in many aspects.

Methodology

The methodological basis of the study includes scientific and mathematical methods such as statistical analysis, classification and comparison. Authors use these methods for identifying economical efficiency of innovative management in healthcare system. Study presents the formulas, which calculate the level of efficiency and effectiveness of innovations.

Information base of the study includes data from Constitution of the Republic of Kazakhstan, international databases as Thomson Reuters, Springer and Scopus. Also was used reporting data on individual Kazakhstani enterprises and industries in healthcare sector.

Literature review

Many scholars investigated the role of innovative management in healthcare industry. For example, Blobel claim that in all developed countries healthcare industries face the challenge for improving quality, efficiency and safety of patients' care [4]. We think that innovations will be good opportunity for solving these problems.

Innovation in healthcare has being defined as a new way of helping medical professionals work smarter, faster, better and more cost effectively while providing high quality care [5]. Literature on healthcare services has recently focused on technological innovations and the role of information technologies (farther IT) in supporting process innovations [6]. Although acknowledging that IT application to healthcare promises significant benefits, particularly with regard to innovations in improving both clinical and administrative processes [7].

Many scholars assume that scientists should pay attention to uniqueness of healthcare sector. Because the healthcare sector is characterized as complex, turbulent, fragmented, and tightly coupled [8]. In the healthcare context, innovations associated with management of processes and activities in the hospitals and clinics are administrative/process innovations, while innovations in diagnosis and treatment methods (such as remote surgery technology e.g.), are product/service innovations [9]. Thakur focus on product/service innovation and define healthcare innovation as adoption of those best-demonstrated practices that have been proven to be successful and implementation of those practices while ensuring the safety and best outcomes for patients and whose adoption might also affect the performance of the organization. As he says, other scientists implies that understanding the challenges faced by healthcare organizations and learning how to overcome those challenges using innovation are major concerns for healthcare executives and practitioners [10].

To date, few studies have been devoted to understanding the drivers for the adoption of organizational innovations within healthcare organizations.

Contemporary researches highlight the important role of information systems (IS) and technologies in supporting effective innovation in healthcare sector [6]. Precisely, Gosh and Scott claimed innovation will occur when the operational, case management aspects of healthcare organizations is paired with knowledge management technology that is capable of exploiting the organizational knowledge wealth [11]. All this studies reveal the important role of innovations in healthcare industry, but literature review finds that there are lack of studies related to managing efficiency of innovations in healthcare sector.

Results and discussion

Innovations in the field of health care is implemented in the form of the creation of new technologies, medical devices, drugs, treatment techniques, or organizational processes introduced into the production of goods or services [12].

In addition, a particular classification of organizational innovation arises when analysing healthcare companies. Therefore, it is important to understand the differences between innovations specific for healthcare system in comparison with other industries. In health care innovation should be understood as targeted changes in the industry, including in its organizational structure and economic mechanism, aimed at increasing the efficiency of resource use and the quality of medical care, and also the greatest satisfaction of the population's need for health services. From the point of view of management of innovation activity, it is expedient to single out the following types of innovations in the field of health care, which indicated in figure 1.

Figure 1 - **The types of innovations in healthcare system**

As depicted in the figure 1, healthcare systems has own innovations which distinguish than other industries. It is very important to pay attention to this. It helps to abandon mistakes in performing innovative activities in healthcare industries.

Medical-technological innovations that are associated with the emergence of new methods (methods, methods) of prevention, diagnosis and treatment on the basis of available drugs (equipment) or new combinations of their application;

• Organizational innovations that implement effective restructuring of the health system, improve the organization of staff and organizational management structures.

• Economic innovations that ensure the introduction of modern methods of planning, financing, stimulating and analyzing the activities of health facilities;

• Information and technological innovations aimed at automating the processes of collecting, processing, analyzing information flows in the industry;

• Medical-pharmaceutical, medical and technical innovations, which are a form of medical technological innovation. But they are presupposing, as an imperative, the use of new medicines (technical systems), competitive in price and basic parameters of medical efficiency.

When talking about innovations in the healthcare system, one should include those that cover both the system of prevention and treatment of the disease, the rehabilitation of patients, the creation of fundamentally new drugs, new medical equipment and equipment, new information, accounting, management and other benefits that improve the quality of medical services [13].

Social innovations in Kazakhstan as a whole are aimed at improving the quality of life of the population. In the current demographic situation, the role of innovation in the health sector is particularly relevant. Further research focuses on the role of managing mentioned above innovations in healthcare system.

The content of planned organizational changes depends on the specific object of innovation. The objects of innovation include: goals; tasks; structure; technology; staff [14].

In order to understand the features of innovation management in the health care system, you need to focus on the management of innovation. Among the functions of innovation management we focus on the followings:

1. functions of the subject of management:

• Planning function - a set of activities for the development of planned tasks in the innovation process and their implementation in practice;

• The function of the organization is to unite people who jointly implement the investment program on the basis of any rules and procedures;

• the function of motivation - encouraging employees to be interested in the results of their work on creating and implementing innovations;

• control function - checking the organization of the innovation process, the plan for creating and implementing innovations, and so on.

2. Functions of the control object.

• Risky investment of capital - the organization of venture financing of investments in the market of innovations

• organization of the innovation process - rational organization of innovative activities to create, implement and disseminate innovations;

• organization of promotion of innovations in the market and its diffusion.

Methods of innovation management can be divided into 3 groups [15]:

• Techniques for creating a new product or a new operation (technology) with high quality parameters, affecting only the production of innovation: marketing techniques; benchmarking;

• Techniques that influence the production, implementation, promotion and dissemination of innovation: engineering innovation; reengineering of innovation, brand strategy;

• Techniques for accelerating the sale of innovations with the greatest benefit and efficiency, affecting the implementation, promotion and dissemination of innovation: pricing techniques, front-line market, the mayor.

Further study focuses on the efficiency evaluation of innovative activity in healthcare organizations.

The effectiveness of management may expressed through the efficiency of the operation of the controlling (control entity) and the managed system (control object):

$$Э_m = Э_{ms} \, x \, Э_{sm}, \qquad (1)$$

where: $Э_m$ – efficiency of management;

$Э_{ms}$ – efficiency of managing system (managed subject);

$Э_{sm}$ – efficiency of managed system (managed object).

Efficiency evaluation can be performed on the levels of sectoral management: country, region, organization, structural unit, product type, which is reflected in the content and used

indicators [16].When considering the issues of determining the effectiveness of innovation management, it is necessary to take into account the relationship of this category with the essence of the category of production efficiency, which is the basis for it. The efficiency of production directly related to the use of resources. In this case, the level of management effectiveness characterizes the degree of use of the facilities of the management object (labor, land, materials, financial resources). Therefore, the content of management may represented as follows: goal - resources - production - result - effect [17].

To assess the management used characteristics such as efficiency, economy and efficiency. The effectiveness of management is defined as the measurement of the result and the purpose of production (the degree of approximation to the goal).

Economical management - the measurement of the result and management costs (the price of approaching the goal).

Efficiency of management - timeliness of preparation and acceptance of administrative decisions (speed of approaching to the goal).

The main criterion for the effectiveness of management is the level of efficiency of the work of the agricultural organization.

The definition of management effectiveness is reduced to assessing the role of managers in achieving the goal and increasing the efficiency of production. For this, it is necessary to use indicators reflecting the growth of production efficiency as consequence of management effectiveness.

Indicators characterizing the effectiveness of management, determined by measuring the actual and planned indicators of production efficiency. To assess the performance of managers in the dynamics it is advisable to compare the performance of their work over a number of years. The indicator of efficiency of management of the i-m type of the functional subsystem (I_{Em}) is defined by the formula

$$I_{Em} = \Phi_{ef} : \Pi_{ef} \cdot 100, \quad (2)$$

where Φ_{ef}, Π_{ef} – respectively, actual and planned indicators of management effectiveness of the i-th type of subsystem (technological, social, ecological, economic).

Evaluation of the effectiveness of the performance of management functions determined by the achievement of the object of management of the objectives.

Study considers the management of innovations as the result of the impact of management functions and evaluate the effectiveness of the impact of functions in fractions (0 - fails, 0.5 - is not efficient enough, 1 - is performed effectively). Further, the effectiveness of the innovation management system determines by the product of the shares for each function. So, control system will work: ideally, with one of the functions performing less efficiently, when one of the functions of the control system does not work, all the functions of the control system are working effectively. The effectiveness of the management system as a whole determines by the efficiency of the worst performing function (the «weak link»).

To assess the effectiveness of the organization›s management, the following indicators are used [18]:

General effective indicators of management effectiveness: the cost of equity on average, thousand rubles, net profit (loss) per 100 hectares of farmland, rubles.

- Indicators of social efficiency: the ratio of the average monthly salary of the organization›s employees to the average for the region in percent, including employees of management;
- Indicators of the economic management apparatus: the proportion of wages of management employees in the annual fund of wages of employees of the enterprise in percent;
- Performance indicators of managerial labor: revenue from sales of products, works, services per 1 management employee, thousand rubles; net profit (loss) per 1 management employee, thousand rubles.

The useful effect of innovations in production and in operation can not always be estimated with the help of cost estimates, so two criteria are used: a criterion for the minimum of the given costs and an integral (generalizing) indicator of the quality of innovation.

If it is not possible to establish a quantitative functional relationship between the partial quality measures and the resulted costs, then expert or statistical methods used to determine the weighted average generalized measure of innovation, calculated as a weighted average or as a weighted average geometric measure.

Along with traditional methods that take into account the maximization of productivity and the minimization of costs, it is possible to use ballroom methods to assess the effectiveness of changes in the management system.

The method of comparison in calculating the effectiveness of innovation management can determine as followings:

1) the dynamics of the level of economic efficiency of innovation management in comparison with the pace of development of production in the economy, industries and divisions;

2) the level of economic management effectiveness before and after the introduction of innovations;

3) evaluation of the effectiveness of innovation management in connection with additional costs;

4) the level of effectiveness of innovation management in the surveyed farm in comparison with other (as a rule, advanced) farms or a group of farms;

5) the level of economic efficiency of innovation management in comparison with the whole set of farms.

To evaluate the management of innovations, the actual and planned indicators of management effectiveness, respectively, of the innovative subsystem are applied. The definition of the effectiveness of innovation management should base on general methodological principles, which reduced to calculating the cost ratio for its implementation with the results obtained. The definition of the effectiveness of innovation management has its own specifics, which derives from the features of management activity.

A general criterion for the effectiveness of innovation management may formulated as result of the functioning of a management system that ensures the achievement of the objectives that are before the object of management with the least expenditure. The effectiveness of innovation management depends on the successful implementation of functions and their interaction. The result from the introduction of innovation is expressed in obtaining an economic effect or improving the efficiency of the functioning of the organization, it affects the set of factors (economic, legal, technical, market, etc.), the impact of which is extremely difficult to predict.

The effectiveness of innovation management should be understood as a certain economic, production, social, environmental and other result expected from the introduction of innovation. The effectiveness of innovation is directly determined by their ability to save an appropriate amount of labor, time, resources and money per unit of all the necessary and anticipated beneficial effects of products, technical systems, structures [19].

In the literature innovation management distinguishes from innovation by next types of effects [20]:

1. Information - the amount of accumulation of new knowledge, skills, technological and managerial experience;

2. Resource - the amount of reimbursement of scarce resources, involvement in production of previously unused (indicators of the release of labor resources, the complexity of the use of raw materials, etc.);

3. Ecological - changing environmental parameters as a result of the introduction of technical and technological innovations (level of concentration of harmful substances in soil, water and air, the magnitude of nuclear radiation, industrial and transport noise, etc.);

4. Social - favorable conditions for personal development, realization of creative potential (reduction of the share of manual labor, increase in the amount of free time, increase in the standard of living of the population, etc.);

5. Economic - reducing the cost of a unit of manufactured products, operating costs, unit investment; satisfaction of new social needs, increase in sales volume, profit margins and the amount of national income; redistribution of resources between different spheres of employment, territories, branches;

6. Networking. The economic phenomenon, in which the production of each next unit of a

product or service, increases the utility of all the goods and services produced before. Thus, increasing in the network leads to development in the consumer value of its products.

Methodological recommendations used to assess the effectiveness of investment projects during analysis and evaluation of innovations. The evaluation of innovative project effectiveness is carried out on the basis of determining the indicators of its effectiveness:

• Commercial (financial) efficiency, taking into account the financial results of the project for participants;

• Budget efficiency, which reflects the financial results of the project for the federal, regional and local budgets;

• Economic efficiency, taking into account costs and results associated with the project, beyond the direct financial interests of the participants in the investment project and allowing a value measurement.

Other results (social, environmental, political, etc.) that are not amenable to valuation considered as additional performance indicators. New system of indicators may used by scholars to assess the overall economic efficiency of innovation. It is integral effect - the magnitude of the differences in results and innovation costs for the settlement period, reduced to one, usually the initial year.

We suggest new structure for managing innovative activity in healthcare system. This structure shown in the figure 2.

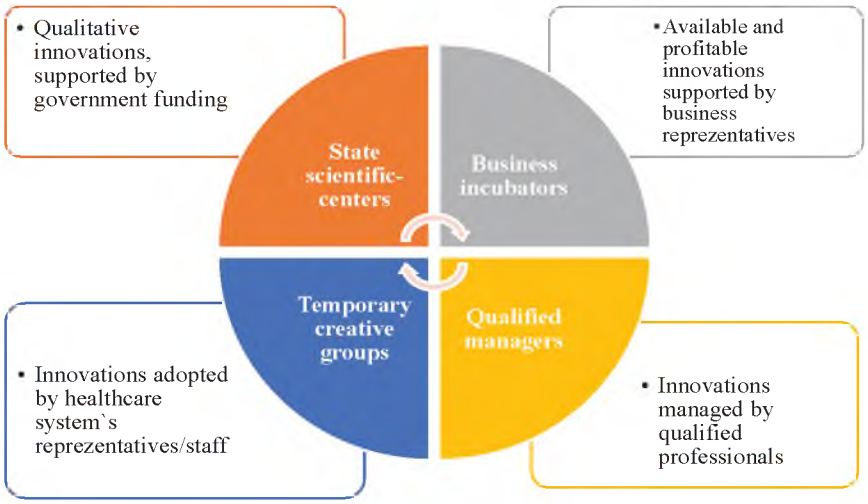

Figure 2- **Suggested structure for innovative management in healthcare system**

Let us explain the contents of the basic forms shown in Fig. 2. State scientific centers ensure the coordination of the state strategy for the development of science and technology with the economic and social interests of subjects of scientific and technical activity. Scientific centers and laboratories in the structure of corporate structures carry out R & D, organize the development and production of new products in healthcare organization.

Business incubator is a structure that specializes in creating favorable conditions for the effective operation of small innovative enterprises that implement original scientific and technical ideas. Here, beginning entrepreneurs get their own business skills, legal, economic and advisory assistance. Business-incubator can be created in different forms.

Temporary creative groups may build into hospitals or other healthcare organizations among personal who know this system very well. They can add they own experience and they know what will be sufficient in their professional life. Thus, qualified managers can manage all

these processes and show direction, control and communicate within this new system. They are guides of this new structure.

Conclusion

Innovative development of healthcare is the most optimal way to radically improve the health and quality of life of people, way to improve development of the population and solve the country's demographic problems. So, it`s still important to control and manage all this processes which focused on rising extent of use innovations in healthcare sector.

Authors found some disadvantages related to managing innovations in healthcare system. Precisely, there are lack of methods, which can measure efficiency of innovations in healthcare system. Thus, they offered unique formula which help to reveal is your investment was successful or no and identify the helpfulness of interbedded innovations in healthcare system. Study found the way to measure the level of efficiency of innovative management in healthcare system. Other authors may expand the study through applying this method in particular organization or industry. Also new structure for managing innovations in healthcare system may become a good instrument for rising efficiency in other different sectors of economy.

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Түйін

Ғылыми жұмыста денсаулық сақтау саласындағы инновациялардың мәні мен маңызы, осы саладағы инновацияларды басқару жүйесін жетілдіру жолдары қарастырылған. Сондай-ақ, авторлар денсаулық сақтау саласындағы инновациялық қызметті басқарудың тиімділігін бағалау әдістерін ұсынған.

Зерттеу барысында отандық денсаулық сақтау саласы экономикалық және әлеуметтік дамудың драйверлері ретінде бағаланып, бұл салада инновациялардың үлесі жоғары екендігі анықталған. Авторлар отандық денсаулық сақтау жүйесіне мемлекет тарапынан белсенді түрде қолдау көрсетілетіндіктен, мұнда яғни денсаулық сақтау саласындағы мекемелерде инновацияларға бөлінетін қаржы көлемі жоғары екенін айқындаған. Ал бұл өз кезегінде саладағы инновацияларды басқарудың өзектілігін күшейтеді. Сондықтан зерттеудің авторлары таңдалған саладағы кемшіліктерді анықтап, мұндағы инновацияларды басқарудың тиімділігін бағалау әдістерін ұсынып, осы тиімділікті арттыруға мүмкіндік беретін денсаулық сақтау саласындағы инновацияларды басқарудың жаңа жүйесін ұсынған.

Түйін сөздер: денсаулық сақтау жүйесі, инновациялық басқару, тиімділік, тиімділікті бағалау.

Аннотация

В работе рассматриваются значение и роль инноваций в системе здравоохранения, а также пути усовершенствования управления инновационной деятельностью в системе здравоохранения РК. К тому же, авторами предложен метод оценки эффективности управления инновационной деятельностью в сфере здравоохранения.

В исследовании было отмечено, что система здравоохранения Казахстана является одним из драйверов экономического и социального роста населения. Поэтому сфера здравоохранения остается одним из активных пользователей инновациями. Исследование выявило высокий уровень государственной поддержки и финансирования данной отрасли, что в последние годы послужило причиной привлечения большого объема инноваций в здравоохранение. Также выросла необходимость в эффективном управлении инновационной деятельностью. Поэтому авторами были предложены методы по оценке эффективности и по повышению эффективности инноваций в системе здравоохранения Казахстана, так же создана уникальная структура системы управления инновациями в здравоохранении.

*Ключевые слова: с*истема здравоохранения, инновационное управление, эффективность, оценка эффективности.

Abstract

Paper discusses the importance and role of innovations in healthcare system, the ways of managing innovative activities in healthcare industries. Moreover, authors present the evaluation methods of innovative activities` efficiency in healthcare system.

Healthcare system of Kazakhstan identified by authors as one of the drivers of domestic socio-economic grow and as industry which has high level of innovative attractiveness. Study found that healthcare system supported by government and attracts a lot of investment, therefore there are launched big amount of innovations, but they doesn`t managed efficiently. Authors found some disadvantages related to managing innovations in healthcare system. Precisely, there are lack of methods, which can measure efficiency of innovations in healthcare system. Study supports unique formula which help to reveal is your investment was successful or no and identify the helpfulness of interbedded innovations in healthcare system.

Keywords: healthcare system, innovative management, efficiency, evaluation of efficiency.