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Article

Economic Significance of Increasing The Efficiency of Innovation in Construction Enterprises

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Abstract: In the modern economic landscape, innovation plays a pivotal role in fostering growth and sustainability across industries, especially within the construction sector. The transition towards knowledge-intensive production and globalization has redefined innovation as a critical determinant of competitiveness and technological advancement. Despite numerous definitions and models, there remains no unified methodological framework for understanding and measuring innovation efficiency in construction enterprises. This study aims to analyze the economic significance of increasing innovation efficiency in construction enterprises and to identify effective strategies for enhancing innovation management. The findings reveal that innovation efficiency is directly linked to improved production quality, cost savings, better resource utilization, and enhanced competitiveness. Strategic integration of innovation through functional tools, alignment with market demand, and government support is critical for fostering sustainable development. This research presents a synthesized conceptual understanding of innovation through a multidisciplinary lens, offering a comprehensive definition tailored to the construction sector. It integrates insights from major economic thinkers while contextualizing innovation models in real-world enterprise dynamics. Strengthening innovation efficiency in construction not only boosts enterprise-level performance but also contributes to national economic development by attracting investment and driving technological progress. Emphasizing innovation as a strategic necessity encourages proactive policy-making and enterprise transformation towards long-term sustainability.

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1. Introduction

Currently, the post-industrial stage is characteristic of the development of the world's leading countries, at which the role and place of economic growth factors are changing. The factor of scientific and technological development has been added to the three traditionally considered factors - labor, land and capital. Information and knowledge, which are important resources for the innovative development of the economy, have acquired special importance, and human potential has played a decisive role in this[1].

The deepening of the globalization process in the world and the priority development of production based on knowledge-intensive technologies determine the necessary condition for the economic growth and improvement of the quality of life of any

country by innovative activity. Innovative activity, in turn, depends on the economic and scientific and technical capabilities of the state, its innovation policy and potential, as well as the moral state of society[2].

In the current stage of post-industrial development, innovation has emerged as a critical factor influencing economic growth, surpassing traditional inputs such as labor, land, and capital[3]. The construction sector, facing intense global competition and technological shifts, must adapt by integrating innovation to enhance productivity, reduce costs, and remain competitive. Innovation in construction is not limited to technical advancements but encompasses organizational, managerial, and marketing transformations as well. This article explores the theoretical and practical dimensions of innovation, emphasizing its role in shaping sustainable development and economic performance within construction enterprises amid evolving global economic dynamics[4].

2. Materials and Methods

The foundations of the development of innovative activity in high-capacity sectors of the construction economy have been studied in the works of such scientists from the CIS and foreign countries as: G. Wolfen, I. L. Tukkel, S. Kaplan, N. P. Maslennikova, B. Z. Milner, V. M. Mishin, I. Nonaka, G. Pisano, A. A. Streksi, R. Foster, G. Chesbro, A. A. Chursina. Let's consider the approaches of some of them[5].

In his work, G. Wolfen developed the forth method (an acronym for Full Steam Ahead, Observe & Learn, Raise Ideas, Test Ideas, and Homecoming). This method implies a clear sequence of actions for each stage of the innovation process and, according to the author, includes the necessary tools for the effective creation of new products and services. The work of this author is more psychological in nature and is focused on the personal growth of innovators than on the creation of specific mechanisms[6].

This article uses the methods of systematic and logical analysis, comparative analysis, technological shift, market attraction, integral, parallel organizational models, matrix, project systematization. In particular, a general classification of service and innovation processes in the management of construction enterprises is presented through a comparative analysis. Theoretical data are systematized from general to specific[7].

Innovation activity as an independent direction of general management emerged in the 10-20s of the 20th century. This period is characterized by the emergence of a technological and technical base for the production of goods and services. A global market has emerged in the world. The share of products produced as a result of new scientific research in the structure of manufactured products is increasing. The life cycle of many models of technical equipment (radio and television equipment, computers, cars, etc.) has decreased[8].

In economics, innovative activity is manifested as a process aimed at directly implementing scientific and technical development trends, creative and practical developments, and research results into practice. Since the essence of the category of "innovation" is a rather broad concept in socio-economic, organizational-managerial and technological terms[9]. The field of innovative activity and trends is wide-ranging and includes not only the practical use of scientific and technical, technological innovations and developments, but also changes in the manufactured goods, labor processes, marketing, production organization and management processes[10].

Although the scientific literature provides many different definitions and coverage of the term "innovation" and proposes a multifaceted categorization of processes related to this phenomenon, there is no common approach to the general terminology and classification of this field[11].

The first to study the concept of “innovation” as an economic category was the economist Joseph Aloiz Schumpeter, who, according to his approach, “innovative activity is the pursuit of improving a product or creating a new one, introducing a new technology

or developing new sales markets, acquiring new forms and new sources of supply, and optimizing the labor and production process" [12]. In the context of economic transformation, innovation is considered a specific function of the process and factor of change. According to J. Schumpeter's approach, innovation is not a process of improvement, but a significant replacement of the production function, a new combination of labor and production means[13]. It should be noted that J. Schumpeter was primarily interested in the impact of the introduction of innovations on economic activity, and this was considered to be the introduction of a new function into an existing finished product. Ultimately, it is said that profit is a level relatively higher than the average. According to Y. Schumpeter, the use of innovations implies, first of all, not an increase in existing factors of production, but rather an adaptation to new conditions of effective use of existing factors[14].

J. Schumpeter describes the functional tasks of the innovation sector as follows: commercial analysis of potential consumers of innovations; search for promising ideas, sources of availability; organization of the creation and introduction of innovations; reproduction; maintenance and destruction[15].

The innovation sector includes scientists, inventors, design departments, venture and scientific and technical organizations, and finally the education system, who create and implement innovations. Due to the high level of abstraction and risk inherent in innovation, conducting research on predicting its results remains a complex task[16].

At the same time, a number of Western economists (P. Drucker, R. Foster, B. Tviss, K. Christensen, M. Raynor) also provided complementary definitions to explain the concept of "innovation". Y. Schumpeter is the founder of the theory of economic growth dynamics. The main principles of this direction were developed by N. Kondratev within the framework of the theory of long waves[17].

The theory of innovation was developed in the research of G. Mensh, who distinguished two theoretical aspects: technological impetus is considered the basis of innovative changes, and depression occurs in the "downward" role of innovative activity. He proposes to provide a connection between the periods and rates of economic growth and the intensity and nature of innovative activity, dividing innovation into three main types: "base, uptrend and pseudo-innovation"[18]. The author considers the deterioration of the financial condition of enterprises as an important driver of the activation of innovative activity, while innovations are identified as an important tool for increasing the efficiency of investments and the "technological feather" they indicate to be a sustainable way to overcome stagnation in economic development[19].

Currently, two important approaches are considered the main ones in the theory of innovation, namely "technological impetus" and "demand impact". They explain the factors based on practical experience using various variations and offer different tools for illuminating practical management issues . Depending on the content, these views have a cyclical nature or represent a gradual transformation of the socio-economic system[20].

The doctrine of gradual development as a means of scientific and methodological knowledge first began to take shape in the 1960s and 1970s, and it rejected many of the initial principles of neoclassical theory[21].

Research within the framework of the process approach is highlighted in the works of B. Santo, who defines the concept of "innovation" as follows: "Innovation is a socio-economic process of practical use of ideas and discoveries aimed at creating products, technologies that are the best in their characteristics, and if the innovation is aimed at economic efficiency (profit), its appearance on the market can bring additional income" , and also the goal of innovative activity can be not only profit, but also social well-being[22].

U. Ye. Sauder and A. S. Nashar define innovation as the result of activities embodied in new or improved products, new or improved technological processes used in practice,

new services aimed at meeting social needs, and new approaches based on market demand[23].

According to P. Drucker, “innovative activity is an important tool that allows an entrepreneur to use changes and increase their new capabilities to open new businesses and provide new services.” He draws attention to the importance of analyzing and reflecting on existing opportunities as the main principle of successful activity, and believes that “the goal-orientedness and systematicity of innovative activity” are of primary importance . P. Drucker emphasizes that “innovation is more of an economic term and covers the entire structure of enterprises, all their activities and functions”. He notes that “...every entrepreneur is engaged in innovative entrepreneurial activity at his production facility. At the same time, entities engaged in specialized innovative activities serve all areas of entrepreneurial activity in general, on the basis of organizing methods for improving the production process with innovations obtained in the development of science and technology”[24].

B. Tviss includes the following areas in the concept of innovative activity - "technical, production and marketing activities aimed at the commercial use of a new (or improved) product or the initial commercial use of a new (or improved) production process or equipment". Noting the constant need for this activity of enterprises, the researcher defines its goals as "the acquisition of the economic content of ideas or discoveries"[25].

K. Christensen and M. Raynor define innovative activity as follows: “innovative activity is an activity aimed at using the results of scientific research and developments to update the nomenclature and improve the quality of the manufactured product, improve the technologies for its preparation” . The authors divide innovations into two types: “supporting” and “explosive”. “Supporting” innovations are activities aimed at improving existing products within the current consumer profile, while “explosive” ones are activities aimed at capturing existing products, technologies, industries and markets, created on the basis of being inexpensive and simple to use, not highly different from the new type of product[26].

R. A. Fathutdinov defines innovative activity as a process of strategic marketing, implementation of scientific research developments into practice, organizational and technological preparation of production, development and formalization of innovations, their introduction (or transformation into innovations) and popularization in other areas. According to the author, “innovative activity represents, first of all, the content and structure of specific actions carried out in accordance with specific technologies, work procedures” [27].

I. L. Tukkel together with A. V. Surina and N. B. Kultin define innovative activity as “activity aimed at experimental developments, scientific (research) and scientific-technical, inventive activities: production and sale of products (goods, works, services) that are new or have new consumer properties; creation or introduction of new ones or modernization of existing methods (technologies) of their production, popularization and use; development and sale of products (goods, works, services) based on cost savings or an increase in the volume of development and sales of products in demand in the market, introduction of productive, process, marketing, organizational innovations (novelties) in the organization of production”. The authors define “innovative programs and projects, innovative products” as the object of innovative activity and divide innovative activity into product, process, marketing and organizational directions[28].

L. N. Ogoleva interprets innovative activity as “a purposeful system of development, mastering, introduction, diffusion and commercialization of innovations, this process being systematic, complex, multivariate and alternative”. The author defines innovative activity as “from the birth of scientific ideas to their commercialization” and defines the boundaries of innovative activity[29].

F. F. Bezdudnýy, together with G. A. Smirnova and O.D. Nechayva, emphasize that innovation has only a positive result, excluding possible negative consequences, and on the contrary, it loses its meaning, connecting the concepts of "innovation" and "innovative activity" with the process of introducing new ideas in any sphere of human life that are able to satisfy the existing demand in the market and bring economic benefits[30].

N. M. Sysarova interprets innovative activity as “a set of activities that include the search and selection of innovative ideas, the development of the basis for them, the introduction and multiplication of innovations.” According to the author, “the process of introducing innovations covers various areas of activity: scientific and technical, financial, information, marketing, and its implementation involves various participants in the interaction between organizations: research institutes, financial and consulting organizations, venture firms, insurance companies”[31].

I. T. Balabanov defines innovative activity as "a process aimed at the development and implementation of final research results and developments or other research achievements in new or improved products sold on the market, improved technological processes used in practical activities, and additional scientific research and developments related to this"[32].

The popularization of the category of "innovation" in the social sphere has expanded its scope. In the studies of P.N. Zavlin and in the collection edited by A.Ye. Kogut, it is emphasized that the use of the concept of "innovation" to denote novelty in any field of human activity, that is, any change that leads to a difference in the existing state of an object, can be considered an innovation[33]. In the economic literature, this view is cited in the work of I.B. Gurkov: "Innovation is the adoption of an idea (thought) or a way of doing things (system, program, device, process, product or service), which is considered new for the organization adopting it". According to this approach, innovation is understood as any change in various fields of activity at the level of an enterprise or organization. In our opinion, this approach to the concept of "innovation" can be called rather limited. Therefore, it can be noted that there is no single methodological approach and principles for explaining and evaluating the term "innovation"[34].

V. I. Gunin's work emphasizes that innovative activity includes the development and practical implementation of technical, technological, and organizational-economic innovations, which are reflected in the innovative process. In addition to innovative processes, he also includes "marketing research, organizational, information, consulting, social and other types of services" in innovative activity[35].

I. Ya. Luzhinsky and MP Pereverzev define “innovative activity” as “an integrated concept combining scientific, technical and investment activities”. In this regard, the author emphasizes that when considering the concept of “innovative activity”, it covers the entire period of creation and use of new technologies and goods[36].

A more detailed definition of "innovative activity" is given in the regulatory and legal documents of our republic and international. Currently, the essence of the concept of "innovation" has been developed by the leadership of the Organization for Economic Cooperation and Development in order to solve the tasks of obtaining and analyzing information on science, technology and innovation. According to it, innovation is the final result of innovative activity in the form of a new or improved product introduced on the market, a new or improved technological process used in practical activities, or a new approach to social services[37].

According to Uzbek scientist X. M. Abdusattarova, “innovation is the formalized result of fundamental and applied research in any field of activity aimed at increasing its efficiency”[38].

In the research work of F. B. Shakirova, the author's definition was formulated: "Innovation is a set of innovations, inventions, discoveries, ideas and new approaches in

the form of intellectual property, created on the basis of human intelligence and production experience, applied to production, and at the same time bringing economic and social benefits". If an innovative idea is created, but is not applied to production, if it does not prove its economic viability, it is not considered an innovation[39]. The created innovations can be considered innovations only when they are commercialized, put into practice, and bring economic and social benefits. According to this definition, innovations do not consist of ideas, developments, discoveries, but rather embody completely new innovative approaches and principles in the organizational and managerial characteristics of the organization, management and effective implementation of production objects that serve general development[40].

According to A. J. Kakhorov's approach, when marketing is considered as an economic activity, the new tools and methods used in it are also innovative activities. Accordingly, according to the author, "Innovative marketing is an activity aimed at searching for new ideas, creating products and improving existing products, and commercializing them using innovative technologies"[41].

According to G.B.Shanazarova's approach, innovative potential is recognized as the most important component of economic potential, a category that is inextricably linked to the concept of scientific and technical potential. In her opinion, "innovative potential is the sum of the available intellectual, financial, personnel, information, material and technical and other resources and capabilities of a voluntary economic entity, regardless of its affiliation, form of ownership, organizational and legal status, and size, to effectively apply them in the development of new developments, discoveries, inventions, and creation of useful models"[42].

According to I.I.Ergashev's approach, "innovation is the result of a change in knowledge embodied in a new economic product, implemented in practical activities, implemented in the market as a process that brings about certain economic, social, managerial and other effects".

D. A. Rakhmonov believes that it is important to define and implement a criterion for measuring innovation in order to accept new ideas as innovations. This, of course, creates the conditions for economic evaluation for the implementation of innovations.

3. Results and Discussion

Taking the above into account, in clarifying the essence of the category of "innovation", we focused on its main features.

- the concept of innovation represents the introduction of new products or services, methods of their production, innovations in organizational, financial, scientific research and other areas, and the creation of opportunities for cost savings;

common to various types of innovations (basic, applied, product diversification, new types of products and services). Without this stage, there is no innovation. This is the main content of the concept of innovation.

These characteristics are the direct properties of innovation, including their novelty, their applicability in new production, their economic efficiency, and, of course, their ability to meet consumer demand.

In our opinion, taking into account the specific features of the concept of innovation, we interpret it as follows: "innovation is the result of activities that introduce new products or services, methods of their production, innovations in organizational, financial, research and other areas, create the opportunity to save costs, implement a new life cycle of the product, bring profit to the manufacturer and demonstrate the successful use of the new product by consumers."

Nowadays, innovative activity is an integral part of modern industrial sectors. Therefore, issues related to the development of innovative activity arise first of all.

G. Pisano identifies the main problems of managing innovation activities in companies as a discrepancy between innovation strategies and other activities, the complexity of determining priorities among innovation projects for their financing. He suggests developing the following functional tools as a way to solve the indicated problems: “ensuring consistency and interdependence between the organizational structure and implementation procedure of financial resource allocation, processes, innovation strategies; the formation of specific goals of companies aimed at ensuring sustainable competitive advantage; the development of plans for the formation of prices; the introduction of a parallel execution procedure for the selection and implementation of various types of innovations; finding a balance between different innovation strategies”.

According to R. Foster and S. Kaplan, the main problem of innovative activity is “its dependence on external environmental conditions, suggesting a solution that takes into account alternative ways of obtaining innovations and changes in the approach to strategic planning”.

Summarizing the above points, it can be said that innovative activity is an activity that ensures the organization of innovative ideas and developments, their application and implementation in the production sector.

According to the point of view of V. P. Barancheev, N. P. Maslennikova, V. M. Mishin, the features of innovative activity management are “the object of management of the life cycle of innovations and innovative products arising on the basis of the previous knowledge of highly qualified specialists gathered in one place”.

Many prominent scientists have tried to shed light on the nature of the emergence of innovations and the forms of organization of enterprises that are most favorable for the implementation of innovative activities. Currently, the popularity of models describing innovation processes is reflected in the following:

a. The "technological impulse" model. This model has long been considered a classic, and was developed in their research by scientists such as M. Tugan-Baranovsky, J. Schumpeter, G. Mensh. In this model, the role of the source of innovation is considered to be high-level achievements in science and technology. The "technological impulse" model is presented in the form of a linear and periodic sequence of stages. Based on this model, linear-sequential processes related to scientific research developments are derived;
b. “Demand” market pull model. Proponents of this model is K. Freeman and D. Roman within this model, successful news commerce consumers Fan capacity on demand high industry networks modern and suitable impact as a result manifestation will be. Innovative processes basis as scientific research construction developments direction determining market demand looking at exit is considered . Innovative processes composition stages sequence linear is considered;
c. Innovative activity attachment model (coupling). Its based on R. Rotuella, D. Moveri and others' works This model is as follows: in the description there is stages to oneself connects: sequence, mutual relationship, functional isolation news create process linear that it is not shows. The model based on innovative of activity resources capacity high was stages as developments and constructions processes within is being built;
d. Innovative of processes integrated model. This model founder is M. Aoki. It is different kind in directions worker one group of experts ideas integrity is based on. Convenient approach the process to accelerate is based on. So that's new of the goods to the market entrance research, development production, marketing, finance and of companies other departments integral in cooperation with the most effective This was calculated. the process control to do for inter-network worker group to be necessary;
e. Strategic networks in the model innovative processes. This direction manifestations, R. Cooper, K. Oppenlender is. Previous from models difference not only functional, maybe institutional or network to the description has. The model is final purpose

innovation calculated external with agencies (supplier, consumer, competitors) mutual impact looking at will be released.

Fan capacity high networks formation features to the analysis many works dedicated, but this of affairs analysis this shows that they have the capacity for science high networks identification (exactly) analogy) in mind catcher only methodology there is not. In this case, the capacity of science high to networks relevant criteria main directions determination possible .

So from directions one scientific research and construction developments expenses ratio and appropriate products working release size science capacity high networks with in connection is related. So that is, A. Ye. Varshavsky in my opinion, the capacity of science high to networks relevant calculated , if "network" of activity consequential to the indicator scientific research and construction developments expenses ratio as calculated fan capacity representative indicator general at the level industry for to oneself uniqueness or average increases". Science capacity high to networks affiliation criterion in the formation I.E.Frolov this according to networks product working release to the size scientific research and construction developments expenses ratio developed of countries again work in the industry average world increase the indicator by 1.2 -1.5 times increases and 3.5-4.5 % organization will come".

Fan capacity high networks classification again one direction in enterprises personnel description assessment is considered. Therefore according to V. L. Makarov, A. Ye. Varshavsky and L. A. Fedorova's in my opinion, the capacity of science high networks following relationship based on is defined as: "network personnel industry working to release service indicator scientific busy with work number; scientific research and construction developments directed industry working release to the personnel , the network main working release to the funds expenses ".

Current at the time high to technologies following economic activity appearances related: electronic and radio electronics industry, office equipment working release and calculation technique, calculation and control tools, pharmaceuticals products and medicine items, exit devices.

To knowledge based new economy to the formation high at the level impact indicator and services working exhaust fan capacity high economic activity to the appearances the following includes: education, health conservation, scientific research and developments.

4. Conclusion

In conclusion, increasing the efficiency of innovation in construction enterprises holds significant economic importance for both micro and macroeconomic development. Efficient innovation enables construction companies to reduce production costs, improve the quality and sustainability of infrastructure, and accelerate project timelines. At the same time, it contributes to the competitiveness of the national economy by fostering technological progress and attracting investment.

The study reveals that innovation efficiency is closely linked to the effective management of resources, human capital, and organizational capabilities. Emphasis should be placed on developing innovation strategies that are aligned with market demands, digital transformation, and environmental requirements. Additionally, state support in the form of favorable legislation, financial incentives, and innovation infrastructure plays a critical role in stimulating innovation activity in the construction sector.

Thus, the integration of innovative solutions is not merely a technical advancement, but a strategic necessity for long-term economic growth, sustainable development, and increasing the global competitiveness of construction enterprises.

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