DOI: https://doi.org/10.30837/MMP.2023.150

FORMING THE INVESTMENT ATTRACTIVENESS OF INNOVATIVE INVESTMENT PROJECTS ON THE BASIS OF INCREASING THEIR COMMERCIAL POTENTIAL IN THE FIELD OF ENGINEERING SERVICES

Fonarova T., Bushuiev M., Petrenko V., Bushuiev K.

The study deals with the formation of the investment attractiveness of innovative projects in the activities of Ukrainian enterprises with the involvement of engineering companies. The necessity of coordinating the goals of the enterprise and the motives of investors is substantiated. It is noted that the basis for cooperation and pooling of efforts can be the determination of an integral indicator of investment attractiveness – the commercial potential of an innovation-investment project. Modern approaches, the essence and components of the formation of commercial potential are considered. The role and importance of engineering companies in increasing the commercial potential of innovative and investment projects is shown on the example of the innovative technology «Simatic System Audit» of Siemens Corporation. The marketing component in increasing the commercial potential of an innovation-investment project has been studied. The role and importance of engineering companies in promoting this technology to the Ukrainian market of industrial enterprises is emphasized.

Introduction

The relevance of the research topic is due to the need to attract investment for the post-war revival of Ukraine. After all, as a result of the war, the country's economy was practically destroyed. And the task of scientists is to conduct research that could help the rapid and high-quality restoration of the state. On this path, it is innovative projects that will play the main role, causing innovative development.

The direction of Ukraine to the EU opens up opportunities to attract European investors and funds. But there is a problem of creating an investment-attractive climate in the country, the interest of potential investors. The first step in this direction is the formation of investment attractiveness of innovative projects. Considering the search for and attraction of investors, the second important step is to study the problem of increasing the commercial potential of innovative projects.

Thus, the object of research is the process of formation of investment attractiveness. The subject of the research is theoretical and practical approaches to increasing the commercial potential of innovative projects through the activities of engineering companies.

The aim of the study is modern approaches to the development of investment attractiveness based on increasing the commercial potential of innovative investment

projects (IIP) to attract and effectively invest resources in the post-war revival of the country's economy.

For this, the following tasks are set:

– to determine the parameters of the investment attractiveness of IP through a comparison of the objectives of attracting and motives for investing;

– to analyse approaches to the formation of investment attractiveness of IIP;

– carry out a study of the concepts of the commercial potential of IIP, both from the point of view of the producer and the consumer of innovative technologies;

– substantiate the role and importance of engineering companies in the promotion of innovative technologies as an element of increasing the commercial potential of an innovative investment project;

– consider the process of promoting the innovative technology «Simatic System Audit» by Siemens Corporation using a specific example.

The issues of the essence and formation of the investment strategy were dealt with by such leading scientists as R. Akoff, I. Ansoff, I.O. Blank, B. Karlof, D. Kliland, P. Masse, A.R. Sterlinh, A.A. Tompson, A. Dzh. Striklend, V.D. Shapiro, N.M. Huliaieva, A.A. Peresada, D. Chervanov and other.

Considerable attention in scientific works is paid to the issues of assessing investment attractiveness at the micro level – investment portfolios, projects, at the meso level – enterprises, industries, at the macro level – the region, the state, such authors as V. Berens, L. Hitman, Dzh.Soros, U. Sharp, A. Sheremet, I. Blank, A. Peresada, V. Shevchuk, P.Rohozhyn, A.Hoyko, M.Kreynina and other.

The concept of the commercial potential of innovations has been studied by leading scientists such as P. Pererva, T. Kobieleva, O. Butnik-Siverskyi, P.M.Tsybulova, A.S. Romashko and other.

The issues of formation of investment attractiveness of innovative projects on the basis of increasing their commercial potential in the field of engineering services remain unresolved.

Research methodology

The theoretical and methodological basis of the study under consideration are the scientific methods of economic theory in the field of assessing investment attractiveness and commercial potential using an abstract-logical approach in the process of studying economic processes and phenomena, in particular:

– scientific generalization, when considering the place of commercial potential in the process of forming the investment attractiveness of innovative projects in the field of engineering, through consistent actions to build specific single facts into

a single whole in order to identify typical features and patterns inherent in the phenomenon under study. This will reflect the general features of the process of formation of investment attractiveness as the main factor in raising funds and the priority implementation of such a project at the enterprise. The versatility of the components that make up the investment attractiveness of an innovative project and the inclusion of commercial potential in this process as a necessary element involves dividing it into components using generalizing indicators – indicators that determine it;

– a dialectical method, thanks to which the economic phenomena of commercial potential are considered as an integral indicator for evaluating an innovative project at all stages to minimize risks in their continuous movement, interconnections and interaction, when the accumulation of quantitative changes entails qualitative changes based on change management, and the source of sustainable development of the enterprise is the successful implementation of innovative projects, in determining the place and role of the commercial potential of innovation in the strategic management of an enterprise;

– a genetic approach in studying the macroeconomic environment, world experience and determining the stages of the formation of commercial potential, based on the principles of the dialectic of unity and integrity;

– the metaphysical method requires a focus on the static state of the object of economic research, outside of its connections with other objects, on its functioning, and not development. Within the framework of the so-called functional approach, investment attractiveness is assigned the status of a function, and variable arguments are the criteria that affect it. Thus, the functional relationship between them is investigated (when establishing the mathematical dependence of the influence of factors in the evaluation of an investment project);

– scientific abstraction, using only a part of the set of relevant data about an innovative project and adding new information to this part, regarding the commercial potential that does not directly follow from this data;

– the theoretical provisions of system analysis when decomposing the activities of both an engineering company and a customer's enterprise into different subsystems and groups of indicators; in the development of innovative projects and their implementation, in particular:

– methods of system analysis, both formal and informal, such as "brainstorming" methods for searching for new ideas, expert assessments, for assessing the investment attractiveness of innovative projects, diagnostic methods for studying the system, involving its division into its component parts –

subsystems make it possible to identify internal structure, properties, features, functions, etc. in order to improve the forms and methods of its work, it allows to identify weaknesses, problem areas, to which investment funds should be directed for the implementation of innovative projects, which ensures the achievement of the overall goals of the enterprise's sustainable development strategy;

– economic and mathematical modeling when building a model that allows simulating market conditions within alternative scenarios for the formation of the commercial potential of an innovative project. A causal structure is established, one or more scenarios are developed, and the return on investment is evaluated for each scenario chosen. The causal structure is established and verified experimentally, in conditions subject to objective observation and measurement.

The structure of the study is formed on the basis of understanding the innovative activity of the enterprise, the need to develop and implement innovative projects, the formation of their investment attractiveness, the role and place of engineering companies in the implementation of these projects and the increase in commercial attractiveness, shown in Fig. 1.

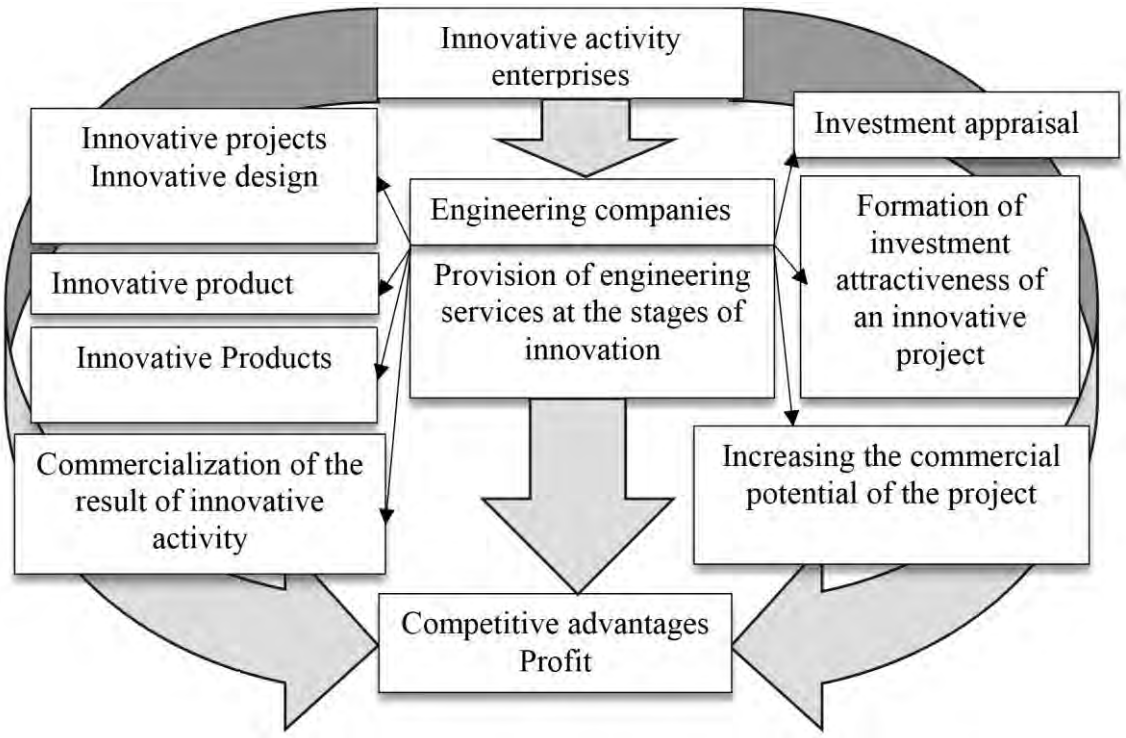

Fig. 1 The role and place of engineering companies in increasing the commercial potential of innovative projects (*developed by the authors*)

As can be seen from the figure, engineering companies play an important role both in the development and implementation, and in shaping the attractiveness of

innovative investment projects for investors. This is due to the fact that such companies are both active players in the market of industrial enterprises and in the market for the transfer of innovative technologies. In addition, their activities in the market make it possible to form investment attractiveness and increase the commercial potential of innovation and investment projects through the marketing component. It is these questions that this study is devoted to.

Results of the research

Engineering companies work in the market with enterprises acting as customers of services. Therefore, the task for such companies is to find customers who would be interested in the innovative renewal of their enterprises in accordance with the phase of the life cycle, that is, they were ready to implement innovative projects. But IIP always needs investment resources. The attraction of which is possible only under two conditions:

– firstly, the company has such opportunities and is ready to invest;

– secondly, the enterprise does not have resources and seeks to obtain funds from outside.

Unfortunately, as a result of hostilities on the territory of the country, domestic enterprises found themselves in a difficult situation, so the first condition is impossible for most enterprises. There is a problem of finding investors. In this case, the management of the enterprise-customer of the innovative project must take into account all aspects that are important for the investor. That is, in other words, to form in a certain way the investment attractiveness of an innovative project that needs to be implemented at the enterprise.

The assessment of investment attractiveness itself includes many factors, so it is often difficult for enterprises to determine exactly those that would satisfy a particular investor and provide him with a certain justification for the expediency of investing. This is due, first of all, to the fact that the goals that the enterprise-customer of the IIP sets for itself and the goals of the investor may not coincide somewhat. So, when implementing an IIP, an enterprise focuses on achieving specific goals related to a certain phase of the enterprise's life cycle, as a rule, these are long-term strategic goals of sustainable development.

But an investor (portfolio or strategic investor, credit organization, venture company, etc.) is engaged in the fastest way to get investment results, that is, he asks what are the potential opportunities of an innovative project, whether its implementation will be able to generate a return on invested capital. Therefore, the task of forming such parameters of the investment attractiveness of an IIP that

could combine the goals of an enterprise that seeks to raise funds and an investor, taking into account the possibilities of the post-war revival of the country, is relevant.

Investment attractiveness is a set of factors, the analysis of which indicates the possibility of investing in a particular object and obtaining a certain effect from a completed operation, that is, it is a set of features that allow a potential investor to assess how much an investment object is more attractive than others, for investment of available funds [1].

The investment attractiveness of an innovation and investment project is formed taking into account the resources and goals that all participants in the process seek to achieve. So, the factors that form the investment attractiveness of IIP:

– the prospects of the investment project, that is, the amount of income from the implementation of the project; market trends are studied and evaluated and its development in a certain period is analyzed;

– the investor's opportunities for the development of the enterprise: the opening of new diversified areas of activity, the selection and training of personnel, the improvement of material and technical equipment;

– the presence of real and potential competitors in the market, the presence of competitive advantages and the ability to withstand competition in the future;

– the ability to optimize the production process, the introduction of new technologies and scientific inventions [2].

If approached from the point of view of assessing the feasibility of investing funds by investors, then a model should be considered that includes two criteria: the commercial potential of the project and the risks of investing capital.

For example, an assessment of the commercial potential of an SMPS may include the following blocks:

1) scientific and technical potential;

2) resource potential;

3) market potential;

4) economic and social potential [3].

When assessing the commercial potential, the authors focus on the market component, i.e. effectiveness of the marketing system; in particular, on the active market behavior of both the enterprise-developer, the enterprise-customer (consumer) and the engineering company.

Since the study is specifically about the provision of engineering services, the objects of investment, in addition to tangible assets, are also intangible ones: intellectual property (IP) objects (patents, licenses, know-how, software), rights to use land and other resources, property rights, staff development expenses, etc.

There are two types of investments in innovative technologies: financial and scientific and technical (intellectual). Intellectual investments are made in the form of:

1) acquisition of exclusive rights of use – the purchase of patents, licenses for inventions, industrial designs, trademarks;

2) the acquisition of information services through the hiring of various kinds of specialists – scientists and practitioners under a contract or through a one-time acquisition of information services;

3) the acquisition of scientific and technical products, that is, intellectual goods in material form;

4) investment in human capital, that is, the cost of education, training and retraining of personnel, training, etc. [4].

As far as investment risks are concerned, valuation reduces the risk of loss and helps to predict compensation and/or profits for all participants in the process. The object of analysis is not the project itself, but the cash flows associated with it. The implementation of the project is a complex and multifaceted process, and it is very difficult to calculate and predict the scenarios in detail. For the analysis, economic and mathematical models, expert methods of collecting information are used. First of all, the following are subject to evaluation: risk and profitability indicators that affect the results of the investment project; payback periods [2].

The scientific and technical potential that has developed at the enterprise (expressed through product and technological characteristics) and the possibilities of international technology transfer require the search for the optimal combination of own research and development work (R&D) and borrowed scientific and technical results. Such a connection is manifested in the selective scientific and technological development of innovative enterprises. In those areas of science and technology that are not within the sphere of specialization of an individual enterprise, an increase in the technical level is achieved through technology transfer. The acquisition of technology compensates for the lack of R&D spending in non-core industries [4].

The technology marketing management process consists primarily of the planning of innovative projects in the enterprise. This means that at this stage it is necessary to decide what innovations or technologies are needed, to decide whether to develop it independently by the R&D department, or, more appropriately, to invest in relevant innovations. The information system should have an appropriate technology and innovation marketing subsystem to explore the best practices of leading companies based on a benchmarking approach. The manager receives comprehensive information and decides which technologies should be purchased

and which ones will be developed at the enterprise. The second stage is the evaluation of investment investments, that is, making a decision regarding investments for each considered innovative project [5].

The main forms of technology transfer commercialization are:

– sale of technology in a materialized form: automatic and electronic equipment, technological lines, etc.;

– direct investments and accompanying documentation in the construction, reconstruction, modernization of enterprises, firms, industries;

– portfolio investments, including joint ventures, as well as leasing;

– sale of patents;

– sale of licenses for all types of patented industrial property, except for trademarks, service marks, etc.;

– sale of licenses for non-patented types of industrial property: know-how, production secrets, technological experience, instructions, drawings, diagrams, specifications, technological maps, as well as training of specialists, consulting support, expertise, etc.;

– joint implementation of the R&D, scientific and industrial cooperation;

– engineering and reengineering [6].

Engineering is aimed at obtaining the best results from investments in the implementation of projects through the achievements of science. Through engineering, projects can be shortened, investments can be reduced, production costs per unit can be reduced, and investment efficiency can be improved. Engineering has a close relationship with science, which consists in a single process of creating, testing and implementing technical and technological achievements, advanced solutions and developments. Science learns, generates new ideas and solutions, and engineering brings them to practical use [7].

That is, the role and importance of engineering companies in technology transfer within the framework of IIP is becoming increasingly important due to the functions they perform.

In the world, there are certain regulatory documents on engineering services in various industries that Ukrainian enterprises should take into account, for example, the "Guidelines for the use of engineering services" developed by the American Society of Civil Engineers (ASCE). In addition, the United Nations Economic Commission for Europe, a little later, also developed a "Guidelines for the drafting of international agreements on consulting engineering", in which it defined the various types of engineering. A large amount of work on the unification of engineering was carried out under the auspices of the World Bank and the European Bank for

Reconstruction and Development, which made it possible to formulate a unified approach to justifying investments and making decisions based on engineering developments, taking into account economic and social factors [8].

As functions of engineering as a scientific approach to solving practical problems, the following functions can be distinguished:

1. Research. The study of mathematical and general scientific methods, means and concepts, experiments and logical tools for the initial study of problems, the search for the latest principles and actions.

2. Development. Application of research results for practical purposes, creative use of scientific knowledge to create new models in various subject areas – technological processes, production equipment and enterprises in general.

3. Design. Detailed (working) design of a product or production system, definition of methods and processes of production and operation, determination of the materials used, decision-making on the form and structure of a product or system, determination of the technical characteristics and functions necessary to solve a problem, ensuring compliance with requirements and satisfying needs and expectations.

4. Costing, Budgeting & Financing. This function involves the development of budgets and estimates for the project, the preparation and holding of competitions, as well as the creation of new financial instruments and operational schemes.

5. Construction. The creation of the material infrastructure necessary for the implementation of the designed processes, in the general case, involves the development of a construction site, the creation of construction products, i.e. passive fixed assets, organization of quality control and preparation of project products for operation.

6. Production. Determination of the layout of production processes, selection and purchase of the necessary equipment, determination of materials, raw materials, components necessary for production, and sources of their supply, integration of all production processes, testing, commissioning and inspections, personnel training, organization of pilot production.

7. Operation. Control over the functioning of machines, processes, factories and plants, organization of material and energy support, organization of transport and communications, determination of procedures for the implementation of technological processes and their improvement, control over the activities of personnel, development of skills and abilities of personnel in the implementation of technological processes, quality management of processes and products [7].

The engineering company "SR LTD" – is an official **partner of Siemens Ukraine** (wholly-owned subsidiary of Siemens AG, Germany) of Department "Industry Automation & Drive Technologies" (IA&DT). The company is engaged in the supply, engineering, commissioning and maintenance of industrial electrical equipment, and has extensive experience in practical work. Employees have been working with Siemens equipment since 1985 [2].

That is, such firms take part in all stages of innovation activity and unite an enterprise-developer of innovative technologies and an enterprise-consumer, which, in fact, orders an innovative project and introduces certain innovative technologies.

Thus, the commercial potential of IIP should be considered from two sides: from the side of the company creating innovation and from the side of the consumer enterprise. Let's consider this issue using the example of Siemens and its representative office in Ukraine, a subsidiary of Siemens-Ukraine, and their system integrator, SR LTD.

So, Siemens Corporation has developed an innovative technology "SIMATIC System Audit" as part of the provision of industrial services for enterprises [10]. This technology improves the availability of systems through detailed information about the state of the equipment.

The main requirements of the SIMATIC automation system are to ensure maximum productivity and efficiency of equipment throughout the entire life cycle, including in the face of increasing equipment complexity and increasing cost pressure. As a result, the importance of the availability and serviceability of automated systems to ensure the productivity of equipment is increasing. For perfect coordination of products, systems and services, detailed information about the condition of the equipment is essential. The SIMATIC system audit comes to the rescue, providing the necessary basis for the conceptual design of maintenance strategies, effective equipment modifications and lifetime maintenance. Over time, many manufacturing plants need to adapt to new conditions, expand or modernize for various reasons. Such interventions in the original equipment and automation concept affect all system components and can interrupt the production process due to undefined systems. The reasons for these violations may be, for example, different procedures used by third-party service providers or the lack of systematic maintenance of the automation system. The SIMATIC system audit provides complete transparency on the current status and health of the SIMATIC automation system in use. System audit should be applied even in the absence of current problems, as it will be the basis for determining future service strategies and awarding a lifetime service contract. SIMATIC Lifetime Maintenance from

Siemens optimizes the availability and maintainability of systems and plants. A comprehensive set of services covers the entire life cycle – from planning and development to operation and modernization. The perfect coordination of these services with SIMATIC automation products and systems plays a decisive role in protecting investments and ensuring the efficiency of customer systems and installations [10].

In a transfer, the developer of the IIP, Siemens Corporation, transfers the developed technology to a licensee, an enterprise that consumes the technology. Engineering companies can take on not only the development of the project and its implementation, but also the promotion of technology in terms of the formation of a marketing mix, that is, the commercial potential of an innovative technology directly depends on the Marketing activities of an engineering company.

Conclusions

Using the example of the innovative technology proposed by Siemens Corporation, we will consider the problems and possibilities for overcoming them due to the role of an engineering company. Features of the analysis of demand for technology and the creation of an information base for its implementation are specific in each case. So, based on the experience of cooperation between the Firm "SR LTD" with leading large industrial enterprises, it can be concluded that the innovative technology "SIMATIC System Audit" has not yet won supporters of its implementation in domestic enterprises.

So, what is the reason for this and how an engineering company can help increase the commercial potential of the technology is given below.

1. Lack of awareness of consumer enterprises regarding the quality of technology, design features and properties, as well as compliance with state industry standards, significantly reduces demand. After all, the role of engineering companies here can hardly be overestimated. So, the system integrator of the company, in our study, is the SR LTD Firm, which is able to provide all the comprehensive information about the properties of the technology, in addition, it can adapt it to the real state of the customer enterprise, using certain modules and gradually increasing the capabilities of the technology. This allows the consumer to invest in stages and be convinced of the capabilities and effectiveness of the technology.

2. The factor that significantly slows down the demand for Simatic technology and the speed of its distribution is the high price. Indeed, in the realities of Ukraine, the introduction of such technology requires the search for very powerful investors. The engineering company, thanks to the Costing, Budgeting & Financing function,

is able to increase the investment attractiveness of the project, in addition, the reputation of the engineering company plays an important role for the investor, which further increases trust in cooperation with all project participants.

3. The high technical level of the enterprise-developer, unfortunately, does not correspond to the technical level of domestic enterprises-customers of the technology, which automatically entails the need for an accelerated transition to a qualitatively new level of production of Ukrainian enterprises. It is engineering companies that, in the future, ensure the acceleration of the introduction of fundamentally new technologies and stimulate the emergence of demand for them from customer enterprises.

4. The introduction of a lead strategy used by Siemens requires the formation of demand to enter a new segment. Engineering companies, thanks to close cooperation with a large number of enterprises in various sectors of the country's economy, are able to influence the formation of demand in a certain way through their communication policy, which is embodied in participation in conferences, exhibitions, industry meetings, etc. They convey certain ideas to industrialists, thereby increasing the dissemination of information on innovative technology.

5. The transnational level of the industry (firm) has a stimulating effect on the demand for technology. Thus, Siemens-Ukraine and the system integrator Firm SR LTD carry out external integration, which allows attracting more customers to the new technology, accelerates its distribution and increases the demand for it.

6. In order for a technology to be accepted by the market, and therefore to generate demand for it, it is essential to select the most reputable buyer who creates an authoritative opinion about this technology. Such a marketing strategy is called a "strategy of the luminary." Moreover, the first buyers enjoy preferential terms of purchase, helping their authorities to increase demand for new technology [6]. An engineering company is looking for just such a buyer, which is also interested in providing its services.

7. Engineering companies carry out segmentation of the technology market, help to make a choice of a market segment, contribute not only to the targeted formation of demand, but also to the manufacturer taking into account its specifics inherent in a particular consumer enterprise (industry, etc.), the formation of the price level.

Thus, it can be noted that the role and importance of the activities of engineering companies in all of the above aspects, as a result, significantly increase the investment attractiveness and increase the commercial potential of innovative technology of innovative investment projects at domestic enterprises.

The direction of further research is to identify specific marketing tools, through which it is possible to further increase the commercial potential of innovations.

References

1. Usov M.A., Havrys O.O., Suslikov S.V. Investment attractiveness of innovative projects. Priazovsky economic bulletin. Vol. 2(13), 2019.
2. Bushuiev K. Theoretical and methodological foundations for assessing and selecting the selection of investment decisions by means of neural networks. "Problems of legal, financial and economic support for the development of the national economy": monograph / edited by L. Savchuk, L. Bandorina. Dnipro: Porohy, 2021. P.108–158.
3. Kamianska O.V., Chikina O. Determining the commercial potential of intellectual property objects. Problems of a systemic approach to the economy enterprises. Vol. 4 No. 12, 2009. https://jrnl.nau.edu.ua/index.php/EPSAE/article/view/4518
4. Bushuiev K.M., Savchuk L.M., Fonarova T.A. On the issue of intellectual property valuation in the context of investment decisions. Financial and economic problems of the development of business entities during the formation of an innovative economy: a collection of scientific papers of the All-Ukrainian Scientific and Practical Conference, Part 2, 10.10.2022, Kryvyi Rih: Kryvyi Rih National University, 2022. 713 p. P. 511–516.
5. Petrenko V., Fonarova T, Bushuiev K. Modern aspects of investment and approaches to its assessment. Intelligent computer-integrated information technology in project and program management [Text]: Collective monograph edited by I. Linde, I. Chumachenko, V. Timofeyev. Riga: ISMA, 2020. 324 p. P. 225–240.
6. Petrenko V., Fonarova T., Ustinov A., Bushuiev K. Technology transfer as a tool for managing competitiveness in intellectual entrepreneurship. Proceedings of the XVIIth International Scientific and Practical Conference "Project Management in the Development of Society: "Project Management in the Context of the COVID-19 Pandemic"" 15.05.2021. Kyiv: Kyiv National University of Construction and Architecture, 2021.
7. Tuhai O.A., Vlasenko T.V. General principles of engineering activity and its state in Ukraine. New technologies in construction. № 34, 2018.
8. Bushuiev M. Research of the market of engineering services. Young Academy – 2023. Collection of abstracts of reports of the All-Ukrainian scientific and technical conference of students and young scientists. Dnipro, Ukrainian State University of Science and Technologies, 2023. 216 p. P. 110.
9. SR LTD is an official partner of Siemens Ukraine (Subsidiary with 100% foreign investment of Siemens AG, Germany). Official site http://sr-ltd.com.ua/
10. Siemens "SIMATIC System Audit" https://assets.new.siemens.com/siemens/assets/api/uuid:08af5eb1a57bb3455634301c40516028cc98bc49/simatic-system-audit-ru.pdf