



15th International scientific conference “Underground Urbanisation as a Prerequisite for Sustainable Development”

Management of investment strategy and innovation in underground construction

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Abstract

This article discusses the principles of investment management from the perspective of cognitive modelirovaniyaIzuchaetsya question of investment attractiveness of underground construction. Some proposals have been designed to improve the corporate structure of the construction business based on the results of the pilot study and practical analysis.

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Peer-review under responsibility of the scientific committee of the 15th International scientific conference “Underground Urbanisation as a Prerequisite for Sustainable Development

Keywords: Cost management, investment project, cost estimation, budgeting, cost control, document support.

1. Introduction

The formation of a stable dynamic development of the construction industry of Russia is possible only on the basis of effective management of investment activities where a high probability of positive synergy effect. The problem of providing the right investment strategies, investor's work with contractors and local authorities at the present time is particularly acute. Especially in the aspect of innovation policy, improve the financial, economic and organizational-technological solutions in the field of construction.

The present study is devoted to the study of investment processes in the construction industry taking into account the innovation introduced in the system of investment management, and the industry itself. The aim of the research is the study of the investment process including innovations in the sector and making recommendations that promote a favorable investment climate and development of the industry. Particularly attention is paid to innovation in the

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field of underground construction and development of infrastructure facilities on the ground level of the building. The first task: to study aspects of the investment management in terms of innovative activities. The second task is to consider innovative underground construction in the aspect of investment attractiveness.

2. Analysis of publications

Investment management problem in the construction industry is very relevant today. It examined many scientists. In the O.A Pobegaylov and O.V Klyuchnikova [12] referred to the close relationship with the investment policy of the organization and management of construction, the use of traffic management techniques, including linearly extended objects of underground construction. L.K Petrenko, S.E Manzhilevskaya and D.A Bogomazyuk [18] consider the problem of innovation in construction technologies and investments in the sector, taking into account the implemented innovations of this type. O.A.Pobegaylov, O.E.Gaybaryan, G.I.Myasishev [19] and talk about the role of document and information management companies when choosing an investor-customer organization - contractor.

Works L.E.Basovsky [1], I.A. Blank [6], G.Z.Gabidullinoy [8], T.S. Kolmykova [11] and others reveal the very essence of the modern concepts of investment and investment mechanism in the conditions of modern economic development. The research A. I. Fazrahmanova [9], I.L.Leonteva [13], E.B.Nikolenko [16,17] study questions the effectiveness of different types investitsionnoy policy, investment management, the expected effect of the introduction of a mechanism for investments.

American scientist P. Bernstay [7] presents a generalized theory of economic sectors depending on the choice of investment strategy.

Questions of innovation policy podrobno studied A.V. Babanov [3-5] - he produced several scientific papers on this issue.

Thus, summarizing the material studied and their own research in this area, the authors of this article point out the objective need for solving the problem.

3. Investment management strategy, taking into account the uncertainties in the aspect of innovation in construction

The authors suggest that the primary condition for the effective use of instruments of investment management is to develop a defensible investment strategy based on multidimensional complex analysis of the object of prospective investments. In this regard, it becomes clear that innovation, in fact, is the only area of investment of investment resources, contributing to obtaining a stable income and have a synergistic effect.

The management structure of the investment strategy of the enterprise is based on the pattern of interaction between the production and operational processes. It should be clearly defined functions, powers and responsibilities of all parties in the field of development and improvement of the investment, taking into account the probability of risks and uncertainties of modern construction [10].

The development of the investment and construction of the complex in the modern reality is inhibited permanent economic crisis and the instability that affects the investment opportunities in the construction industry on the innovative development of the construction industry, on the potential of the modernization construction as a whole. This is especially true of capital-intensive projects of underground construction. From the lack of interest on the part of investors to suffer and large objects, such as subways, and limited such as underground levels multipurpose buildings.

You have to understand that investing in the project, not involving the use of modern technology in itself threatens loss of commercial benefit or cost overruns associated with the imperfections and technologies. Thus, modern investors are faced with a difficult choice of investment risk: innovative projects or possible losses due to technological backwardness [1,2].

The lack of a reliable system of evaluation of the project organizational and technological reliability and attractiveness difficult to determine the investment policy, a negative impact on the market and on the development of the construction industry.

Quality of work, compliance with technical regulations to modern standards, the accident at the facilities, health and safety, economic efficiency, etc. - The main criteria for assessing the reliability of the investment remain unchanged, but the realistic incarnation still far from clearly verifiable limits.

In fact, the assessment of the reliability of each project currently requires building a complete model of its execution, taking into account all factors of instability. Then this model is attached real work, which in turn are influenced by the set of unaccounted factors: the elementary negligence performers to change the primary legislation and licensing policy in the industry [3,4].

The paradox discrepancy model and the real state of affairs in the Russian conditions is solved by adjusting the parameters of the production cost factors and terms of works execution in order to keep at least a semblance of economic efficiency, and for further investment. As a result, the quality and safety of works is sharply reduced, going beyond the acceptable results [5,6,7].

Risks associated with the underground works are so high that investors, which could materially affect the development of the industry, do not consider justified the risks. Therefore, projects of improvement and expansion of underground infrastructure significantly inhibited even in the presence of scientific projects developed.

The authors suggest that this is precisely the error of the approach to the whole of the investment policy, organizational and technological control and management in the construction industry [13].

It is a fair assessment of investment risk based on the likelihood of project implementation model should be based on specific data for each runtime project. Reliable modeling of the project, its cost-effectiveness in the face of uncertainty is not possible without this source across organizational and technological and economic policy of the company [7,8]. Before developing the investment strategy must be to create a single information and procedural framework allowing both to accumulate information on the project, the customer (if it is not an investor), contractor, sub-contractors, as well as all the decisions taken and implemented in the mode of operational availability [9,10].

This will determine not only the reality of the situation in a particular company, but also to determine the development strategy of the project, and the degree of tolerance settings, the type of applied innovation and the degree of risk of their use [15].

Such analytical cluster will undoubtedly cause some concern image nature related to the concept of trade secrets.

It should be noted that these concerns can be resolved at the legislative level: the restriction of access by persons other than related to the estimation of investment attractiveness, their responsibility for the disclosure of information to third parties. In addition, compliance with regulations of the works, their quality, etc. criteria can not be regarded as information that could discredit the company, subject to fulfillment of legal requirements and construction technology. On the other hand, each company should be interested in the best presentation of their organizational and technological solutions in the field of construction, quality and reliability of work, particularly in the impact of uncertainties.

In order to avoid negative consequences, we propose to apply the method of cognitive modeling [4]. Cognitive modeling involves the study of data systems themselves, where does the initial information that allows the formalization of data sources and, accordingly, full verification of the entire structure is conceptualized from the data source to the finished project. Thus it achieved a considerable degree of relevance of the simulated system and simplify its handling, thus avoiding false innovation decisions related to the acceleration of production at the expense of quality and manufacturability or surrogate device desired investment model to a real production, when all the construction turns into an intuitive control system which functions more on based on self-organization and a sense of personal responsibility and professionalism of employees, rather than through a centralized intelligent control.

The main parameters that are traditionally considered in the implementation of the investment project are:

- regional prices for construction project of this type;
- the share of imported building materials and equipment, and their sources;
- production costs;
- tax policy;
- the level of penalties;
- the level of qualification of the management company;
- the competitiveness of the construction company;

- investment in construction;
- The program of labor protection;
- Research and development costs and the scientific support of the project and construction in general;
- the planned scope of work;
- the capital intensity of the construction company;
- the quality of construction products, objects in general;
- rate wages of the population in the region;
- information on the regulatory and legal environment - regional and national components.

The total investment in the construction industry characterizes the prospects for the development sector of the economy from the standpoint of possibility of realization of innovations, the vector of development. When you create a specific model should be clearly understood that the innovation can be associated with each of these fifteen aspects separately, and with all their totality.

The main difficulty in the preparation of the calculations in the model created is lack of information on some parameters, which main investor partners, as a rule, do not rush to give. In addition, the objective difficulty to oscillations in the field of regulation and legislation are observed in regions. It should be noted that the regional policy in relation to the construction business is not always a deliberate and though a little justified. Especially in the part of the executive regulations which the chaotic duplication and contradiction of executive instructions have become common place [20].

To implement the investment management strategy, the authors suggest a number of measures aimed at optimizing the organizational investment management system. Briefly control system can be represented in the Table 2

Table 1. Basic directions of formation and development of the investment policy of the management bodies in the field of construction industry.

Kind of activity	Tasks
1	2
Expert department	<ul style="list-style-type: none"> - Development of recommendations on the organization of interaction of participants of the investment process; - Development of procedures to ensure the reduction of terms and simplification of procedures for obtaining the necessary documentation governing venture capital investment; - Determination of priority directions of development of the region and market sector, and focus on them financially - investment resources; - Formation and the draft investment strategy, evaluation of the progress of implementation, evaluation of the interim results, preparation and consideration of proposals for the necessary adjustment of the investment strategy; - Preparation of recommendations for the development and improvement of tools State incentives and regulation of investment processes;

Expert department	<ul style="list-style-type: none"> - Evaluation of investment attractiveness of companies in the industry; - Formation of uniform requirements for innovation and performance criteria <p>investment projects implemented, taking into account the high-end technology</p> <p>innovative projects, the definition of forms of financing;</p> <ul style="list-style-type: none"> - A comprehensive assessment of progress in the implementation of innovation and investment projects, including failed and unrealized high-tech projects, with a detailed analysis of the causes of failure; - The formation, review and approval of the project investment plan, in addition to this, the preparation of clear and transparent rules of the adjustment plan.
Control executive department	<ul style="list-style-type: none"> - Ensuring interaction between all participants of the investment process, the creation and observance of favorable treatment when working with partners, by the executive authorities of the region, local authorities; - Fostering Team innovation and investment projects, consulting and other assistance for their implementation; - Promotion of investment opportunities and innovative projects in the region in the Russian Federation and abroad (including through trade fairs, exhibitions, conferences, forums, etc.).

Cognitive control model makes it possible to determine the development strategy and identify areas of cooperation with positive feedback. Proper construction cyclegramm entire investment cycle, based on the data sources and key factors of the parameters, shows the improvement of construction products where quality leads to increase [12]. Competitiveness of the company without the use of questionable decisions. It also allows you to determine the actual amount and timing of work, the need for reconstruction of the construction industry, the number of and the need for contractors and subcontractors in the performance of the project. In this case the factor of the crisis and the extent of its influence is taken into account objectively, not as a means of an extreme organization and management of the company on the market.

Control basic parameters shown in Table 2

Table 2. Basic directions of formation and development of the investment policy of the management bodies in the field of construction industry.

The main control parameters	Activity
Investment Strategy Management	<p>To identify the most significant parameters of the investment strategy, in particular:</p> <ul style="list-style-type: none"> - The territory of the direction of development of the region; - Time span of realization of investments; - Assessment of the most important qualitative and quantitative indicators of economic efficiency and resource maintenance of the facility or the system as a whole; - A system of strategic development goals; - Analysis of the competitive advantages of participants with respect to the investment attractiveness; - Performance criteria and the effectiveness of implementation of the investment strategy mode operational impact; - An action plan to ensure achievement of the goals of the investment strategy; - Principles of cooperation with the regional authorities and local governments; - The planned timing control execution of the investment strategy; - Determination of funding necessary for the implementation of the investment strategy.
Infrastructural maintenance of an investment policy	<p>Include elements of the infrastructure investment to ensure the system high-end technology innovations:</p> <ul style="list-style-type: none"> - Investment funds; - Guarantee funds; <p>From the perspective of the contractor:</p> <ul style="list-style-type: none"> - Industrial sites, provided the necessary infrastructure; - Cluster development centers; - Technology transfer centers; - Industrial and technological parks; - Financial and other institutions of innovation and investment development.

4. Innovative underground construction in the aspect of investment attractiveness

Among the priority tasks facing the region is determined by the construction of a sufficient number of sports facilities and playgrounds, garages and car parks, the use of a relief device for underground service facilities. These processes are relatively slow and are invested mainly by governmental and regional programs [1].

The main type of underground facilities are garages and utilities, less storage space. Development of underground commercial and industrial, logistics, transport and energy systems is in its infancy. Often these structures, in principle, be understood as unprofitable.

The widespread introduction of innovation, which is so wary investors, delivers real cost-effectiveness and full operational load object.

Thus, the analysis of the functioning of modern underground facilities in the Moscow region shows that nearly a third of them are used with minimal impact. Mainly used subways, underpasses, some of the storage facilities. Multipurpose facilities neekspluatiruyutsya almost never built, and giving the versatility to existing underground structures reduced to their dubious and temporary accommodation.

Almost the only way to profit from the underground objects directly remains of their lease of a commercial and other activities, which, naturally, can not be efficiently and safely.

Lack of experience and, apparently, the desire to manage these objects in terms of their economic efficiency slows down the process of development and produce real profits [9].

Analysis of international experience shows that the multifunctional underground complex for 31 kinds of different events, each of which could bring some profit operating company and, as a consequence, become the basis for investment and construction of this object. At the same time, these objects are the security risks at the level of similar structures above ground and reduced to the integrity of the construction and the use of modern technology, which involves the widespread introduction of innovation [17].

It is obvious that the creation of building complexes underground levels multipurpose facilities will, firstly, to solve the problem of shortage areas occupied by other pressing needs, and secondly, to ensure the integration of this area of social and cultural needs of the person in the multipurpose facility construction.

5. Conclusions

Modern investment management cannot function effectively in the absence of relevant information and communication support. The most rational method of management of the investment strategy is cognitive control method. In order to effectively invest in the construction requires the use of innovation.

Underground work - one of the innovative activities that can attract investment. It should be an integrated approach to the management of investments in the construction of underground facilities, then the risks are minimal and the profit is maximized.

References

- [1] L.E. Basovskii, E.N. Basovskaya, Economic evaluation of investments, INFRA-M, Moscow, 2008.
- [2] A.V. Babanov, Classification of factors shaping the investment attractiveness of the region, "Economic Journal", Russian State Humanitarian University. 4(28) (2012) 107-114.
- [3] A.V. Babanov, Innovation as a means of increasing the investment attractiveness of regions of the Russian Federation, "Economics, Statistics and Informatics», Bulletin of the EMA. 2 (2012) 174-181.
- [4] A.V. Babanov, The dynamics of the development of sustainable investment climate in regions with unstable economies, ITKOR, Moscow, 2011.
- [5] A.V. Babanov, Cyclic backwardness in infrastructure investment in the regions, Economic and Legal. Magazine "Business-in-law". 3 (2011)
- [6] I.A. Blank, Fundamentals of Financial Management, V.2, Nika-Tsentr, Krasnodar, 1999.
- [7] P. Bernstein, Against the Gods, Taming Risk, Business Olympus, Moscow, 2006.
- [8] G.Z. Gabidullina, Model-methodological tools justify socially-oriented investment solutions for power utilities: Abstract. Dis. ... Cand. ehkon. Sciences, Ufa, 2013.
- [9] A.I. Fazrahmanova, Evaluating the effectiveness of the formation and implementation of the investment policy of the enterprise: Abstract. Dis. ... Cand. ehkon. Sciences, Ufa, 2013.
- [10] A.F. Wall, R.P. Keeling, Horizontal and Vertical structures: The dynamics of organization in higher education, Liberal Education. 4(93) (2007) 22-31.
- [11] T.S. Kolmykova, Investment analysis, INFRA-M, Moscow, 2009.
- [12] O.V. Kliuchnikova, O.A. Pobegaylov, Rationalization of Strategic Management Principles as a Tool to Improve a Construction Company Services, Procedia Engineering. 150 (2016) 2168 – 2172.
- [13] I.L. Leontiev, Modeling innovation and investment development of socially significant objects on the territory: Abstract. Dis. ... Dr. ehkon. Sciences, Ekaterinburg, 2013.
- [14] P. Masse, Optimal investment decisions. Englewood, Cliffs, N.J., 1962.
- [15] E.B. Nikolenko, Organizational-economic mechanism of investment support of R & D: dis. ... Cand. ehkon. Sciences, Ufa, 2012.
- [16] E.B. Nikolenko, Organizational-economic mechanism of investment support of R & D: Abstract. Dis. ... Cand. ehkon. Sciences, Ufa, 2012.
- [17] L.K. Petrenko, S.E. Manzhilevskaya, D.O. Bogomazyuk, Mathematical Simulation of SiO₂ Leaching from Silicified Soils: Innovative Approach, Procedia Engineering. 150 (2016) 2302 - 2307
- [18] O.A. Pobegaylova, G.I. Myasishcheva, O.E. Gaybarian, Organization and Management Efficiency Assessment in the Aspect of Linguistic Communication and Professional Text, Procedia Engineering. 150 (2016) 2173-2177
- [19] E. Miller, Zvi-Bodie. Investments Translated from English, JSC "Olympus-Business", Moscow, 2013.