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The economics of innovative startups in construction: a methodology for selecting startups to be financed by a corporate venture fund

The article addresses the future of the task of developing a diversified innovative economy in Russia by means of drawing the attention of the state (as evidenced by the establishment of numerous funds, accelerators, and business angels), Russian and foreign private investors to the venture business activity. In our country, the venture industry is at its inception, but its core players are already in place: they are Russian and foreign venture capital funds, associations of business angels, corporate venture funds, public-private venture funds and the "fund of funds" (the Russian venture company). The intensity of the venture capital investment activity is low, and there is no state support system available. Financial transformations can decelerate the slow formation of the venture industry if there is no awareness of the importance of this activity for the development of the economy of the Russian Federation. At the same time, the availability of a significant amount of innovative research, needed for commercialization, creates the need for venture financing and the future change of the venture industry. High-quality management of venture investments can be implemented within the framework of a consolidated method: investment; control; formation and increase of importance for owners, institutional investors and society.

At the same time, the examination of the investments, that have already been made, contributes to the development of certain knowledge, skills, avoidance of fatal mistakes in the selection of projects, conclusion of agreements and management of companies.

The conference speakers addressed the most relevant issues of construction cost examinations which are essential when the cadastral value of real estate facilities is contested in court and when causes, conditions, circumstances and the mechanism of accidents, failures, and casualties in the course of construction and operation of construction facilities are identified. Hence, the most relevant problems of forensic structural engineering and construction cost examinations were considered, and the most effective solutions were developed.

Keywords: *digital innovative solutions, venture business, innovative developments, investment management*

The formation of venture financing in Russia, the dynamic phase of which dates back to the early 2010s and the beginning of the present decade, has resulted in a situation where venture funds are mainly established at the expense of the state budget and with the proactive involvement of state development institutions, namely the "Russian Venture Company" (RVC), as well as private venture investments, although there is a need for the venture funds to be established by large corporations. Foreign researches have proven the fact that corporations, analyzing their innovative progress as an inseparable component of their business activity and applying various relevant theories for this purpose (the "open innovation" model, the "design thinking" model, and others), have long been focused on the establishment of their own venture funds (the first ones appeared half a century ago). And the companies on the Russian construction market are no exception. We can address the cases of large development companies as GC PIK, MR Group, GC Osnova, and others. As of 2018, corporate investments in Europe reached 11...14 % of the total share of venture investments, while there were more than 15,500 corporate venture capital programmes¹. As a matter of clarification, about 35 % of the world's largest corporations, that are on the Fortune 500 list, have their own corporate

venture funds. Up to 55 % of the largest companies in Europe and 70 % of US companies contribute funds to corporate venture programmes. Such global brands as General Electric, Philips, Microsoft, BMW Group maintain their own venture funds. At the moment, large Russian holding companies are also trying to follow their example (Promsvyazbank, AFK Sistema, Gazprom, and others). The interest in this topic, together with the lack of expertise in this sector in Russia, led to the launch of the programme "The practice of Forming Corporate Venture Funds at Russian Companies" in 2018. The purpose of the programme is to increase motivation and encourage large holding companies to establish their proprietary venture funds, increase core competencies and skills of their employees in the corporate venture investment sector².

Parameters for evaluating startups in the construction industry. Analysts advise using certain norms as startup evaluation parameters³: 1) revenue dynamics, revenue-to-expenses ratio, raised investments, number of patents or patent applications (except trademark patents), these data are requested directly from rating residents; projects that do not submit the initial data are excluded from the

¹ Rusbase Company. URL: <http://rusbase.com/news/5facts-cvc/>

² Club of Directors for Science and Innovation. URL: <http://ird-club.ru/activity/vent>

³ Top-50 Russian venture startups. Secret of the firm. Kommersant.ru — 2013. URL: <http://www.kommersant.ru/doc/2266343>

study; 2) uniqueness (the number of competing startups in this sector) is calculated on the basis of the number of initial participating projects across market sectors; 3) market development strategies by the beginning of the next year to be selected by the experts of investment funds. Further, values of all coefficients go up by matching them with the maximum value. The final parameter is analyzed for each startup by summing indexes for each of the indicators, and a rating is made on the basis of this parameter (Table).

It is necessary to rely on the main assessment tools for understanding the pre-investment value to set up a corporate venture fund in the construction industry⁴.

The Berkus method. This is the principal effective way of evaluating a product. The Berkus method is applicable, if the pre-investment cost does not exceed \$ 2 million; this requirement perfectly complies with requirements for construction startups due to costly innovative solutions in the construction sector. The Berkus method is used for startups that are not profitable yet.

The method of summation of risk factors or the SFR method. This is a more progressive modification of the Berkus method. It requires to determine the initial price as a weighted average parameter for similar results across the construction sector. Risk factors are estimated in multiples of \$ 300,000; above \$ 600,000 for a very low risk and below 400,000 for a very high risk. Here is an example of the Trace Air product and its competitors in the Russian market. In this situation, the most problematic thing, as in many assessment tools, is to generate up-to-date data for similar products. The SFR method is used for startups that are not yet integrating profits.

The method of comparable operations. For the specified methodology, it should first of all be necessary to develop a metric that will acceptably demonstrate the product price. This may be a non-classical metric for the sector in which the product is formed: MRR is the constant monthly income (SaaS), the number of specialists (recruitment agencies), the number of retail outlets (retail), the patent fund (construction), WAU as the number of active customers per week (messengers), etc. In most cases, information extracted from profit and loss statements should be used, including sales, gross profit, EBITDA. The method of comparable operations is used both for startups that are not yet making a profit, and for those who are profitable. It can also be applied to startups in the construction sector, since all core parameters correspond to the construction and innovation sector of the economy.

The balance sheet value demonstrates the net value of the company, i.e. the material balances of the product. The balance sheet value method is difficult to use in relation to startups, due to the fact that it is based on the price of tangible assets of a holding company, whereas most startups own intangible assets, such as research mechanisms in a biotech startup, a user registry and integrated software in an Internet startup, etc. It is also relevant for the market of construction innovations, since the assets of startups are of great importance if compared to the production capacities of large Russian corporations.

The discounted cash flow method. Provided that the product functions correctly and generates certain revenues every year, it can be noted that the relevant product cost is an integrated amount of all projected cash flows for the subsequent years, if the construction startup will be well-demanded with account taken of the features of its operation.

The principal startup evaluation methods

The evaluation method	Indicator level
Principle	From 10...50 % From 50...100 %
The Berkus method	The assessment is based on 5 main success factors
The method of summation of risk factors	The assessment is based on the base cost, based on 10 classical reasons for risk
The scoring method	The estimate is based on the weighted average parameter of the cost selected for the target company
The method of comparable operations	The evaluation is conducted using a triple rule with a KPI applied to a similar company
The balance sheet value method	The assessment is made using the value of tangible assets of a corporation
The liquidation value method	The valuation is based on the liquidation price of tangible assets
The discounted cash flow method	The estimate is based on the totality of all potential cash flows to be generated
The first Chicago method	The assessment is conducted using the weighted average analysis of three scenarios
The venture capital method	The valuation is based on the return on investment projected by investors

The First Chicago Method. The first Chicago method generates revenues by analyzing three predictable scenarios: the lowest profitability scenario, the average profitability scenario, the highest profitability scenario. This is a classical method that can also be applied to the construction sector of startups.

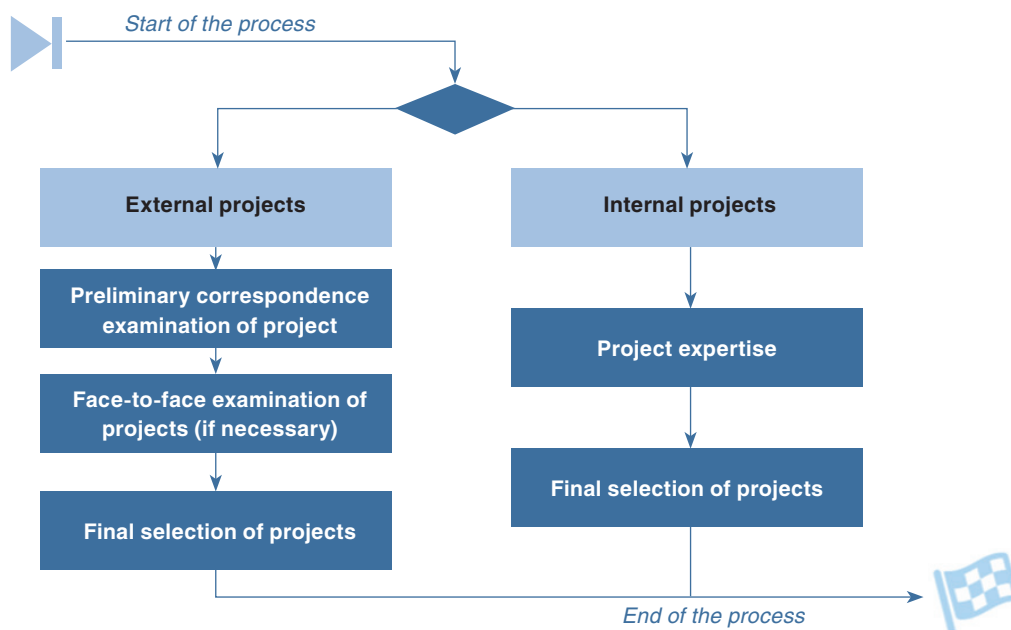
The venture capital method. At any moment of the product implementation, the investor has the opportunity to identify the required level of return on investment (ROI). The venture capital method is generated both for startups that are not yet making a profit, and for profit makers (Fig.).

Selection of projects for participation in the corporate accelerator (a corporate venture fund). The procedures for selecting participants of a corporate accelerator differ for external and internal projects⁵.

The procedure for selecting construction projects by stages and the class is similar to the process developed in the form of business accelerators, and it includes 3 stages: the implementation of the off-site examination of projects, the implementation of face-to-face examination of projects, and final selection. The requirements applied in the process of selecting projects for the corporate accelerator differ from those used in the business accelerator. It depends on the difference between the business models of business accelerators and corporate accelerators. The corporate accelerator of a development company, when selecting projects, uses both parameters that are applied when selecting projects for a business accelerator (for example, the correspondence between the product

⁴ The main methods of evaluating startups. URL: <https://www.iidf.ru/media/articles/money/9-metodov-otsenki-startapa-s-kommentariyamif>

⁵ Research of the world and Russian experience in the development of corporate accelerators. URL: https://www.rvc.ru/upload/iblock/dfd/o2_rvc_accl_otchet.pdf



Description of the business process "Selection of projects for participation in the corporate accelerator"

vector to the technology focus of the accelerator in the construction industry; the availability and capacity of the market for the generated idea; the chances of commercialization of the proposed idea; the project development stage), as well as the secondary parameters, used to assess to what extent the idea generated by the participants of a construction startup is suitable for solving the task of a development company, whether startup participants have the opportunity to interact with a construction corporation, whether a synergistic effect can be triggered with the help of the company in respect of the generation of the technology proposed by the participant. The control over internal products, as a rule, is executed pursuant to a well-balanced procedure, which does not include the stage of face-to-face examination due to the lack of the need for a special procedure for evaluating the team, namely the involvement of the team in the project development and well-balanced cooperation with the development company.

To perform the selection, experts of a corporate accelerator within a development company often contract external analysts, having strong skills and expertise in the field of interaction with real estate startups (PropTech, Constech) and their establishment: members of teams of successful construction startups, consulting companies (the big four leading audit companies and venture funds (the largest Russian companies)⁶. To get the necessary experts involved, corporate accelerators can seek support from their partners (general designers, general contractors, external consultants).

The main criteria of successful selection of products and teams for the corporate accelerator of a development business company are:

- the availability of a consolidated product selection system, which includes the necessary register of parameters needed to assess the prospects for commercialization by construction startups that are at an early stage;
- the availability of partners who provide access to various

high-level experts in the construction sector and are able to perform a high-quality examination of innovative products in the construction sector.

The establishment of a corporate venture fund in the construction industry, namely, at development companies, can be implemented from the pattern of Build Up, an accelerator of technology startups, headquartered in Skolkovo, as well as the Internet Initiatives Development Fund (IIDF) [1]. The following relevant selection criteria can be identified, which are necessary for funds, accelerators, business angels in 2021⁷:

1. The team, its functionality and capabilities. It is important that the skills of the founders complement each other.
2. How effectively the founders communicate, both within the team and with the outside world.
3. A strategic vision shared by all founders. If, when an offer to buy a startup is made, disagreements arise within the team, and one founder wants to sell the startup, while the other wants to continue its development, this situation means that such a vision does not exist.
4. A proof of the product's meeting the market expectations.

It is also possible to rely on methods of selection criteria that will help funds to evaluate startup⁸:

Evaluation method 1: Comparison. The most optimal method is to determine the estimated cost of a construction startup by analyzing it in comparison with competitors in the construction market. The basic idea of this method is to evaluate a startup in comparison with other similar construction products. The comparison method allows to analyze startups, operating in the same sector and offering potentially similar construction services, and provides an overview of how their valuation compares with the

⁶ The Microsoft Startup Accelerator Program Opens for Business. URL: <https://news.microsoft.com/2007/10/03/the-microsoftstartup-accelerator-program-opens-for-business>

⁷ GOST R 57363–2016. Project management in construction. Activities of the project manager (technical customer).

⁸ SP 333.1325800.2017. Information modeling in construction. Rules for the formation of an information model of objects at various stages of the life cycle.

cost of the proposed startup. It enables to optimally use non-standard indicators, as well as classical coefficients of sales, gross revenues, EBITDA, and other values. The comparison method has the advantage that, depending on the parameter, it should be used both for initial and post-investment evaluation. In a successful case, when an assessment is made, it is necessary to add the available data about another product compared with the original one.

Assessment method 2: Compliance. This is a method of evaluation that is focused directly on the wishes of an investor. At this stage, an investor has specific investment wishes, and in the course of the selection process, he will choose construction startups that "meet" these specific parameters. If an investor wants to provide an amount of \$ 100 thousand to \$ 250 thousand to a construction startup and get about 10 % of the company's capital, it is necessary to select the products that meet certain requirements and at the same time can be part of a certain exit plan, which is absolutely necessary. This method of assessment is the least scientific of all seven methods. It is more about what it is more convenient for an investor to work with, rather than how much a startup actually costs. In fact, this method is not so much about a detailed analysis of each construction startup, as about finding those startups that will be able to achieve the investor's goals.

Valuation method 3: Discounted Cash Flow (DCF method).

The analysis of a real estate startup can be performed by projecting a specific cash flow. The idea of this mechanism is to look at a startup as an entity owning some other investment asset, namely, real estate. It is necessary to evaluate and discount the future cash flows of a construction startup in order to arrive at the current valuation. This method is not suitable for construction startups with any type of financial reporting. In addition, it is necessary to apply the projected cash flows and in the future discount them back to the present time to obtain an evaluation. This factor can be used at subsequent capital raising stages, when the startup has specific reliable financial indicators and higher predictability⁹.

Evaluation method 4: The Venture Capital Method. The application of the venture capital method is performed by the centralization of the three above-mentioned methods: comparison, matching (compliance) and cash flow. A comparison method is used to find out the selling value of a construction startup. Next, it is necessary to apply this assessment to move back and make an assessment that will meet the investor's goals. To understand how this method is implemented in practice, it is necessary to analyze it more carefully. In a situation when an investor intends to invest in a construction startup, the optimal exit time will come in three years. To move on to the current assessment, it is necessary to focus on the projected revenues of a particular construction startup in three years. At the next stage, it is necessary to take income, multiply it by the profitability coefficient and get the final cost (to know the amount for which a construction startup can actually be sold in three years at an IPO or through an industry sale) [2]. The investor (fund, accelerator, incubator) also needs to get repaid, and for this purpose, the Internal Rate of Return (Internal Rate of Return, IRR) is calculated. It can be 25 %, or the market value for startups in the construction sector.

⁹ GOST R 58439.1–2019. Organization of information about capital construction projects. Information management in construction using information modeling technology.

Evaluation method 5: De- or reconstruction. This methodology uses a straightforward approach to determine the value of a startup based on deconstruction or reconstruction of an enterprise. Deconstruction analyzes the liquidation of an enterprise, for example, in connection with bankruptcy. Deconstruction does not take into account the cost of a business idea or other similar intangible assets¹⁰. Reconstruction, on the other hand, approaches the assessment from the viewpoint of the leading assets of a startup and analyzes how much it will cost to reproduce them, that is, to perform the reconstruction of assets.

Evaluation method 6: Combination. This technique combines the value of various elements of a construction startup to identify its current cost. The method is close to the comparison method: 5 principal parameters are generated to launch a construction startup, and the startup is analyzed in comparison with similar startups in the construction sector. In fact, the potential cost of a construction startup is estimated by considering what other startups could do, if they had these specific elements [3].

The establishment of a corporate venture fund in the construction industry, let alone, in development sector, is still an understudied topic in our country, despite the fact that over the recent years leading Moscow development companies have been actively developing digital products, software, as well as partner digital products, when a development company integrates its solutions with a company that provides comprehensive artificial intelligence and cloud services.

It is important to develop a proper strategy for the selection and future interaction with the winning companies to design the way the company's product will be implemented in the operational management of development companies and general contractors.

Will it be aimed at improving the company's own business processes, such as the on-site construction monitoring? Will it improve the quality of the company's digital services or increase the percentage of involvement of artificial intelligence products in the operational business processes of companies?

An integrated macroeconomic environment, the transformation of customer requests, the need to reduce costs boost the demand for technology among development structures. At the same time, they themselves turn into startups by establishing their own IT departments and developing IT products. Development companies plan to independently automate business processes that have already been created, and they start looking for external products in those areas in which they have not worked before, where it is necessary to create a new business model from scratch (in particular, products for dynamic pricing or platforms that bring a developer together with the property technologies market players). At the same time, if low-tech products are generally popular in the West, in Russia it is a utopia, because developers need productive technologies that ultimately bring results [4].

Leading Russian development companies, when searching for startups and solutions, encounter several major complications: a lack of ready-made products on the market, problems with combining existing solutions: basic solutions are often not suitable, because most leading companies have their own business processes. At the same time, it is problematic to integrate several similar or complementary solutions.

¹⁰ GOST R 57363–2016/ Project management in construction. The activity of the project manager (technical customer).

► CONCLUSIONS

Based on the above, we can identify a number of proposals that should be taken into account by startups operating on the market of venture investments or planning to enter it and have equity in corporate venture funds:

1. Have more contacts with potential consumers, because most startups have insufficient sectoral experience and understanding of internal business processes of customers. One of the acceptable tools for solving this issue is an accelerator, that helps to better analyze customer requests, formulate a valuable proposition more clearly and improve the product.

2. It is not necessary to copy successful Western business models. The practice of using business models of foreign large companies, with regard for the local features of the industry, may not always be in demand and feasible in Russia.

3. It is necessary to pre-calculate the merger of a new product with existing/related products¹¹. Most development companies consider this as one of the main problems they encounter when looking for external ideas on the market.

4. The client needs not only a methodology, but also its application scenarios and certain measurable results of using a new solution (for example, cost optimization, a higher number of users).

5. If the user of the solution is a development company, it is better to focus automation solutions on the new business processes rather than the relevant ones. The following competitive niches

¹¹ GOST R 522922004. Information technology. Electronic exchange of information. Terms and definitions.

Экономика инновационных стартапов в строительстве: методика отбора для финансирования корпоративным венчурным фондом

В данной статье рассматривается будущая задача организации в России инновационной диверсифицированной экономики путем повышения внимания к венчурному бизнесу как со стороны государства (об этом свидетельствует создание многих фондов, акселераторов, бизнес-ангелов), так и со стороны российских и зарубежных частных инвесторов. Венчурная отрасль в нашей стране только начинает создаваться, но уже организованы и реализуются ее основные участники: российские и зарубежные венчурные фонды, ассоциации бизнес-ангелов, корпоративные венчурные фонды, государственно-частные венчурные фонды и «фонд фондов» (Российская венчурная компания). Динамика венчурного капитала происходит не спеша, а определенной системы государственной поддержки не сформировано. Финансовые трансформации могут тормозить и без того статичное формирование венчурной индустрии, если не будет сознания важности данной сферы для развития экономики Российской Федерации. Вместе с тем присутствие весомого количества инновационных исследований, нужных для коммерциализации, создает необходимость в венчурном финансировании и будущем изменении венчурной отрасли. Качественное управление венчурными инвестициями может быть реализовано в процессе совокупного метода: вложение; контроль; формирование и увеличение важности для владельцев, институциональных инвесторов и общества.

Вместе с тем экспертиза уже реализованных инвестиций способствует выработке определенных знаний, навыков, уклонению от фатальных ошибок при селекции проектов, заключению соглашений и руководству компаниями.

are of particular attention: products for improving the customer expertise and adding value for the client, ERP systems for real estate management during the entire life cycle, communication platforms for different market players, digital solutions in construction.

6. A solution should be as optimal as possible both from the standpoint of control (the "one button" principle), and from the standpoint of the customer's costs for its application and reconciliation with the present solutions.

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Ключевые слова: цифровые инновационные решения, венчурный бизнес, инновационные разработки, инвестиционное управление

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