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TECHNICAL ANALYSIS OF AN INVESTMENT PROJECT

N. Poddubny, 3 year

Academic advisor – **N. Bulanova**

Belarussian national technical university

Currently, Belarusian organizations are increasingly facing the need for changes in their structure, products, and management. This is primarily due to rapid changes in the market. Today, it is no longer enough to simply produce a product for it to be purchased. It is necessary to constantly refine and improve it, and to invent new ones. Competition in the Belarusian market is enormous, so one must always be better and faster than others. This trend indicates that it is necessary to create new projects.

A project is a time-limited and resource-limited (labor, financial, material) human activity aimed at achieving a specific result. The main difference between a project and any other organizational activity is that a project has a specific goal, tasks to achieve it, and once the goal is reached, the project ends; that is, it is not repetitive in nature [1]. Developing and creating a project is impossible without thorough analysis and the development of a detailed plan. Any plan for any project includes several key points, without which it is impossible to determine whether developing a specific idea makes sense.

Technical analysis is often the foundation, the base for the project and for other types of analysis. In the case of innovation invention, technical re-equipment, and other processes, the technical analysis of the project is paramount. It provides the answer to the question of whether the project is even feasible. Conducting technical analysis requires highly qualified engineers [2].

Thus, technical analysis is precisely the foundation in analyzing a project before its implementation. It is inextricably linked with other types of analysis, as other types obtain the initial project data from it.

Technical and financial analyses are directly linked. Thanks to the technical analysis, the financial analysis will have data on necessary long-term investments, i.e., the cost of equipment, design, resource costs, raw materials, energy, required number of workers, timelines, and much more. Technical analysis provides the financial analysis with a basis to easily calculate all necessary capital and operating costs for project implementation.

Technical analysis is also necessary for environmental analysis. It is necessary to understand which equipment, resources, and technologies will be used to implement the project, and only then assess their environmental friendliness.

Technical and commercial analyses are also interrelated. Firstly, before developing an idea and its technical analysis, data on market needs must be obtained. This is what commercial analysis does through marketing research. Secondly, after the creation and technical analysis of the idea, data for the commercial analysis is taken from the technical analysis.

The analysis above shows that technical analysis is inextricably linked with other types of analysis, and is also the first and key step in executing any project, as it deals with the issue of technical feasibility. Technical analysis is not chaotic; it has a clear plan and research directions, allowing for a thorough examination of the necessary idea from all sides [3].

First and foremost, after an idea emerges, it is necessary to evaluate the technology and production process by which it will be implemented. To do this, it is necessary to analyze the technologies available to the company and compare them: how productive and powerful they are, what quality they can provide, how costly it will be, whether it will be automated or require manual labor, and whether the project implementation will be safe. Then, it is necessary to describe all stages of the production process operation by operation to know point by point exactly what needs to be done and accurately determine the required amount of equipment. After that, the number of workers involved in the technological process is determined. Information about project safety can be used as a foundation for conducting the project's environmental analysis.

After conducting the initial engineering analysis and calculations, it is necessary to analyze the resource needs and capabilities of the organization. Since all the basic calculations have already been made, it is necessary to consider needs for materials, raw materials, energy resources (fuel, electricity), components, purchase of new equipment, and intellectual property.

Next, it is necessary to analyze the location of the organization where the project will be executed. Infrastructure plays the most significant role in this case, as developed infrastructure greatly simplifies obtaining necessary resources from outside. This analysis is necessary to determine required inventories and find suppliers. This stage is also important for calculating delivery times and creating a logistics chain. At this stage, a search is conducted for all necessary external resources identified in the previous stage.

In the final stage of the project's technical analysis, conclusions from all previous stages are presented. That is, technical and material supply, needs for labor and energy resources are determined, sources for these types of resources are provided, along with an assessment of the location where the project will be implemented. And most importantly, at this stage, a conclusion is formed about the technical feasibility of the project under the given conditions.

To conduct a technical analysis of a project, it is critically important to determine the tools that will be used and the methods by which the analysis will be performed. The main tools are blueprints and technical documentation. For a visual representation of the production process, drawings of technological processes and route-operational charts are often created. The main tools for creating technical project documentation currently are drawing programs such as AutoCAD or SolidWorks.

The IDEF0 methodology is often used to describe the production or execution process, allowing for graphical representation of processes and a clear demonstration of dependencies between them. Determining these dependencies is necessary because if problems are identified in later stages of project analysis, it will be clear which processes or even process connections need to be changed.

Network diagrams can be used for time and deadline planning in technical analysis. They can be used to determine the minimum project completion time and attempt to optimize it by reducing time on the critical path. This analysis is necessary to determine critical deadlines, consider the possibility of reducing them, and assess the dependence of various tasks on each other and on the completion time of previous tasks.

Currently, technical analysis is of immense importance for practically any investment project in Belarus. This is because when a superficial, dishonest technical analysis is conducted, or when it is ignored altogether, companies face great risks.

Besides leading to project delays and increased budget costs, companies face the risk of creating an unwanted product. During the technical analysis stage, all technical and engineering aspects of the project are examined, including its innovativeness. Without detailed technical analysis, the final result of the project may not meet market requirements in terms of characteristics or price factor. It may also become unwanted due to an unskilled calculation of the project timeline: due to drawn-out deadlines, the project may become irrelevant.

Technical analysis guarantees that the project is completed with quality. Consequently, without it, the project may have physical defects or be unstable. This can happen due to the choice of inappropriate technologies (outdated, irrelevant, or simply unsuitable), incorrect equipment (as it is very important to

calculate the accuracy and productivity of the means used before project execution), lack of adequate quality control at intermediate stages, and so on.

During the technical analysis stage, capital and operating costs for project implementation are calculated. Therefore, if this stage is skipped, there is a risk of ending up with an unprofitable project after its creation. Without technical analysis, the executors cannot adequately assess all project costs; thus, the actual costs will likely exceed the estimated ones, which may ultimately lead to the project not achieving the necessary level of profitability and simply not generating profit.

Beyond the main risks, without competent technical analysis, the project may also face technical barriers that could delay implementation or stop the project entirely, various emergency situations related to the technical part of project execution, or various legal problems when the project does not comply with legally established technical norms and Belarusian standards.

It is precisely to minimize all the listed problems and risks that it is extremely necessary to conduct a detailed and in-depth technical analysis of the project at the very first stage of its planning. Firstly, because thanks to this, other types of analysis can be carried out more accurately and easily later. Secondly, without competent technical analysis, the project may face a multitude of risks from many different sides.

Thus, the technical analysis of a project is of enormous importance for the execution of the entire project, creating a foundation of theoretical calculations, engineering drawings, analysis of fixed assets and costs, used subsequently at all stages of planning and implementation of the investment project.

References

1. Проектный анализ [Текст] : уч. Пособие / Рижиков В.С., Яковенко М.М. [и др.]. – Киев : Центр учебной литературы, 2014. – 384 с.
2. Технический анализ [Текст] / Кан М. – СПб : Издательство СПб, 2015. – 285 с.
3. Технический анализ от А до Я [Текст] / Стивен Б. – Москва : ИД, 2015. – 44 с.