INNOVATIVE TECHNOLOGIES AND THEIR IMPACT ON REDUCING TECHNICAL RISKS

Zalina Ibragimova[1], Naila Teplaya[2], Zulay Isakieva[3]

[1] Kadyrov Chechen State University, RUSSIA
[2]Moscow State University of Technology and Management, RUSSIA
[3]Chechen State Pedagogical University, RUSSIA
iibragimovazalina@mail.ru

Abstract

In this article, we will talk about technical risks, their nature of occurrence and their impact on the workflow. Modern technologies are constantly evolving, new devices and equipment are appearing, and the range of influence of computer technology is expanding. Scientific innovations make a huge contribution to the development in all spheres of society, old technical devices are being updated with new, more modern and multifunctional ones. The trend in the development of society, the desire to improve qualitative and quantitative indicators and minimize marriage allow us to speak about the relevance of the chosen topic. The use of modern devices makes it possible to use them more effectively in any field, increasing the parameters that favorably affect the growth of the economy, on which the development of both private companies and the state as a whole depends.

Keywords: technical risks, innovative technologies, computer technologies, digitalization, innovative risks

Innovative technologies play a big role in the modern world. The use of machine labor and computers can replace human labor in many industries, both physical and mental. The desire to improve performance and minimize risks forces manufacturers to purchase new equipment capable of performing a much larger list of functions than the previous one. Many different scientific papers have been carried out on this topic, thousands of studies have been conducted taking into account the effectiveness of the introduction of innovative technologies, which allows us to talk about the right approach in this direction.

So, technical risk is the probability of an event causing system malfunctions related to equipment malfunction, failures in technical infrastructure, reduced productivity, etc. Technical risks negatively affect the economic development of the company, its image, the quality of products, and also cause delays in the timing of orders.

There are many types of technical risks in the production and sale of products, we will discuss the most likely of them:

- Engineering errors. When planning a project, it is necessary to take into account many significant factors that affect both the performance of equipment and its high-quality performance. All these responsibilities fall on the shoulders of engineers, whose mistakes can significantly reduce the overall performance of the entire company.
- Defects in raw materials. This factor does not depend on the company that manufactures and sells products, but on the delivery company. The delivery of low–quality goods, the presence of defects in blanks, delays for various reasons - all this affects the number of products produced, compliance with deadlines and the image of the company as a whole.
- Manufacturing errors. When manufacturing goods, it is necessary to strictly follow the instructions, comply with safety requirements when working with hazardous production facilities and use the equipment for its intended purpose. To do this, it is necessary to competently

hire staff and train them to work with new devices that have not previously been used in the course of their activities.

- Sales of products. Most companies that produce products offer services for delivering goods to the buyer. There are two ways to hire employees yourself or use the delivery services of transport companies. For the first option, it is necessary to consider the terms of delivery so that during transportation the products are not damaged and spoiled, delivered to the buyer ready-made. The second option involves cooperation with other entrepreneurs or companies, when concluding a contract with which it is necessary to take into account the experience of its representatives, transportation conditions, well-chosen personnel and many other factors affecting the delivery of manufactured goods to the consumer.

There are many factors that negatively affect technical risks, let's talk about the main ones:

- Low level of scientific research. This type belongs to the criteria of production safety. The scientific technologies used do not meet the proper level of safety, which leads to negative consequences.
- Low level of development work. The choice of potentially dangerous design schemes and principles of operation of technical systems, errors in determining operational loads, incorrect choice of structural materials, insufficient margin of safety, lack of technical safety equipment in projects – all this increases the level of technical risks of production.
- Pilot production of new equipment. The use of outdated equipment or low-quality devices that have not been properly tested. Maintaining documentation of safety criteria and compliance with all requirements is also an important aspect of maintaining production.
- Serial production of unsafe equipment. A violation in the chemical composition of the products produced, inaccuracy in the proportions of the components used, inconsistency of the specified dimensions of the finished product, errors in choosing the temperature during production, violation of the instructions in the sequence of actions performed – all this leads to increased technical risks and reduced work efficiency.
- Violation of the rules of safe operation of technical systems. When using the equipment, it is necessary to observe all prescribed precautions – use the devices only in cases specified by the manufacturer, observe operating modes, do not overload or overheat the equipment, carry out professional repairs of damaged equipment and check its operability in a timely manner, adhere to safety measures during transportation and use of equipment, etc.
- Staff mistakes. Perhaps one of the most important reasons for the occurrence of technical risks is the incompetence of the people working behind the entrusted equipment. It is necessary to constantly improve the skills of personnel, conduct discourses and educational programs, and train them to work with new devices. Important are the personal qualities of workers – discipline, responsibility, stress tolerance, the ability to make quick right decisions in case of emergency situations, etc. It is necessary to pay due attention when applying for a position, take into account previous experience and characteristics from previous work.

In the context of digitalization of society, these problems can be solved using computer technologies used in the development and modeling of projects, improving and optimizing equipment, training personnel through video lectures, signing cooperation agreements and purchasing goods with other companies, placing orders through online resources and much more.

However, with the introduction of scientific technologies, a new problem appears – innovative risks, indicating the likelihood of losses when introducing innovative technologies. In other words, innovation risk is the consequences that an enterprise may face when introducing innovative technologies.

There are several types of innovative risks that can lead to a deterioration in the quality and quantity of manufactured products, here are some of them:

- Lack of financial resources. Lack of financing to achieve the company's goals – purchase of new raw materials, purchase of new modern equipment, maintenance and repair of damaged devices, and many other factors that cause lag and contribute to downtime in production.

- Underestimating marketing when planning a project. This type of risk may arise due to improper use of the budget, in which there will not be enough funds for good advertising of goods, which will lead to a large difference between the products produced and sold, will entail stagnation in production, and, as a result, losses to the company.
- Changing consumer needs and demands. The changing structure of the modern market significantly complicates the choice of manufactured products from the manufacturer, because the demand for the supplied goods can significantly decrease. The solution to this problem can be a constant analysis of supply and demand in the market, and in case of its decline, the opportunity to change the direction of production to other, more relevant and purchased goods.
- Lack of raw materials and materials used. With the introduction of new technologies, the production process changes significantly, especially in cases where completely new products are produced. To do this, it is necessary to correctly assess the available budget and use it to the maximum benefit. The manufacturer should think in advance about the suppliers from whom he will purchase materials, calculate how much and what kind of raw materials are needed for this type of product in order to avoid a shortage of one raw material and an excess of another.
- Data leakage within the company. The production of new products, especially new ones for the existing market, should always remain secret until the moment of product sale. In order to avoid disclosure of information, it is necessary to clearly identify the circle of people who may know about the planned deliveries. Otherwise, competitors are able to steal the idea and launch this industry into mass consumption faster, which can significantly reduce projected sales revenues and lead to losses for the company.
- Copyright of scientific technologies. When using new directions, it is necessary to make sure that these innovations do not have copyright. Otherwise, the owner may demand a percentage of the profit received, which will bring huge losses to the company.
- Delays in production dates. In fact, this species combines the first and fourth species mentioned above. All these factors negatively affect the entire production process, from the purchase of goods and creation to the delivery of the finished product to consumers. This can lead to delays and downtime, loss of clientele and investors, and loan arrears if creditors' money was used during the sale.

There are innovative risks at each stage of production – at the stage of project planning, purchasing new equipment and updating old equipment, using purchased equipment.

Consider the sources of innovation risk:

– financial (arise as a result of improper management of financial flows). They are divided into portfolio (the impact of macroeconomic indicators on the assets of enterprises), currency (changes in the exchange rate) and interest (changes in interest rates in the case of borrowing funds);

– insurance (related to the possibility of insured events);

– marketing (low-quality marketing research);

– commercial (losses arising in the process of selling goods or services, or in case of loss of profit);

– industrial (disruption of production from equipment failure to destruction of buildings);

– investment (the possibility of non-repayment of invested funds);

– political (the possibility of changing the socio-political situation);

– environmental (the likely onset of environmental degradation, which led to a deterioration in the quality of forest, water, land, air conditions, as well as a change in the life and health of third parties).

Based on the opinion of the author, E.G.Zakharenko identified such risks as:

1) external, risk-related effects of direct (suppliers, competitors, consumers, investors) and indirect (politics, economics, social sphere, ecology, force majeure) impacts on project performance;

2) internal, including resource and organizational-production (management and risks of interaction within project teams).

Innovation risks are closely related to economic risks. The main economic risks in the Russian Federation today include:

– the federal budget deficit;

– decrease in the volume of the reserve fund;

– a noticeable increase in the unemployment rate;

– decrease in the inflow of foreign investments into the Russian economy and the outflow of Russian investments abroad;

– a sharp drop in the exchange rate of the Russian ruble and the stock market caused by external factors.

Project risk analysis is an important part of the innovation planning process. It occupies one of the leading places along with goal setting, budget development, and approval of the project plan.

Of course, in order to avoid financial losses, it is necessary to try to reduce innovation risks. Here are some of the ways to minimize them:

– avoidance – rejection of projects with a high level of risk (this is typical for risk-averse investors who do not expect a high level of income from financial investments);

– localization – concentration of high-risk activities within one structural unit or territory (such a policy will protect other units from the consequences of the occurrence of a risky event);

– dissipation – distribution of risk in time and space;

– diversification – working in several markets, in different fields of activity, with different partners;

– reservation (formation of a reserve fund in case of failures in financing or losses during the implementation of an innovation);

– insurance (using the services of third–party insurance companies and choosing the most optimal insurance system) - risk distribution between performers and projects;

– diversification (dispersion) of risks for unrelated projects;

– hedging (reducing the risk of adverse (as a result of market factors) changes in the price or expected cash flow of one instrument by using another instrument associated with it as part of the project);

– limitation (introduction of a limit on expected project costs);

– transfer of risk to another person in case of exceeding the maximum acceptable value for the enterprise.

In order to avoid significant financial losses, insurance is used that can compensate for part of the losses incurred as a result of production. With the help of insurance, it becomes possible:

- To compensate for losses or lost profits. With an increase in the number of negative risk factors, the insurance company can return to the entrepreneur part of the funds spent on compensation for losses, which will help the production to survive the crisis more easily.
- Coverage of damage from possible negative events. This aspect refers to events that can lead to damage to property, equipment, finished products and other forms of ownership, compensation for the loss of which the insurance company is able to reimburse.
- Compensation for damage caused by a third party. In cases where the actions of other persons, both individuals and legal entities, have led to losses of the company, the insurance company can reimburse all losses of the organization.
- Compensation for investment losses. In the case when new technologies not only did not benefit, but also led to losses of the organization, the insurance company will help to recover the costs.

As we have already understood, insurance companies help entrepreneurs to use innovative technologies more safely when doing business, covering part of the costs in case of unsuccessful attempts at reorganization. This leads to an increase in the number of new developments in this area, increasing the economic development not only of an individual enterprise, but also of the

state economy as a whole. It is necessary to develop this institution, help firms use all available resources to achieve new goals, develop in the chosen direction and develop the state economy through trade both within one country and on the world market.

It is necessary to mention one more concept – competitiveness – the ability of an enterprise to compete adequately with other similar firms and develop effectively in a market economy. This quality expresses the ability of an organization to change the direction of its activities depending on customer demand, anticipate possible risks and avoid them with minimal consequences for its budget. There are many factors – the field of activity, consumer demand and opportunities, mainly financial, the willingness of managers to global changes, etc.

Obviously, manufacturers are not able to see the future in order to know at what point production may come to a standstill. However, it is necessary to have a backup plan, especially typical for unstable market relations, with which you can not only avoid a production crisis, but also reach a new level of company development, deferred funds that can be used to change the course of business without drastic losses.

The state is interested in supporting private business and protecting it from potential risks, so there are various programs to identify the most vulnerable places in production planning. For example, the St. Petersburg University of Information Technologies of Mechanics and Optics has created a risk register that allows you to record and track all factors affecting innovation risks. This mechanism is used at all stages – project development, organization of supplies and purchases of raw materials and equipment, manufacture of goods, etc., contains all the basic data about risks, their changes, possible consequences, people responsible for working in different directions, as well as ways to prevent and minimize consequences.

In particular, this educational institution has developed an Information Management Decision-Making System that allows you to keep a risk register and assess its importance, conduct test activities for new employees who want to get a job at the enterprise, take into account their professional qualities and much more. As mentioned earlier, well–chosen staff is a reliable way to protect against many factors of existing risks.

Based on the conducted research, it can be noted that most innovation risks are associated with limited financial resources. In the course of activity, the costs for each stage of production formation often exceed the expected ones, new areas appear for which funds need to be allocated, prices rise due to inflation, etc. Recently, the number of companies aimed at creating and selling products has increased, but the quality of the goods produced is not always the best.

Everything is complicated by the budget of the organization – miscalculations in the purchase of goods lead to the purchase of cheap but lower–quality raw materials, lack of funds for equipment - the use of old, less efficient devices and many others. All this leads to the appearance of cheaper, but less high-quality products.

Summing up the above, I would like to remind you once again about the existing technical risks. As mentioned earlier, it is impossible to predict at what stage of the company's development losses will appear, but they can be prevented and minimized.

In this article, we discussed the most possible factors that negatively affect the development of production facilities, which can cause significant losses to the efficiency and image of the company. In addition, we have studied the nature of their occurrence, the main causes of their occurrence and ways to eliminate them.

The use of information technologies, on the one hand, makes it possible to avoid technical risks by optimizing production, improving equipment, replacing human labor, using risk registers, etc., but on the other hand, they carry new problems, the use of which does not guarantee an absolute result.

Another important factor that I would like to mention again is the search for qualified and responsible employees who are able not only to do their job competently, but also to be prepared for emergency situations. It is necessary to constantly improve the level of knowledge of the team – to conduct educational courses on working with equipment, to remind them about compliance with safety regulations at work, to send them to study courses, to apply mentoring, etc.

By observing all the above rules and hiring competent analysts who are able to constantly monitor changes in market demand, an entrepreneur will be able to protect himself and his company from many factors that negatively affect the improvement of his company, effectively develop his company and the economy of the state as a whole.

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