

# Basic Tendencies and Risks of Innovation Development

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**Abstract** — Risk is in the life of every man and in every society. Risks are manifested in various spheres of human life such as social, economic, political and financial. Moreover, risk has a significant impact on human life and health. Modern economy is characterized by total competitiveness where every company tries to achieve competitive advantages as they promote stability and dominant position in the market. It is stated that the best way to achieve this is by innovations. The number and quality of innovations can be increased if companies are to focus on studying and analyzing the processes and principles of their own development. There are many types and ways of innovation development that companies can use in their activities. Innovation is an important part for the sustainable growth of science as well as economic development. They are the key element for ensuring innovative scientific activity and stimulation of economic growth. The work presents interdisciplinary scientific research of innovations with a clear praxeological vector. This article discusses the philosophical and scientific side of innovation which is presented by concepts, types, levels, and risks, as well as the most effective scientific and practical ways to use innovations in achieving a high level of innovation of an organization while considering involved risks.

**Keywords** — *innovation, risk, innovation process, innovation, dialectics, post-nonclassical science, competitiveness*

## I. INTRODUCTION

Risk is an inherent part of human life and society. Risks are everywhere and can have a significant impact on such key aspects of human society as health, working capacity and safety of an individual and society, inviolability and integrity of person's property and financial resources, as well as the stability of political, economic, and social situation in general. Along with "personal" side of risk, contemporary science involves into risk identification economic, industrial and administrative spheres. Based on these ideas a stable risk classification by various characteristics was formed. We carried out a brief descriptive analysis of the classification.

According to contemporary science, risks can be natural, technogenic, mixed, dynamic, financial, industrial, property, commercial and social [1]. Natural risks are characterized by risks arising from natural disasters such as earthquakes, floods, hurricanes, typhoons, lightning strikes, volcanoes, etc. If to talk about man-made or technogenic risks, it can be mentioned that they are associated with economic activity of

a man and society. Mixed risks are natural events due to human activities. In other words, mixed risks are the result of technogenic risks impact on natural ones. If to draw an analogy with the practical side of scientific knowledge it is possible to say that this kind of risks, which include natural and man-made risks, generally cause damage to economic and managerial activities of an organization as being exclusively associated with business activities losses. It is the risk of physical assets losses due to damage of property or weak organization [2].

Dynamic risks represent unexpected changes in cost, market or political situation. These risks are characterized as both losses and additional profit in relation to the planned outcome. Industrial risks are adapted to the production sector and are associated with the losses due to production stopping, improper use of equipment and technology, fixed and current assets of the main economic resources [2].

Financial risks relate to the probability of cash losses, and this type of risks is presented in organization and human activities. In this regard, there are two types of financial risks: risks associated with the purchasing power of money and risks associated with the investments. Property risks reflect the possibility of property losses due to various reasons such as theft, sabotage, negligence, over-voltage of technical and technological systems, property damage. Business risks represent the risks associated with entrepreneurial activity oriented to profit maximization and arise during disposal of goods and services produced or bought by an enterprise. Social risks are directly related to life, health and working ability of employees, their personal characteristics and working conditions [1]. Summing up the results of a brief analysis of the risk classification, it is worth noting that social risks include all types of aforementioned risks as a person and social relations are presented in any process associated with risks. The human factor is an integral part of both risk formation and risk elimination.

At the moment intensive development of entrepreneurial activities triggers competition growth between companies producing similar products or providing similar services. Moreover, enterprises are under pressure from customers who expect to purchase products of the best quality, so to improve competitiveness and minimize occurrence of unexpected situations enterprises are forced to look for new ways of organizing and implementing production activities,

which consist in new product development, maintenance or improving existing ones. In other words, enterprises must be constantly innovated. What do innovations really give to an enterprise?

The paper does not cover all characteristics of innovations and related risks but presents a very good basis for proper usage of innovation as well as ways of transforming it into a competitive advantage for a company. An attempt is made to comprehend innovation through the lens of philosophy, risk identification, and assimilate innovation with different scientific fields to define innovation in terms of economy, manufacturing and other applied fields.

## II. MATERIALS AND METHODS (MODEL)

Innovation is the process of transforming a new idea or new knowledge into a new product or service [3]. Joseph Schumpeter defines innovation as the activity to increase, expand production and the emergence of new products.

According to J. Schumpeter innovation can be attributed:

- supply of a new product (s): companies develop and offer a new product that has not previously been presented in the market;
- implementation of a new method of production: introduction of new technologies and improvement of existing methods of production that contribute to improving the efficiency of resource use, increase production, reduce costs;
- opening new markets: innovations expand sales markets as well as increase the number of customers;
- search for reliable suppliers of raw materials: suppliers quite often increase the cost of raw materials and reduce their quality, all this affects the property and the price of finished products, therefore, the entrepreneur needs to find a reliable supplier of raw materials necessary for production of new products;
- creation of a new type of organization: J. Schumpeter describes this step as the emergence of a new entrepreneur on the market as a monopolist or the creation of certain conditions by which an entrepreneur can take a monopoly position in the market [4].

P. Lyonnet defines innovation on the one hand as the process by which the new idea is brought to the stage of commercial use, on the other hand, as a dynamic, technical, economic and social process involving the interaction of people from different areas of production due to different motivation [5]. Innovation is a complex process of creating a new product or service, new technological processes, new organizations (devices), as well as activities to improve them. Based on this definition, innovation is a complex concept, which has in its structure a set of elements. The ratio of the individual elements of the concept of innovation is as follows: innovation in production – development and improvement of a specific product; innovation in the service sector – the supply of new or improvement of existing services; innovation in the organization of production – the search for new ways of organizing and combining resources in the production of specific goods and services; innovation

in management – the creation of new ways of organizing business resources.

The scientific and practical significance of innovations can be interpreted in the subjective aspect. From the consumer's point of view, innovation is the best quality products and services that improve the standard of living. From business and economic perspective, innovation reflects sustained growth, development, and increased profits. For employees innovation means new, promising and high-paying jobs that require great intellectual potential. From the point of view of science as a whole, innovation represents high productivity and prosperity in the field of practical application.

In everyday life, concepts such as innovation, invention, creativity and science are often used synonymously. But scientists and managers distinguish significant differences between these terms, each of which gives a specific meaning and a unique definition. Let us consider the differentiation of these concepts and their relationship with innovation more in detail. The invention is the first release of an idea embodied in a new product or process, while innovation is the first attempt to implement this idea into practice [6]. Creativity is thinking about new products, while innovation is about creating new products. Creativity is the ability to generate new ideas and opportunities to overcome problems, while innovation is the ability to realize creative research in order to improve the quality of life of the population. Consequently, enterprises can be called successful only if they invent and create new products or improve existing ones [7].

Speaking about the risks associated with innovation, one should note the genesis of risk. At what moment can one observe risk occurrence? It would seem that the answer to this question is obvious: the risk occurs in a situation of uncertainty and instability. However, this response is not exhaustive. Risk is always there, only uncertainty and instability make it more difficult to eliminate it. In such situations it is accepted to speak not about risk occurrence or elimination, but about its prevention. In terms of science the task of potential risk preventing is particularly relevant considering that the research carried out in this region is dedicated to creating specific techniques for risk management which can be applied in practice. Risk management is a fringe area of scientific knowledge that intertwines theory and practice with the line of interdisciplinarity.

In practical terms, risk management is the systematic application of policies, procedures and management practices to a task of definition of situation, identification, analysis, evaluation, treatment, risk monitoring and information exchange related to risk ensuring losses reduction and profitability increase [7]. The methodological task of risk management is to control, prevent or reduce potential risks. The problem of risk assessment is relevant, particularly during contemporary human being transformation. Under such circumstances the problem of risk identification and analysis is difficult to formulate and required using the integrated approach [1].

The comprehensive approach is considered as methodology for risk assessment in modern science and practice. According to our research risk assessment is a set

of methods to predict possibility of unplanned force majeure event, monitor outcomes, evaluate the impact of this event and form methods of its prevention. Under risk assessment, methodology defines risk as probability of unplanned force majeure event occurrence, and the magnitude of possible damage from it.

A set of risk assessment methods forms the comprehensive methodology which is named risk analysis. There are such risk assessment methods in integrated methodology as a subjective method, analysis of costs appropriateness, expert evaluations method, analytical method of risk curve constructing, model sensitivity analysis, analogue method and others. Each of the methods is described in the scientific literature, so there is no need to focus on their deep consideration.

Back on the topic of innovation, it should be said that V. K. Fedorov and I. K. Epaneshnikova, scientists in the field of innovations, have actually studied the fundamentals of the dialectical system by G. W. F. Hegel namely the categories of quality, quantity, and measure. According to the scientists these categories are indicatively manifest themselves in innovation processes. V. K. Fedorov and I. K. Epaneshnikova argue that the transformation of quantitative changes into qualitative ones or the transition from one qualitative state to another is called an innovative leap in the innovation theory [8]. It is noteworthy that the qualitative leap acquires the status of innovative, and Hegel's dialectics reveals the essence of innovation and innovation process.

Quantitative certainty of objects and processes implies justification of their differences, peculiarities in global diversity. Quality, first of all, reflects the essential certainty of the object, due to which the object has a unique set of characteristics, properties, features, including consumer qualities that identify it. The qualitative and quantitative certainty of the object reflects the basis of the "dialectics of the innovative approach" [9].

Post-non-classical understanding of innovation involves the introduction or, rather to say borrowing statement from the Hegel's dialectics, the category of measures. As in philosophy, qualitative and quantitative certainty of an object exists in the relation, the depth of which is characterized by measure. In much of Hegel's dialectical system, the innovative approach assumes that measure is the synthesis of quantitative and qualitative determinations of an object, according to which the quantitative and qualitative sides of an object corresponding to each other.

The dialectical law of the transition of quantitative changes into qualitative in terms of innovation involves processes ensuring the transition to a new level of quality. Such development is defined as a movement from simple to complex, from primary consumer characteristics of an object to new and more advanced characteristics [10].

It is noteworthy that the process can be developed simultaneously, intermittently and continuously. A certain stage of innovative development under given conditions enables the changing (losing or acquiring) subject quality, and as a result – it will become a new one. Such transition from one qualitative state to another (as a result of increasing in measure) in terms of innovation is called an innovation leap.

According to qualitative determination, quantitative certainty (size, degree, rate, and growth) is inherent in objects. As for innovation, qualitative and quantitative determinations do not exist separately, they need to be perceived and analyzed only in aggregates. This is one of dialectics laws: the transition of quantitative changes into qualitative ones.

Thus, innovation is not just a scientific and practical field, but a full-fledged practical philosophy for the development, testing and introduction of new technologies, the basis of which is G. F. Hegel's dialectics. Russian and foreign scientists note the fact that innovation process from an idea to successful implementation is defined and reasoned by three laws of dialectics established by German classic of philosophy G. F. Hegel. Innovation is the sphere of the future with a fundamental philosophical basis. Accordingly, the research in this field should not diminish the importance of philosophical approaches and categories.

### III. RESULTS AND DISCUSSION

Considering the categorical notion of risk, one should define absolute and relative expressions of risk. In other words, there are cases when risk is absolute (in magnitude) and when it is relative. The absolute value of risk is reached in the case of tangible or monetary medium of expression. The relative value of risk is characterized by results of potential unplanned events occurrence in relation to one basis. In practice, the relative value of risk can be expressed by the following example below. Basis may be either property condition of an enterprise, or resources common costs for this particular type of business or expected income (profit), then potential unplanned events can be losses associated with profit deviation, income, and another partner revenue. While considering business risks, it is necessary to take into account business losses. Business loss is a random decrease in business income [10]. The value of this kind of losses determines the degree of risk. Therefore, in economic sciences risk assessment always involves the study of potential and actual losses.

Risk identification is one of the key elements of an effective decision-making process as the consideration of specific unplanned events consideration and comprehensive risk assessment in general [8]. The task of risk identification is closely connected with risk assessment due to the fact that the occurrence of unplanned events may be accompanied with a whole set of risks, forming a complex system of outcomes and bases of different degrees of risk. If an unplanned event or problem is not properly defined, the process of risk analysis will be in the wrong direction, resulting in new risk occurrence in correlation with unplanned events.

Risk identification involves the process of finding a source of innovation. The sources of innovation for enterprises can be employees, business partners, suppliers, consumers, competitor companies, educational institutions and other non-profit organizations engaged in scientific research.

A lot of modern scientists are convinced that it is necessary to systematize the sources of innovation. According to our research we consider that the systematization by P. De Ridder [11] is the most detailed,



succinct and informative at the same time. Let us consider it more in detail.

The market is a source of innovation. Unexpected changes in the market or in its sectoral structure can generate potential opportunities for innovation. Changes in the demographic situation, social mood, values, norms and lifestyle of a person and society can increase needs to meet which is possible only using a new innovative way.

Regular consumers are often considered as valuable sources of innovation. In order to obtain the most complete information about products, it is necessary to organize constant monitoring and analyzing products (services) consumers. Buyers or customers can act as a source of valuable information about unmet needs and can also point out innovative solutions to existing problems. In addition, difficulties (errors) in the operation of an enterprise can lead to circumstances in which only innovative goods or services can act as a solution to emerging problems.

Suppliers are also a valuable source of innovation. Suppliers are interested in working with leading companies. On the other hand, enterprises aim to developed partnerships with leading suppliers which are capable to supply raw materials required for the development of new and improvement of existing needs for production, as well as to identify the innovative potential of an enterprise.

First-hand experience can also be an important source of innovation. Unexpected successes and failures can provide new and valuable information. It makes no sense to hide and ignore failures associated with production and products or services sale, it is advisable to study problem causes and find innovative ways to solve them.

Having regard to the above, we can sum up general conclusion: sources of innovation can be entities and processes that influence on enterprise activities. The market, suppliers and consumers (both external and internal) are of the greatest importance.

Peter F. Drucker, an American scientist in the field of entrepreneurship and management, in his book "Business and innovation" [12] has given the classification of innovation activities according to the following principles: "what should be done" and "what should not be done" in the innovation process. Let us look at these principles more in detail. The first principle is "what should be done".

The first step of innovation is to analyze enterprise potential which can be observed in unplanned events, differences in work processes, requirements for production processes (needed to create a new process), unexpected changes in industry or market structure, demographic changes, changes in new knowledge perception, and skills and abilities.

The second step is shown in the following thesis: innovation is conceptual and perspective activity. The second main objective of innovation is to meet customer's expectations, meet modern trends in science and technology. In order for innovations to become efficient and effective, they should be widely available and targeted into implementation. If innovation process is a priori complex and economically loaded, and there are some difficulties in performing it, then implementation and use of innovations

become practically impossible. In this regard, the successful implementation of innovations directly correlates with their accessibility and simplicity. Accordingly, unconditional recognition of innovation by society lies in general evidence.

The third step is determined by the rule: innovation must be "small". Innovation should not be monumental; it should be about something concrete and real. In the beginning, innovation should be low-cost, focused on a small number of people and a limited market.

Finally, successful innovation should aim to leadership. If innovation at the very beginning of its life cycle is not focused on leadership, it is likely not to become an "innovatively" sufficient one.

These are the basic rules that should be taken into account while developing and implementing innovations. In any case, companies engaged in innovation activities tend to comply with these rules. However, there are a number of postulates that needed to be considered and understood when designing and implementing innovations. In other words, it is "what should not be done" in the innovation process.

Innovation should not be too "smart". Everything that is done in a very smart way, either in the design or in the final stage, is likely to fail. Therefore, innovations should be tested at the household level.

Innovation is not created in an instant. High-quality innovations arise only when all eyes have been on them and only with the maximum effort given by developers at all stages with rather valuable time.

Innovation is not for the future; it is for the present. Some innovations are aimed at long-term development prospects in the future and will need time to achieve a kind of "maturity". Therefore, in order to ensure that innovations benefit now, they are to be used to solve today's problems.

From the above-presented postulates, we can say that innovation process is very costly one as it requires using a variety of resources, needed for innovation implementation, such as labor, financial, tangible, intangible, and time resources. In this regard, the implementation of the aforementioned rules of innovation will allow allocating all costs more efficiently and, if it is possible, minimizing them. However, the practice rules stipulated by principles of the innovation classification are not enough for a full-fledged study. Let us consider basic principles needed for occurrence and development of the innovation process.

1. Innovations are generated by transforming existing problems into a particular idea or concept. New ideas are created when there are problems, risks or inconsistencies that surround a person, an enterprise, and society and have not still been solved by known methods. In this regard, innovation development demands such conditions that are required for solutions of current problem situations and stimulate the occurrence of new needs at the same time.

2. Innovation requires using a systematic approach. All businesses are characterized by the presence of an innovation system. Some of the systems are formally developed to tend to the leadership, and some are informal and take place outside official channels. Informal channels

are unorganized and inefficient, but innovation is always associated with them.

3. Professional enthusiasm is a special kind of “fuel”, but risk is a “hidden ingredient”. Ideas are not implemented on their own, professional enthusiasm makes them move. Professional enthusiasm, in addition to talent and skill, is valuable asset of a company. Professional enthusiasm is the force that turns other resources into profits, but it is never disclosed in the balance sheet.

4. Joint consideration of ideas leads to effective exchange of professional and scientific information. This is the key to build trusting working relationship and creating a favorable microclimate in a working group which is important for the innovation process. Thus, there is an increased opportunity for greater information exchange, mutual ideas enrichment and stimulation of creative thinking to one another, and ideas criticism at the stage of their formation.

5. Differences in opinion should be used for innovation benefit. Such differences as language, culture, race, gender, mindset, and problem-solving style have resided in society and an individual. At the same time, they can be considered a boon to innovation. When differences are used constructively and society becomes free from fear, suspicion, distrust and prejudice, then differences can be used to sustain and improve the innovation process.

#### IV. CONCLUSION

The growing role of innovation in scientific, economic, technological and social development can help societies confront the global challenges of the twenty-first century. Many of the standards governing innovation are European and international, so a lot of efforts are being made to adapt to this legislation in all areas. The professional and scientific community has recognized this reality and has called for various actions to stimulate innovation. Several basic conditions allow innovation to stimulate economic growth: clear standards and effective enforcement of intellectual property protection; strong competition and competitive markets; strong and sustainable basic research and infrastructure development; promotion of information and communication technology developments; emphasis on education at all levels and so on.

In this regard, systematic assessment of risks will ensure: a more realistic planning; timely and effective response; confidence in achieving goals and objectives; understanding and using of all favorable opportunities; effective management of possible inconsistencies and losses; the effective management of project and economic costs; flexibility in the result of understanding all options and associated risks; effective management of development of the innovative management approaches; reduce the impact of unexpected and adverse situations as a result of effective planning.

The methodology of risk assessment takes into account risks that affect key scheduled events and contribute to secondary risk development. In general, the methodology of risk assessment in modern science and practice is highly dynamic. The effectiveness of its implementation and adaptation in specific circumstances depends on many

factors such as innovation in science and technology, modernization of existing techniques within risk analysis, transdisciplinary nature of new developments, techniques, technologies, speed and nature of changes in the external and internal market, economic situation, and financial state. Based on the above, the methodology of risk assessment in modern science and practice should be based on knowledge, skills and abilities which apply a common set of methods within the scope of risk analysis and the ability to assess specific non-standard unplanned situations quickly and adequately, and the ability to prompt optimal adequate decision-making process.

In today’s economy, innovation is a key driver of job creation, product value, and economic growth. Innovation processes in organizations occur at the regional and national levels. Innovations lead to the formation of new organizations, as well as to increase the competitiveness of existing ones. Post-non-classical science defines innovation as one of the key positions in the development of all spheres of human life and society. Innovation now is not only an applied field of economic and technological reality but also an important scientific field with powerful potential. In many respects, this explains the introduction of innovations in the scientific, philosophical and applied research context in the shortest possible time. The innovation philosophy, the assimilation of innovation in different scientific fields, innovation in the economy, manufacturing and other application areas are a graphic illustration of interdisciplinary and transdisciplinary nature of innovation in post-non-classical science in general.

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