EXCELLENCIA
INTERNATIONAL MULTI-DISCIPLINARY JOURNAL OF EDUCATION
Volume 02, Issue 05, 2024 ISSN (E): 2994-9521

Classification and Types of Innovations in the Context of Digital Transformation

Mamatova Nodira Mirzavaliyevna [1]

Abstract:

The article examines the conditions in which companies will have to carry out innovative activities during the period of digital transformation and the emergence of Industry 4.0. The article presents a matrix of the relationship between types of managers and companies by readiness for innovation and types of innovation by their novelty. The work analyzes the features of the activities of companies that are aimed at leadership in the innovation sphere in the conditions of "Industry 4.0" in comparison with the previous stage of scientific and technological development ("Industry 3.0").

Keywords: innovation activity, digital economy, technological innovations, marketing innovations, digital products.

Adapting companies to the new conditions of digital transformation, or Industry 4.0, is a key challenge facing not only industry leaders, but also all economic entities that want to develop sustainably in the present and future. If Industry 3.0 involves selective automation of individual stages of production and management processes, then Industry 4.0 requires "end-to-end digitalization and integration of value chain data: offering digital products and services, operation of related physical and virtual assets, transformation and integration of all processes and operational activities, partnerships, as well as optimizing customer service." Company management needs to understand the depth and complexity of technological, organizational, operational, personnel, and marketing transformations that need to be implemented. The new things that companies must face are innovations for them. Their success will depend on the degree of openness and readiness of management and companies for these transformations.

The term "innovation" first began to be used in a social context in France in the 13th century, and later, in the 16th century, in English. Then this term described something new in language and law. In the 19th century, the term "innovation" began to mean something borrowed by one culture from

another, and only in the 20th century, as many researchers believe, the term received a scientific explanation thanks to the Austrian economist J.A. Schumpeter.

An important tool for studying innovations is their classification, which helps to better determine the type of innovations used in order to assess their impact, significance and consequences of implementation in the activities of the enterprise.

Of undoubted interest is the classification of innovations given in the so-called "Oslo Manual".

According to this document, there are four types of innovation:

- ✓ technological innovations (product and process);
- ✓ organizational and managerial innovations;
- ✓ marketing innovations.

Technological innovation is the final result of innovation activity, embodied in the form of a new or improved product (Table 1) or service introduced on the market, or an improved process or method of production (transfer) of services used in practical activities. An innovation can only be implemented when it enters the market or becomes involved in production.

Table 1. Types of Product Innovations

Types of Product Innovations	The essence of innovation
Technologically new product (work, service)	A product that is significantly superior to other similar products in its properties, functions, materials and components used
Technologically improved product (work, service)	A product that has been modified, improved from a technological point of view through better materials, components or an improved manufacturing process

Product innovation covers technologically new ideas or improved products. A technologically new product is a product whose functional characteristics, properties, construction or materials used and components of which fundamentally distinguish it from products previously presented on the market. Such innovations may rely on entirely new technologies or a combination of technologies in new applications. Technological improvement of a product concerns an already produced product, the qualitative or quantitative characteristics of which have been significantly improved through the use of new components, raw materials, etc.

Process innovation (Table 2) is the development and implementation of technologically new or significantly improved production methods.

Table 2. Process Innovation

Sphere of Manifestation	Change Objects
New or significantly improved methods of producing goods and services	Changes in the production process Use of new equipment or software products Introduction of new production technologies

New or significantly improved methods of procurement, logistics	Improved methods for organizing logistics workIntroduction of new equipment for the distribution of resources and finished products within production Changes in approaches to organizing processes for promoting and selling products
New or significantly improved system maintenance methods (maintenance and repair)	Use of new or qualitatively improved technologies, production equipment or software in the service system

Such innovations may involve changes in the production process, the use of new production technologies and new, previously unused equipment. They can be used both for the company's existing products and for new ones, the introduction of which is impossible based on conventional production methods.

Product innovation covers both the development and introduction of technologically new and significantly improved goods, works or services.

Organizational or organizational-managerial innovations are special and different from product and process types of innovation. Organizational innovations include 3 main areas: innovations related to ways of doing business, innovations in the organization of workplaces and innovations in external relations.

Marketing innovations are innovations that are aimed, on the one hand, at qualitatively improving the characteristics of packaging, appearance, and product design, and on the other, at developing new sales markets, meeting new needs (including newly created) and (or) consumer groups , mastering new methods and promotion channels. The main distinguishing feature of marketing innovations from technological innovations is that the functional and user characteristics of a product or service remain unchanged.

Innovations are not necessarily completely new ideas. Depending on for which economic entities the change is new, i.e. is an innovation, the following levels of novelty are distinguished:

- ✓ global novelty,
- ✓ novelty on the national market,
- ✓ industry novelty,
- ✓ market novelty,
- ✓ novelty at the enterprise level.

We believe it is possible to assess the results of innovation activities and the level of impact of technological innovations on the competitiveness of an organization by determining the dynamics of sales due to the implementation of innovations, for which the indicator of innovative products is used.

The purpose of the study is to study the features of innovation in the context of the transition to a digital economy. The authors hypothesized that there is a relationship between the type of manager and company in terms of readiness for innovation and types of innovation in terms of their novelty.

The scientific novelty of the study lies in conducting a comparative analysis of innovating companies of Industry 3.0 and digital champions of Industry 4.0 according to the author's criteria, developing a matrix of relationships between types of managers and companies by readiness for innovation and types of innovation by their novelty.

Innovative products are technologically new or improved goods, services, works that have undergone various kinds of technological changes over the past 3 years. Innovative products include:

- newly introduced (received noticeable technological changes) products based on new (including completely new) technologies or their combination with existing ones. For this product, the scope of application (use), operational characteristics, features, design, as well as the composition of the materials and components used must be new or significantly different from previously manufactured products;
- products that have undergone improvements - based on the introduction of new or significantly improved production methods, involving the use of new production equipment, new methods of organizing production, or a combination of both.

A multidisciplinary approach to the study of innovation is actively spreading among researchers. Innovation activity is presented as an open process that goes beyond the organization and is initiated, among other things, by consumers. The type of innovation that is created by users to improve the characteristics of a product, its design, and methods of use is called user innovation. Users generate innovative solutions when the market potential has not yet been explored and formed, when there are no expectations for a return on investment.

The next task is to reveal the content of the concept of "innovation activity" and establish relationships with the concept of innovation activity discussed above.

The innovative activity of an enterprise is one of the main factors of its competitiveness. A number of scientists consider innovation activity as a complex characteristic of innovation activity, others consider it as the intensity of innovation activity.

The innovative activity of an organization, according to Shchekoturova S.D., is scientific, technological, organizational, financial activities, including the commercialization process, implemented in the presence of the appropriate potential of the enterprise, capabilities, abilities and its readiness, which reflect the timeliness and intensity of the implemented activities for the development and implementation of innovations.

Trifilova A.A. By innovation activity we mean the intensity of activities carried out by economic entities to develop and involve new technologies or improving products into economic circulation.

According to Fatkhutdinov A.A., innovative activity is a comprehensive characteristic of its innovative activity, including the degree of intensity of the actions taken and their timeliness, the ability to mobilize the necessary potential, including its hidden sides, the validity and progressiveness of the methods used, the rationality of the technology of the innovation process in composition and sequence of operations.

As for the types of innovative activity of a company, it may consist of the following components:

- ✓ Research and development;
- ✓ acquisition of machinery and equipment;
- ✓ acquisition of new technologies;
- ✓ acquisition of rights to patents and patent licenses;
- ✓ acquisition of software;
- ✓ education and training of personnel;
- ✓ marketing research.

It is important to understand innovation activity and develop measures to increase it is to identify the various groups of company employees involved in innovation processes. These may include the following groups:

- developers, authors of innovations are people who evaluate a new idea, its possibility of practical application, they determine the basis and content of the innovation, and then protect the rights to the new idea that has appeared;
- production workers are a group of people who are directly involved in the practical implementation of innovation;
- investors – participants in the innovation process, whose goal is either to find the funds necessary to implement an innovation, or to independently invest in an innovation project;
- innovators are the connecting links between all participants involved in innovation. These include technology brokers, entrepreneurs, innovative entrepreneurs;
- facilitators are all those institutions and institutions that constitute a favorable infrastructure for the implementation of innovations and create an innovation ecosystem. The innovation ecosystem represents a system of interactions between business, science and government in the creation, transfer and implementation of research developments. They do not directly participate in the process of innovation, but create the conditions necessary for its successful implementation. These may include government agencies, development institutions, educational institutions, consulting companies, etc.

Developers create ideas, production workers implement them at their enterprises and production facilities, investors provide them with the necessary resources. However, the innovative entrepreneur plays a key role in innovation. It is he who unites all other participants, initiates the start of activity and supports it at all stages of the process. Facilitators create the conditions for activity. All these groups of people are involved in the process of innovation of the company; they strive to increase the competitiveness of the company, which, in turn, consists of different areas of activity.

Sources:

1. Artamonova M.V. Managerial work and the role of managers in the digital economy in Russia // Scientific research of the Faculty of Economics. Electronic journal. 2019. Volume 11. Issue 1. - pp. 49-61
2. Bogdanova, E.L. Innovations and factors as sources of growth in the efficiency of industrial production [Text] / E.L. Bogdanova, O.I. Golovko, Yu.V. Sharikova, A.V. Varyushin // Economics and entrepreneurship. – 2016. – No. 4-2 (69-2). – P. 86-903. 2018 Global Digital Operations Study “Digital Champions.” P.W.C.
3. Zaitseva A.S., Shuvalova O.R. New accents in the development of innovation activity: user-initiated innovations // Foresight. – 2011. - vol. 5 No. 2 – P. 16-326. Katerin S.P. Accounting and analytical system for managing the innovative activities of an organization. Dissertation for the degree of Ph.D. n. Rostov-on-Don. 20167. Petrenko E.S., Denisov I.V., Koshebaeva G.K., Koroleva A.A. Prospects for business models: “blue oceans”, business management, innovation on the demand side and sustainable development // Creative Economy. – 2019. – Volume 13. – No. 12. – P. 2327-2336.