Increase of Efficiency of Industrial Enterprises Activity on the Basis of Innovations of Various Types

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Abstract

We have analyzed influence of various innovations on economic activity efficiency. Innovations are subdivided into two types according to criteria: "novelty application field"; "degree of innovation novelty". The first class includes technological, technical, economic, organizational, and management innovations, influence of which on the efficiency is performed directly through applied technologies and organizational and management structures. We have also distinguished a subclass of innovations of the said criterion influencing indirectly on the efficiency. Seminal, basic, improving, pseudo- and micro-innovations influence of which on enterprise activity happens indirect through intermediate institutions and mechanisms are ranges in the second class. Thus, increase of efficiency of an enterprise activity presupposes analysis of various innovation influence on manufacturing process characteristics and selecting of the most suitable ones.

Keywords: innovation; typology; efficiency; influence mechanisms.

1. Introduction

Application of innovations in an industrial enterprise is always oriented to increase of efficiency of its industrial activity and forms corresponding reserves for increase. But multifacetedness of innovations, directly determining the nature and a concrete sphere for their application, externalizes itself in the business practice in terms of various types of innovations which differently influence on economic efficiency. In other words, innovations of various types determine various ways of increase (reserves) of efficiency of shaping innovation and technological potential of the enterprise which correspond to these exact innovations. In some cases innovations provide increase of

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industrial efficiency, for instance, by increase in demand for output product through improvement of its quality, or by enlargement of production of goods with new properties, in other cases - by cost reduction, for example, due to reduction of the enterprise production cost via application of new superior and more cost efficient technologies of cutting, processing, etc.

Today we know and apply rather numerous types of such innovations in industrial enterprises activity, and one or another classification features, the most important of which is an innovation application field, are taken as a basis of their typologies. According to this criterion it will be reasonable primarily to distinguish and analyze those innovations which have direct influence on industrial enterprise efficiency via technologies, methods and means applied in the industry, as well as via organizational and management structures. They are technological, technical, economic, organizational, and management innovations.

So far technological innovations are the best-investigated, and in a loose sense they mean utilization of superior methods of transformation of resources into the final product. They are initial and more significant ones which serve as the basis for many other innovations, straddle all levels of industrial production, and influence on formation of the main growth and development trends of enterprises. Resources of efficiency increase of scientific and technical potential application defined by them are connected with application of new or improved, more efficacious and economic methods of production oriented to improvement of outputs quality, product expansion, and marketing development.

Technical innovations are immediately adjacent to technological ones, and their influence on industrial production efficiency is performed mainly via manufacture of products with new improved properties.

Another sphere of economic innovations, which are considerably developing on the basis of technological ones, is an application of superior and more efficient forms of manufacturing process management, such as specialization, cooperation, diversification, as well as new and improved methods of labour management, involvement of new finance and credit instruments, types of securities, etc. (Khalabuda Y.E., Nikolaev M.V., 2013).

Organizational and management novelties, which are often affiliated by the term "organizational and management innovation", influence on industrial enterprise efficiency via industrial structure enhancement, management of particular economic processes, via forecasting of their development dynamics and changes of the climate in the competitive environment. They considerably intersect economic innovations jointly forming significant reserves for industrial growth, which, however, frequently are underutilized.

The stated typology can be amplified by provisions of the well-known Oslo Manual in various publication of which findings of investigations concerning categories and types of innovations conducted within 1980s - 1990s were summarized (Oslo Manual, 1992, Oslo Manual, 1997), and later on, in 2000s, their structure was itemized and expanded by non-technological novelties as understanding of nature and content of innovations had been deepened.

And if the most of the focus of the first and the second publications of the Manual of 1992 and 1997 was on technological product and technological process innovations respectively, then the third publication of 2005 (Oslo Manual, 2005) suggests product (the analogue of the mentioned technological product innovations), process (the analogue of the mentioned technological process innovations), marketing, and organizational innovations. At that it has been noted that "concepts of product and process innovations are close to previous concepts of technological product and technological process innovations. And introduction of marketing and organizational innovations extended the range of types of innovations considered in the Manual" (Oslo Manual, 2005, p. 32).

According to this publication content of product innovations includes introduction of a product or a service which are new or which properties or application methods are significantly improved. It also involves significant improvements of technical characteristics, components and materials, embedded software, operability or other functional characteristics (Oslo Manual, 2005, p. 32) which provides influence of product innovations on efficiency of the enterprise activity. It follows from this definition that these innovations can be based not only on new knowledge and technologies but also on new methods of application or new combinations of already existing ones.

The Oslo Manual published in 2005 defines process innovations as "adoption of technologically new or significantly improved production methods, including methods of product delivery. These methods may involve changes in technology, production equipment, and/or software" (Oslo Manual, 2005, p. 33).

At that, the production method shall be understood to mean technological procedures, equipment, and software applied in production of commodities or services. Method of delivery is intercrossing with logistics system, involves equipment, software and technologies applied both for feed stock supply and end product delivery, for example,
implementation of goods transfer recording by a bar-code or dynamic radio-frequency vehicles monitoring system. But as to the abovementioned changes, their ultimate purpose is the reduction of production costs and improvement of quality of the enterprise products or reduction of expenses for their delivery.

Thus, we can see that methods and mechanisms of influence of product and process innovations on increase of efficiency of industrial enterprises are similar to methods and mechanisms of previously characterized technological, technical, and partially economic, and management innovations.

Marketing innovations mentioned in the Oslo Manual, 2005 are described as implementation of a new method of marketing involving significant changes of design or package of the product, its offering, market promotion, or price fixing. ... They are focused on better customer need satisfaction, opening of new channels or achievement of new market powers for products of the enterprise with a view to increase in sales (Oslo Manual, 2005, p. 34). Here significant changes shall be understood to mean such changes which were previously applied by this enterprise and shall be a part of such new approach or strategy of marketing which significantly differs from marketing methods applied in the enterprise earlier.

At that, this new method can be developed independently by the enterprise performing innovation, or adopted from other enterprises or organizations. New marketing methods can be implemented both for new and already existing products (Oslo Manual, 2005, p. 34).

It is obvious that significant, but yet slightly involve into production, the reserve for increase of activity efficiency of Russian industrial enterprises and application of their innovation and technology potential is connected with marketing innovations.

Organizational innovations mentioned in the Oslo Manual mean implementation of new organizational method in business practice of the enterprise, arrangement of work sites, or external relations (Oslo Manual, 2005, p. 35). As it appears from the description, their distinctive feature lies in implementation in business practice, arrangement of work sites, or external relations of any new organizational methods which are the result of actualization of strategic decisions of the enterprise's management team.

According to the abovesaid we can understand that content of organizational innovations (per the Oslo Manual classification), although do not fully coincide with corresponding contents of previously analyzed organizational and management novelties, but considerably intercross with them, and forms of their implementation are similar. Thus, it is fair to say that unification of both considered approaches to innovation typology within the frame of practically the same criterion increases opportunities of analysis and perception of the matter and forms of innovation display and influence of innovations on efficiency of industrial enterprises activity.

Researchers often put forward another types per the criterion of the novelty application field. For instance, Y.V. Yakovets also distinguishes political-social and political-legal innovations, innovations in spiritual sphere, military innovations and innovations in the area of law and order (Yakovets Y.V., 2004, p. 13 - 14). As well as the other innovations analyzed above, they influence on efficiency of industrial enterprises activity, but as distinct from all of them, this influence is not direct (immediate) but implicit, it happens via different public institutions: legislation, law, public administration, distributive and redistributive processes.

The second quite often applied classification criterion is the degree of innovation novelty. In accordance with this criterion seminal, basic, improving, pseudo- and micro-innovations are distinguished. These innovations also have irregular influence on formation of reserves for industrial growth: seminal and basic innovations influence on industrial enterprises activity indirectly through intermediate institutions and mechanisms, and on carried out national research and development and industrial policy, forming long-term sources and trends for economic growth, while improving, pseudo- and micro-innovations have short-term direct influence.

According to S. Kusnets, "fundamental outbreaks in human knowledge development, those which appeared as the main source of the long-term growth and the wide spread occurrence in the world, can be called seminal innovations. Changeable economic history can be divided in economic epochs each of which is determined by a seminal novelty with its natural growth characteristics" (Nobel Prize Winners in Economics: outlook from Russia, 2003, p 105). These innovations happen once in several centuries symbolizing a passage to a new technological or economic production method as, for instance, industrial and scientific and technical revolutions.

Basic innovations the concept of which has been suggested by G. Mensh (Mensh G., 1979) influence on efficiency of industrial activity through changes in technological basis of the society, for example, due to passage to
a new technological pattern, establishments of new industrial fields and new markets, new forms of organization and management.

As distinct from seminal and basic ones, improving innovations, as mentioned previously, are long-term and oriented to advancement of new-generation machines (technologies). They appear for the main and most numerous mass novelties in production and management which are the most commonly occurring ones in practical economic activity of industrial enterprises.

As compared to improving innovations, the smaller role in formation of reserves for industrial growth accrues to micro- and pseudo-innovations. First of them are directed only to improvement of some particular elements or properties of products or processes and have comparatively inconsiderable efficiency potential. Second of them presuppose either partial improvement or renewal of all outdated elements of enterprise manufacturing systems which have already depleted their efficiency potential.

Thus, we can see that increase of efficiency of industrial enterprises economic activity on the basis of innovations and formation of corresponding reserves for industrial growth presuppose typology of novelties, obligative careful analysis of paths of their influence on characteristics of the said activity and commitment to those types of them which are able to provide the best desired result.

References