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Innovations' latency sources

Fuentes de latencia de innovaciones

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Contents

ABSTRACT:

The article studies and systemises the sources of innovations' latency which, being the reflection of the uncertainty of the innovation process, can at the same time become a source of additional or future competitiveness of innovations as such as well as enterprises conducting innovation activities. Success and competitiveness of an enterprise mostly depend on the implementation of the innovation process and possibility of fulfilling innovation potential hidden within innovations. The main goal of the work is to identify the sources of innovations' latency for their further practical use in the innovation process at industrial enterprises. As a result of the conducted research, the following conclusions have been made: • latency of innovations is a key factor of the whole innovation process; • latency of innovations is a source of new ideas, which considerably improve the life cycle and competitiveness of the innovation itself as well as the enterprise; • search and implementation of latent qualities and possibilities of innovations have multiplicative effect since the more latent qualities and possibilities of innovation are implemented, the more opportunities for new ideas there are.

Key words: latency of innovations, sources of innovations' latency, innovation process, needs, competitiveness, industrial enterprises.

RESUMEN:

1342/5000 El artículo estudia y sistematiza las fuentes de latencia de las innovaciones que, al ser el reflejo de la incertidumbre del proceso de innovación, pueden convertirse al mismo tiempo en una fuente de competitividad adicional o futura de las innovaciones y de las empresas que realizan actividades de innovación. El éxito y la competitividad de una empresa dependen principalmente de la implementación del proceso de innovación y la posibilidad de cumplir el potencial de innovación oculto dentro de las innovaciones. El objetivo principal del trabajo es identificar las fuentes de latencia de las innovaciones para su posterior uso práctico en el proceso de innovación en las empresas industriales. Como resultado de la investigación realizada, se han llegado a las siguientes conclusiones: • la latencia de las innovaciones es un factor clave de todo el proceso de innovación; • la latencia de las innovaciones es una fuente de nuevas ideas, que mejoran considerablemente el ciclo de vida y la competitividad de la innovación misma, así como de la empresa; • la búsqueda y la implementación de cualidades latentes y las posibilidades de las innovaciones tienen un efecto multiplicador ya que cuanto más latentes sean las cualidades y las posibilidades de innovación implementadas, más oportunidades habrá de nuevas ideas. Palabras clave: latencia de las innovaciones, fuentes de latencia de las innovaciones, proceso de innovación, necesidades,

competitividad, empresas industriales.

1. Introduction

In the modern context, efficiency and competitiveness of any industrial enterprise largely depends on the possibilities of creating and implementing innovations and innovation potential. Innovations are the key stimulus for civilised development at this stage of the World-System's evolution (Freeman 2005). Due to innovations, industrial enterprises ensure their market competitiveness by reducing expenses and improving working efficiency (Sekerin, Burlakov, Dzyurdzya and Gorohova 2015). Implementation of innovations allows the enterprises to get considerably competitive advantages while lack of innovation activity results in gradual loss of competitiveness of the enterprise and its further exit from the market. The innovation factor is considered to be a dominant factor of the stable development taking into account the restrictions in inner and outer environment of business and corporate entities (Dudin, Lyasnikov, Veselovsky, Sekerin, and Aleksakhina, 2014). Innovation activity of the enterprise determines the overcoming of the crisis and effective and competitive development (Schumpeter 1996). Only this approach can ensure the competitiveness of industrial enterprises and their transition from imitating, or, in other words, poorly performing enterprises, to the ones which implement their ideas independently and are followed and imitated by other producers (Maricheva 2013).

One of the factors which can ensure mid-term and long-term competitiveness of the enterprise is latency of innovations or, in other words, latent innovation potential containing the possibility of creating and implementing new innovations. Latent innovation potential is a set of technical, technological, economic, social, and other components, which can condition the formation and implementation of new innovations (Drucker 2007). Implementation of innovations' latency is a key factor of strategic competitiveness of the enterprise.

Despite the fact that the term "innovation potential" has been thoroughly studied in the works (Mitiakova 2009; Korobeinikov, Trifilova and Korshunov 2000; Bukharova 2013), it still presents a certain scientific interest for further research of this notion and especially its sources. The search and study of the sources of innovations' latency condition the possibility of implementation of innovation potential and in its turn the improvement of market competitiveness of the industrial enterprise. The search and implementation of latency of innovations is a rather complex mechanism, and the more complex it is, the more it depends on the interconnection between its components.

Nowadays industrial enterprises face a rather complicated task of searching for and implementing the latency of innovations. In this case, the search and implementation of the latency of innovations is crucial aspect for different areas of the enterprise's activity. Like any advanced organism, the search and implementation of the latency of innovations should become a need and a system. This task can mostly be solved with the knowledge of the sources of the latency of innovations, their ability to be formed and implemented. When implementing the innovation potential, the industrial enterprise becomes more promising and adapted to constantly changing market conditions.

2. Methodology

Working on this article, the authors took into account the materials of online resources as well as the results and conclusions made in the numerous works of leading Russian and foreign specialists in the field of innovation management and entrepreneurship. Author's opinions and propositions regarding further development of the notion of innovations' latency were recounted on the basis of the existing works.

3. Discussion and results

Latency of innovations is characterised by high uncertainty of the final result from scientific-technical and economic point of view as well as by uncertain time lag during which latent qualities and possibilities of innovation may show up (Lapin 1981). Innovations' latency is of unintended nature and is not always comprehended and sometimes remains unperceived until the end.

Latency of innovation may be one of the key factors of the future success of innovation. Latent innovation potential can to a large extent define future competitiveness of innovation during the whole life cycle. There is not only a possibility of additional future profit in the latency of innovations, but also a possibility of formation and implementation of "revolutionary ideas" which may totally change the established traditions.

At the same time, the search and implementation of innovations' latency is not a process which can be easily formalised and mass-produced. The search for latency of innovations is a process of looking for a new idea, and it requires the ability to improvise, free your mind from stereotypes, learn something new, get information from different and unconnected areas and sources, link the acquired knowledge and use it in practice. As soon as the latency of innovations is found, the idea is to be implemented. Search and implementation of innovations' latency can result in valuable ideas which can be used by the enterprise in order to improve its innovation product, to sell it to other companies or to improve their own organisation.

Within the present conditions, search and implementation of innovations' latency is satisfaction of required needs which should become an integral part of the whole innovation process. In general, need is "a certain necessity of a subject in a set of external conditions of its existence, claim on external circumstances resulting from its essential qualities and nature. In this case the need acts as the cause of activity" (Rukavishnikov 2008). According to N.Z. Chavchavadze: "They say that people's activities are motivated by their needs: without needs a man would not act at all" (Rukavishnikov 2008).

The needs for search and implementation of innovations' latency should be divided into internal and external. That said, among the internal needs are:

further scientific cognition;

improvement of competitiveness of innovation and, correspondingly, competitiveness of the enterprise itself.

The external needs for search and implementation of innovations' latency are:

- consumers and the necessity to satisfy their needs;

- innovation activity of competitors (Innovation as a factor of competitiveness, 2009).

As for the need for further scientific cognition as a source of innovation latency, this is an aspiration for further study of phenomena, qualities, characteristics of innovations not so much for the sake of future profit as for cognition itself from the scientific point of view. The search for new idea or concept of heuristic value is always important for an innovator. During further search and study of something latent, unperceived by the innovator, new hypotheses and ideas are put forward, experiments are conducted, intra-scientific evaluations are presented. That said, existing real qualities and characteristics of innovation are valuable as practical materials for further study and creation of something new, previously unknown, since we can evaluate only practical results of scientific inquiry, which are materially displayed and can ensure the competitiveness of innovation.

Scientific cognition is aimed at further study of qualities and characteristics of innovations in order to develop new possibilities, explain them, generalise, predict, and use in the future (Spiritual needs, n. d.). The search for latent scientific and technical qualities and characteristics is of great interest from the point of view of further study of innovation potential. Further scientific cognition of innovation can result in discovering new hypothesis, finding a new empiric law, stating a problem of further development, considering a new theory.

The methods that can be used for scientific cognition (study) are observation, experiment, measurement, classification, systematisation, description, and comparison. Today such method as numerical simulation is of great importance as experiments become more complex and expensive.

The development of electronic computer can be an example of the satisfaction of a cognition need. Main principles of PC operation were presented in March 1945 under the authority of Ballistic laboratory (Armed Forces of the United States). A group of physicists headed by a famous mathematician John von Neumann, who was the main analyst, did the research. Modeling method was used as the main research tool. At first, all devices of the future PC such as, for instance, memory, control units, input-output devices existed only in the form of the scientist's assumptions. Neumann made mathematical model on the basis of empirical data acquired during the physical research and later studied the model itself instead of its prototype. The scientist translated the obtained result into the language of physics. The result of such collaboration was fundamental description of computer's equipment and functioning, which was called computer architecture (Theoretical methods of cognition: examples, characteristics, n. d.). Further scientific cognition (study) ensured significant changes in computer architecture, wider range of tasks solved by the computer; the method of computer-user interaction also changed. Scientific cognition secured the development of computer generations, from a multipurpose machine with electronic tubes to a personal computer with a microprocessor which gave us the term "information technologies" without which we cannot do in most fields of human activity today. And they still continue developing – a lot has been done for the next generation of computers with artificial intelligence. And it all started from punch-card machines invented by Herman Hollerith in America in the end of the 19th century and used for storing numerical information. This is a striking example of latent potential of innovation in a punch-card machine which was detected, implemented, and continues to be developed in another manner and matter (History of computer creation, n. d.)

Detection and implementation of latent possibilities and characteristics of innovation can contribute to innovation competitiveness as well as to the competitiveness of the enterprise. Innovation competitiveness will condition the profit improvement and further scientific development of the enterprise. Innovation is effective and valuable for an enterprise, industry, state only if it is competitive by itself, that is why one of the sources of search and implementation of innovations' latency is ensuring the competitiveness of innovation during the whole its life-cycle or even longer. Competitiveness of innovation is an ability to satisfy the competitive needs as completely as possible compared to other similar innovations or traditional goods during a certain period long enough to achieve cost effectiveness, taking into account the area, scientific and technical development, consumers, etc. Innovation competitiveness is also an ability of profitable economic realisation in a set period of time. For instance, AUDI, being a trendsetter in car safety systems, willingly sells the rights for the designed safety systems to other car manufacturers. Mercedes-Benz provides its innovation designs in the field of safety systems to other carmakers for free, thus showing they care about consumers. At the same time, it should be noted that innovation competitiveness is necessary but not sufficient condition to provide complete competitiveness of the company.

Apart from competitiveness of innovations, internal environment of an organisation is also highly important for further successful operation on the market. Search and implementation of innovations' latency may cause changes in the internal environment of an enterprise and thus solve the problems and eliminate the company's disadvantages.

We understand the changes in the internal environment of an enterprise related to innovations' latency as long-term stimulation of the innovation process at an enterprise, which would ensure long-term market competitiveness, rather than further implementation of an innovation idea.

Let us note that changes in the internal environment of an enterprise may be evolutional and situational, but in any case, they should be aimed at the improvement of the company's competitiveness. For instance, technological and physical obsolescence of the equipment leads

to the introduction of new equipment and new technologies, thus contributing to the implementation of previously latent opportunities. There is also another example. High skills of enterprise employees result in implementation of independent designs of new innovation ideas, products, technologies directly related to the company's activities, which in its turn leads to rejection of the designs, technologies, and products of third parties.

As for situational changes typical for any enterprise, they are new and sometimes unexpected situations which may and need to be foreseen to provide preparedness to them. One should always be ready for unexpected situations and perceive them as previously latent opportunities hidden in innovations' latency and innovation activity of the enterprise.

The enterprises, which will not engage in further search and implementation of innovations' latency, risk missing new discoveries, inventions, opportunities and thus weakening their competitive positions in the future. For instance, in 1970s large American companies producing computers did not see the advantages of silicon-base microcircuits, while two Americans invested $1300 and assembled the very first personal computer. As a result, 4 years later they got the profit of $200 mln, and today Apple is one of the leading companies with annual sales of over $200 bln. During further study of innovation potential one should pay attention to the results obtained in related and even remote fields, since the results obtained in such fields may later spread to other production and nonproduction areas, including the one the enterprise is dealing with. For example, microelectronics, a subdivision of electronics for creation of microminiature integral electronic devices, is now used almost in all fields of human activity – in education, medicine, mechanical engineering, etc. Innovations of the enterprise's partners can be a source of innovation latency, for example, suppliers of raw materials or equipment whose innovations may accelerate further search of latent opportunities of the enterprise's innovations.

Another important source for search and further implementation of latent innovation is innovation activity of competitors. Bench-marketing or, in other words, study of the experience, solutions, products of competitors in order to use this knowledge to search and implement latent opportunities of innovation, can be a serious source of innovations' latency. Lack of attention to innovations of competitors and their experience can get the enterprise into the list of imitators falling behind, or you will no longer be their competitor at all. An example of such inattention to innovative designs of competitors is NOKIA, which once was a trendsetter on the market of mobile phones. Being inattentive to the actions of competitors and sure about their established position, the company not only lost its competitive advantages but had to withdraw from the market and was eventually purchased by MICROSOFT, which is always aimed at innovations and latent opportunities of implemented innovations.

One of the most important sources of latency is consumers of innovation product. Their needs, perceived or not (until a certain period of time), are a source of formation of innovation latency. Needs and, surely, demands are a defining and main source that stipulates the formation of innovations' latency during the whole life-cycle. Demand is the factor which can increase the innovation's lifecycle and bring it to a new level. Another factor defining the significance of consumers as a source of innovations' latency is the fact that "you cannot satisfy needs because the higher they are, the more you are trying to overcome this level" (Shevchenko, n. d.).

Nowadays needs can be satisfied by a wide but unchanged range of goods and services. As a rule, attempts to change this range by introducing new products prove to be successful in 15-20% of cases. The remaining 80% do not resonate with consumers. In our opinion, identification of innovation opportunities and their further implementation can be much more economically effective than creation and promotion of new innovation products. Consumers will purchase an innovative product as soon as they have needs that this product is able to satisfy. Needs are not supported if they cannot be satisfied. It should be noted that the search for certain profit can also be hidden, just like need or necessity.

There are two types of needs:

Obvious needs, consumer’s expressed desire, necessity or intent to act.

Latent needs. They are hidden behind a consumer’s expressed problem, discontent, dissatisfaction or lack of knowledge about the existing needs (a consumer may need something they are not conscious or aware about).

There are the following ways to work with this source:

detecting the changes of existing consumers’ needs;

identifying latent needs;

defining the type of consumer;

getting feedback.

Need is not a constant value; it may change according to the situation. For example, being in a metropolitan city and having a certain sum of money, one may feel its lack due to high prices and inability to satisfy certain needs. But the situation drastically changes once you come to the provinces. There you can satisfy various needs and feel like a millionaire with the same sum of money. The above-mentioned means that the needs can be influenced and even formed.

Changes of existing needs of consumers can be related to the changes in perception, values, fashion. That said, the search for innovation latent potential can and should be conducted in the future as well as in the past. Future needs can be predicted on the basis of the present, which would allow to make the next step in changing the innovation before your competitors. Going back to the past allows using the accumulated experience in a new way. Identifying certain needs, the enterprise offers consumers what they need.

The identified latent needs will inform how you can improve and modify an innovative product by adding new qualities or changing their quantitative characteristics. For example, an innovative product can be improved by adding functional abilities of the actions that consumers do for the use and maintenance of the product, like tyre pressure sensor which allowed to develop a system of automatic air inflating.

Defining the type of consumer means dividing consumers into certain groups by specific characteristics and further thorough study of specific features of innovation product used by each group, which can provide information on how and where to look for latent opportunities and characteristics to create innovation products different from the initial ones. The information obtained in this way can give the developers original, unique engineering, technological, and design ideas.

Apart from the above-mentioned, feedback can play a very important role in the identification of innovation latency. Consumers can also generate new ideas and suggestions as they have the experience of using the product and thus are the best “test labs”. This may also give the ideas on search and implementation of latent potential of innovations. As the research shows, innovative solutions of companies are more attractive for consumers if the latter took part in their creation.

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4. Conclusions

Distinctive feature of innovation is ability to stay latent without showing up for a certain period of time. We suggest calling this innovations’ latency or latent potential of innovations, which under favourable circumstances can ensure long-term competitiveness of both the innovation and the enterprise.

Latent innovation potential implies existing but so far latent promising ideas to implement which one has to constantly look for them.

Having studied internal and external needs determining the search and implementation of innovation latency, we can say that internal and external needs widen the possible demand for

innovations. Moreover, the wider the demand becomes, the more opportunities there are, which is like a paradox by Socrates: “The more we learn, the less we know” (Paradox, n. d.).. The more knowledge and opportunities there are in an innovation, the more knowledge and opportunities are hidden and are there to find. The words by V.A. Obruchev also fit here: “The more we know, the more mysteries the nature gives us” (Obruchev 2014).

The wider the area of inner cognition and competitiveness is, the larger is the possible demand for innovation or area formed by the motives for search and implementation of innovations’ latency. At the same time, there is more place for new, still latent opportunities. In fact, we can mention the multiplication effect of innovations. In other words, the more innovations are created, the more opportunities are hidden in innovations and the greater their potential is.

The need for search and implementation of innovations’ latency originates from the state of dissatisfaction by existing characteristics and opportunities of innovation. The process of search and implementation of innovations’ latency is accompanied by constant change or transition of the state of needs. Search and implementation of innovations’ latency leads to the way of development based on satisfaction of existing needs, widening them, and creating new, previously unknown ones.

Therefore, latent innovation potential is a source of new innovations and a strategic factor of competitiveness of innovation and, as a result, of the enterprise’s competitiveness. The main sources of innovations’ latency are different internal and external needs. One of the most important tasks to be solved by industrial enterprises is constant search for new ideas and their implementation for the satisfaction of various needs.

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[Índice]