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**IMPROVEMENT OF THEORETICAL APPROACHES
TO DEVELOPMENT AND IMPLEMENTATION
IN INNOVATION PROCESS**

The process of innovation development and implementation in businesses of all areas of activity is the key to the successful operation and competitiveness of the products and services. Therefore, it is necessary to make the process as efficiently as possible, following the conditions and parameters of a particular company.

According to researchers such as A. Greenev [2], A. Koyuda [9], T. Lepeiko [10], S. Ilyenkova [6], and others an innovative process consists of the following steps: fundamental (basic) research – applied research – development – implementation. Some researchers [1, 4, 5, 7] add to the innovation process complementary steps that characterize the life cycle of innovation, namely growth – growth slowdown – decline in sales. For best results, carrying out of all these steps should be properly organized, and essence of each stage should be as much as possible clear.

In this article are considered two stages of the innovation process: development and implementation.

The next stage of the innovation process, after the stage of applied research, is the stage of development. This step serves as a transfer from the research part and the part of the innovation process, where innovation is finally being implemented into production. Thus, the development is the final stage of the research, in the process of which are used the results of applied research for the establishment or improvement of models of equipment, materials, technologies, tools. At this stage the final inspection is carried out of the results of theoretical research, relevant technical documentation is developed, samples of the new technology are manufactured and tested.

The development includes engineering activities (development of a specific object or technical system) and technological activities (development of ideas and variations of a new object, the development of the technical process,

i.e. ways of combining physical, chemical, technological, labor and other processes in the integral system).

This step provides an opportunity for company to significantly increase the results of its performance due to high levels of success and low cost compared with the stages of fundamental and applied research. The development can significantly increase competitiveness through diversification or product improvement, therefore, the realization of development has to take place in the most effective conditions and the correct sequence.

Sequence of developmental, offered by T. Lepeiko, V. Koyuda, S. Lukashov [10], looks in the following way:

- 1) Elaboration of technical specifications.
- 2) Elaboration of technical proposal with assigning documents with the letter "P".
- 3) Elaboration of outline draft with assigning documents with the letter "E", construction, making and laboratory testing of product model.
- 4) Elaboration of technical scheme with assigning documents with the letter "T", production and testing of models.
- 5) Elaboration of the working documentation.

Development process is considered according to the similar scheme by E. Kozlovsky, D. Demidenko, E. Yakovleva, M. Hajiyeva [8].

Such a comprehension of the development process is correctly and clearly for practical applications, but requires more clarification, so on the basis of existing sequence was proposed own one.

The authors suggest considering the development process in the context of the following sequence of actions:

- 1) Identification of product or technology weaknesses and consumers' wishes.
- 2) Elaboration of technical specifications.
- 3) Search for ready-made solution or its elements of the given problem.
- 4) Assumption nomination for carrying out the assignment.
- 5) Economic evaluation and selection of the most effective proposals.
- 6) Creation of the outline draft.
- 7) Verification the possibility of the carrying out the project.
- 8) Creation of the technological project.
- 9) Creation of the prototype based on the outline draft.
- 10) Carrying out of the basic tests.
- 11) Creating of the test batch according to drawbacks of the prototype.
- 12) Carrying out of the complete set of tests.

- 13) Refinement and correction of the potential problems.
- 14) Elaboration of the working documentation.

The need for development occurs, in addition, when the company is faced with the need of the elimination of the identified drawback in the provided product or service, or if it wants to diversify production to keep market share or improve finished commodity to meet the growing needs of consumers. To maintain a competitive advantage the search for possible shortcomings must be constant in any enterprise. Depending on the cause of the development appropriate technical specifications are elaborated, where basic requirements for the product are represented: the operating principles, construction features, dimensions, weight, performance, price, appearance. Then the search for ready-made solution or its elements is carried out in the market of similar products or among research results of other organizations, if the company does not conduct applied research singly. The proposals to the fulfillment of the posed technical specifications are formulated, which contain technical and economic substantiation of the expediency of product creation. The next step is to carry out economic analysis and evaluation of the proposals for cutting off unprofitable solutions and selection of the most promising ones, which can be selected for testing the realization as the component of the prototype. Further outline draft is made containing sketch drawings, circuit diagrams, calculation of basic performance indicators, which allows deciding the problem of the expediency of further work on the product. At the stage of outline draft "design" project is elaborated, the appearance, dimensions, basic construction elements, materials of the product are determined. Preparation based on the outline draft the technical project, consisting of a general type of construction in whole and of all the components, of the most complicated parts, of the explanatory note with technical and economical substantiation, of the calculation of operating costs. On the basis of the technological project product prototype is constructed on which it is necessary to carry out basic tests to identify common characteristics and capabilities. If certain deviations from the assignment or drawbacks are found, they are corrected in the test batch, on the elements of which complex test are carried out to determinate the safety and technical parameters of the product. Deficiencies and deviations that are found during testing are corrected or brought to the required magnitude. The final stage of development is elaboration of working documentation. In the documentation is included both graphical part – drawings and text part – documents.

The final stage of the innovation process is the stage of the implementation to the production. At this stage both the industrial development

of innovation and the technical and technological preparation of the equipment, productive capacity to producing of new goods or services are taking place. Also marketing program is developed at this stage.

Thus, this is the most important step in the innovation process, because the profit depends on how this stage will be carried out. Therefore, managers need to know exactly how to realize the implement stage of innovations effectively and efficiently.

In the scientific literature [1-12] stage of innovation implementation sufficiently elucidated, but there is no definite, specific sequence of the implementation realization, and the existing algorithms require further clarification.

In the handbook on innovation management edited by P. Zavlin [5] the following sequence of the last stage of the innovation process is proposed:

- 1) scientific development (testing the new (improved) product);
- 2) industrial development (pre-production);
- 3) production of new products (directly manufacturing);
- 4) selling of new products to consumers (bringing to consumers).

Such consideration of the implementation stage focuses on the essential aspects of this process, while the others, no less important are not affected, namely, market analysis and research as well as for the business it is the first step in solving the issue of the production of new products or entering new market. Also such consideration does not provide a test launch batch for more complete analysis of the market situation.

More extensive sequence is proposed by O. Koyuda and V. Kolesnichenko [9]. A distinctive feature of their sequence is the final step in the implementation process of innovations, which consists in the innovations diffusion that actually takes place in modern society:

- 1) Organizational and technical preparation. The authors suggest design, technological, logistical and organizational preparations for production at this stage to ensure the enterprise with capabilities for implementation);

- 2) Organizational preparation. At this stage take place output planning of new products, setup of relationships, reorganization of departments, creation of new ones, if it is necessary, the determination of business relations and scheme of payment.

- 3) Launching of production. That is complex of technical, organizational and economic activities to develop new product.

- 4) Current production management. Investing of the production.

5) Commercialization. It is implementation and receiving of economic benefits from the innovations.

6) Diffusion of innovations. It is widespread use of innovations in other companies, in new industries, regions, etc.

The implementation process of innovation, which does not have previously described shortcomings, is represented by M. John, V. Stadnik [7], T. Doudar and V. Melnicheko [4]:

1) market research. At this stage, the authors propose to study market readiness to accept innovation, to evaluate the possibility of formation of new consumer needs, which company can satisfy, to determine the form of promotion of new items on the market, the possibility of its modification for its separate segments.

2) construction. It is a formation of novelty design according to aesthetic, ergonomic, functional requirements and the preferences of consumers of the selected market segment, developing a marketing strategy to promote the product on the market;

3) market planning. It is a determination of demand for the new product, its product range, market opportunities, evaluating the costs of production and sales, forecasting future revenues from sales;

4) pilot production. To this stage can be referred recreating the technological process, setting up and testing production bottlenecks, budgeting costs;

5) market testing. It is launching advertisement, testing pilot batch in the market, evaluating of demand and customer satisfaction, changing the design, marketing tactics;

6) commercial production. This stage includes formation of the stock of orders for production; compilation of the contracts with suppliers and clients, development of logistics schemes, the choice of distribution channels, manufacturing and sales of products in the planned volumes, development of quality management system, improvement of pricing policies and methods of sales promotion.

Critical analysis of these sequences of the innovations implementation in production allowed making own sequence of actions which eliminates some disadvantages of the represented models and improves it as such. In summary, it can be represented as follows:

- 1) Test the possibility and actuality of implementation.
- 2) Construction of the sample.
- 3) Organizational preparation.

- 4) Pilot production.
- 5) The market test.
- 6) Revision of the product, strategy.
- 7) Full-scale production.
- 8) Monitoring of the market, wishes of consumers, product improvement.
- 9) Innovation diffusion.

The logic of compilation of the offered sequence of actions was following. Any implementation of any innovation must start with an analysis of the need for this innovation and its relevance in the foreseeable future, thereby reducing the risk of losses. If a decision on the innovation implementation was made, then the test sample of the innovative product needs to be constructed that would meet the requirements of both consumers and adequate opportunities of company and its image. Typically, this step is required if the product is not developed at the enterprise or by his order and due to the innovation diffusion was taken over by another company. Then preparation works carry out for the providing of the opportunity for fulfilling the novelty production. Before production beginning it is necessary to make a pilot batch and conduct a research of this batch in market conditions. Further, if it is necessary, the product or its promotion strategy is being modified. Then it is essential to pass to the stage of full-scale production. At this stage of the implementation process product is put into production and will be implemented, if properly have been passed the previous stages, but the process does not end because of the need to constantly monitor the innovation, the market situation and the changing preferences in order to improve product, while maintaining a competitive advantage. It also contributes to the cyclical nature of the innovation process when needs in the innovation activity arise on the stage of product commercialization that launch the innovation process from the beginning.

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Верещагіна Г.В., Кузнецов Є.А. Поліпшення теоретичних підходів до розробки і реалізації в інноваційному процесі. Детально розглянуті та проаналізовані етапи дослідно-конструкторських робіт та впровадження інновацій у рамках інноваційного процесу. На основі опрацьованих джерел запропоновані удосконалені послідовності проведення дослідно-конструкторських робіт та впровадження інновації на підприємствах.

Верещагина А.В., Кузнецов Е.А. Улучшение теоретических подходов к разработке и реализации в инновационном процессе. Детально рассмотрены и проанализированы этапы опытно-конструкторских работ и внедрения инноваций в рамках инновационного процесса. На основании изученных источников предложены усовершенствованные последовательности проведения опытно-конструкторских работ и внедрения инноваций на предприятиях.