

THE LIFE CYCLE OF INNOVATIONS AS THE MAIN FACTOR IN THE FORMATION OF THE CONCEPT OF CURRENTLY INNOVATIVE DEVELOPMENT

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ANNOTATION

A brief analysis of scientific research in the field of understanding the essence of the term innovation life cycle showed that there are several approaches to the definition of this term. At the root of this divergence of opinions lies a different understanding of the essence of the term "innovation", which, having the effect of a chain reaction, is transmitted to such concepts as the life cycle, the concept of life cycle. The lack of a consensus on the essence of the life cycle makes the research topic relevant. In the article, on the basis of a comparative analysis of the life cycle and life cycle, the difference between them is revealed, the definition of life cycle is given and its stages are determined.

Key words: *innovation, innovation life cycle, product life cycle, stages of life cycle, concept, "scallop" type of quality life cycle, effective management.*

Currently research on innovation is one of the priority areas. However, while we understand the importance of innovative development not only for the enterprise, but also for the country as a whole, there is a barrier that arises due to a lack of understanding of its essence and significance, associated with insufficient knowledge of the terminological and conceptual apparatus. It seriously interferes with the development of goals, objectives, and the concept of the innovation life cycle. A brief analysis of scientific research in the field of understanding the essence of the term innovation life cycle showed that there are several approaches to the definition of this term. At the root of this divergence of opinions lies a different understanding of the essence of the term "innovation", which, having the effect of a chain reaction, is transmitted to such concepts as the life cycle, the concept of life cycle.

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The concept of the life cycle of innovations (LCI) has a fundamentally important role in managing the implementation of innovations and in organizing the phases of the life cycle of innovations (LCI). The main factor in creating an effective concept is the life cycle. Therefore, it is necessary to determine the stages of the life cycle - how long an innovation exists on the market and when it ceases to be an innovation and turns into an ordinary product, living further stages of the product life cycle. As the analysis of definitions shows, the same tendency of disagreement is observed here as in the definition of the essence of innovation. For those who believe that innovation is a process of going through several stages, starting from the inception of an idea, the following definitions are characteristic:

“The life cycle of an innovation is the period of time from the inception of an idea to the withdrawal from production, an innovative product implemented on its basis” [4,6].

As can be seen from this definition, it contains at least 2 inaccuracies, including life cycle stages that are not related to innovation. First, in these definitions, the life cycle begins with an idea and goes through several more stages before the innovation appears on the market. The time period from an idea to a final product is the process of creating an innovation, and an innovation is a finished product. Therefore, in this definition, the life

cycle begins and includes the process of creating an innovation, and we need to consider only the life cycle of the innovation itself. Secondly, according to these definitions, the life cycle ends with the withdrawal of products from production, which means it is no longer an innovation, but not a popular product or product.

According to the above definition, in contrast to the life cycle of a product (LCP), associated exclusively with its viability in the market, in addition to market phases, the life cycle also includes a phase of searching and choosing ideas for creating an innovation, a phase of developing an innovation, a phase of testing it through laboratory tests and market tests. Therefore, the LCI becomes longer than the LCP and contains the following stages in Fig (1):

1. The origin of the idea. Her search and choice.
2. Development of innovation.
3. Laboratory tests.
4. Introduction of innovations to the market.
5. Growth.
6. Maturity.
7. Decline, leaving the market.



Figure: 1 Innovation life cycle, which includes the stages of the innovation creation process.

As can be seen from Fig. 1, the first 3 stages distinguish the LCI from the LCP. For example, A.N.Samoldin in his article "Life cycle of innovations", have considered the essence of life cycle, conducted a brief analysis of scientific research on this topic and proposed 9 stages of life cycle.

There are two more main points of view on the problem of the difference between the life cycle and the life cycle. Proponents of the first define the life cycle cycle as a set of time periods from the beginning of the emergence of an innovation on the market to product withdrawal from production and sale, arguing that the life cycle stages completely coincide with the life cycle cycle stages, since any product in a certain period of time is innovative and goes all the way from the stage development and ending with the stage of market decline. This opinion can be attributed to the following definition: "Life cycle is a period of time that begins from the moment an innovation appears on the market and ends at the moment of its complete exit from the market, during which the innovation goes through successive stages - growth, maturity, saturation, decline and exit" [5]. In such definitions, there are no stages in the innovation creation process in the life cycle. It starts with the stage of bringing the innovation to the market. However, nevertheless, as in the previous definitions, it ends with the stage of withdrawal of the product from production, which contradicts the essence of innovation, since the stage of withdrawal from production is associated with oversaturation of the market, the product ceases to be in demand, therefore, it is no longer an innovation.

The essence of the second point of view is that the life cycle is shorter than the life cycle. The life cycle ends as soon as the product passes from the stage of market stabilization to the stage of market reduction. This is due to the fact that an innovative product, by itself, is created with the aim of obtaining additional value (profit, anticipation, leadership, priority, fundamental improvement, quality superiority, creativity, progress), and at the stage of market decline, all these indicators noticeably decrease. Thus, the LCI and LCP do not completely coincide. The LCI ends earlier than the LCP [2].

Whatever the progressive and effective innovation, it has its own life cycle, after which it loses the property of innovation or novelty and turns into a well-known product or product familiar to the market, as a result of which it loses demand and interest, or it is pushed out of the market by the next innovation, with new competitive advantages. For example, this is observed in the market of cell phones, TVs, cars. Another thing is when the duration of the life cycle of each innovation is different. For some it is hundreds of years, while for others it is a month. Usually, a product goes through all stages of the life cycle, but the speed of passing each of them differs from product to product. For example, cigarettes in the form we are accustomed to appeared only in 1873, and the peak of sales was in 1973 (the life cycle of more than 100 years), while the entire life cycle of the toy "ninja turtle" took only two years. Or you can recall pagers, the life cycle of which was also not very long (5-7 years), then pagers were replaced everywhere by mobile phones.

A brief analysis of opinions allows us to make the following conclusion - the life cycle of an innovation (LCI) and the life cycle of a product (LCP) are very similar and have common stages of development, but the LCP is much shorter. LCT - the period from the moment of the initial appearance of a product on the market until the termination of its sale in this market. The life cycle describes changes in sales volume and profit indicators over time and consists of the following stages: the beginning of sales (introduction to the market), growth, maturity (saturation) and recession (Fig. 2).

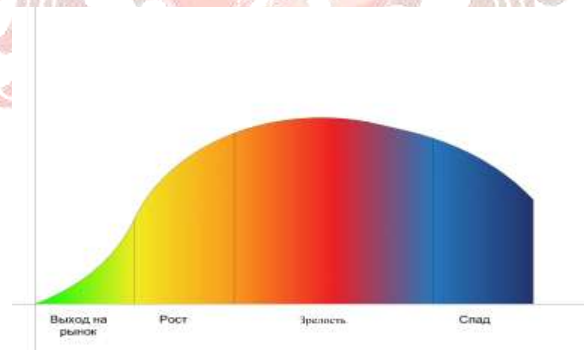
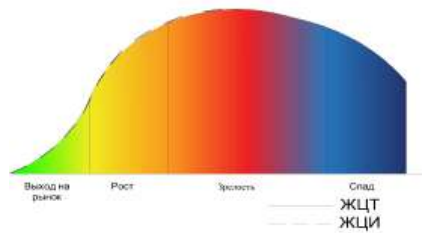


Fig 2. Product life cycle

The life cycle is a period of time during which an innovation has an active life, generates demand, gives a competitive advantage, has a perspective for development and makes a profit. Consequently, innovations have a very short life cycle, which consists of 3 stages: implementation, growth and maturity, and at the end of 3 stages it ceases to exist due to the loss of its main property and characteristics - novelty. This can be clearly shown in Figure 4, where the VCI is highlighted with a dotted line. (Fig. 3).



Fig 3. Life cycle of innovation



Consider the stages of the life cycle:

1. Implementation of innovation. The production, release and sale of a new product takes place, the process of its independent functioning begins. This stage is complex and important, as the prospects and profitability of the innovation will depend on the importance, necessity and scope of the new invention. Large sums are spent on its development and release.

2. Growth in sales and profits. If the innovation interests consumers and finds its consumers, then a new stage of life cycle begins - growth. The profit received from the sale grows, reaching the payback period. The duration of the period lasts while the innovation is in high demand, until the moment when the market becomes saturated.

3. Maturity (sales and profits grow, but more slowly). This stage of the life cycle is characterized by the fact that the market begins to be saturated with innovation, the growth of sales stops due to reaching the limit. The sales are stable and provide the necessary profit. Sales growth is provided either by a small flow of new customers, or by an increase in the volume of purchased product by regular customers.

This point of view is well described by Soren Kaplan in his article "The Life Cycle of Innovation" describes the structure of the life cycle, arguing that the life cycle is represented as a curve S. (Fig. 4)

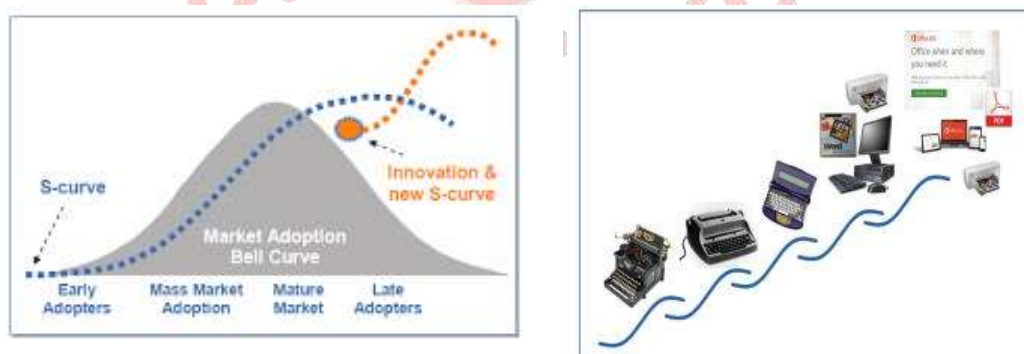


Fig 4. Life cycle of S. Kaplan's innovation

S-curves show how innovation evolves over time, while the life cycle of a product is a bell-shaped curve. The beginning of the S-curve corresponds to the emergence of new market opportunities, while the end represents the death or obsolescence of a product, service, or technology in the market. As a rule, the end of the S-curve means the appearance of a new S-curve, i.e. anything replacing the previous innovative product. Some industries and technologies are moving faster on S-curves than others. S-curves of hi-tech products change more quickly than others.

Based on the above brief analysis and clarification of the essence of the life cycle, it is possible to determine the role of the concept of life cycle, which is as follows:

- CLCI is the basis for analysis and planning of innovation implementation. When analyzing the life cycle, the stage is established, what is the nearest perspective, when saturation begins and the innovation ends its existence;
- CLCI provides for several phases of LCI, manages their relationship, the timely release of one LCI and the introduction of the next, which is not possible without analyzing economic activity, both from the standpoint of the present time and from the point of view of the prospects for its development;
- the concept of the life cycle of innovation justifies the need for systematic work on planning, organizing, creating innovations, as well as on the timely implementation of the next innovation.

CLCI should be as follows. At the stage of saturation, in order to maintain the competitive position of an enterprise in the market, it is advisable to introduce innovation to the market. This process can be schematically represented in the form of a "comb diagram". CLCI resembles a "comb" type of LCP. The scallop CLCI curve suggests that in the middle of the maturity stage, the market begins to saturate with a product, and managers take a number of steps in order to ensure a smooth transition from LCI1 to LCI2, or from phase 1 to 2, from phase 2 to the third, and so on. The level of demand for the introduced innovation is ensured by timely advertising, telling about the advantages of the introduced innovation from the previous one, allowing to avoid or reduce the first two stages of life cycle - this is implementation and growth. To manage efficiently the timely introduction of innovations into the market is the creation of CLCI and it looks like this fig. 5.



Fig 5. Concept of innovative management

Effective innovation management is the process of successfully rotating these phases.

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