



Stages of Innovative Production in the Traditional Factory

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Abstract. The majority of enterprises are to introduce innovative production for sustainable development. According to the authors, modern Russian enterprises face the challenge of a radical update. Enterprises around the world need to learn how to produce high-demand, high-quality products, electric cars and electric scooters. The authors believe that 3D-printers of various types, various gadgets with more and more advanced characteristics, the latest medical devices are becoming more and more in demand. The purpose of the study is to develop an implementation strategy for innovative production in traditional factories. The study presents the strategy for the transition to innovative production that is in demand in various countries of the world today. The authors propose a basic formula that can calculate the necessary amount of investment required for the transition to innovative production.

Keywords: High-tech products · Innovation · Investments · Management · Strategy

1 Introduction

The modern world is a world of changing technologies, a world of breakthrough in various fields, the world of innovation. Production of innovative products is the opportunity to receive high profits, the ability to successfully compete with the best transnational companies of the world in various markets, the opportunity to attract the best highly skilled workers from around the world. For example, the Alphabet Corporation receives 1 million resumes every year and all creative people want to work here. Production of 3D-printers, electric cars, various gadgets, space rockets, medical equipment - all these goods are extremely in demand in various markets. The main problem is that factories producing unclaimed, rapidly aging product is to answer the question - how quickly and without devastating consequences to go to innovative production and therefore regain competitive positions. The purpose of the study is to introduce innovative production in a traditional factory with outdated equipment and producing unclaimed products. The authors will consider the introduction of innovative production in a traditional factory as a sequential process consisting of certain stages, as well as requiring certain investments, which will be calculated by the determined basic formula.

2 Methodology

Research methods are system analysis, structural-functional method, analogy method and expert assessment. At the first stage, a systematic analysis, a method of analogies, and expert assessment were used to form a consistent strategy for the transition to innovative production. At the second stage, a structural-functional method and expert assessment were used to determine a basic investment formula that is necessary for the introduction of innovative production.

3 Results

3.1 Theoretical Basis of the Considered Issues

Today Russia has signs of a rather serious socio-economic crisis. The reasons for this crisis are the inability of the former raw material model of the economy to work effectively and attract investment. At this stage, it becomes clear that the Russian economy needs deep-seated structural reforms, a new economic model should be based on high-tech products, like those of Japan or South Korea. The gross regional product of one state in California (at the expense of Silicon Valley, which is located in the territory of this state) is almost twice as large as Russia's GDP. In the modern world, organizations benefit from high-tech, high-quality products that have a stable demand [20]. As an example, look at the activities of Apple, the capitalization of this company as of September 2018 has already exceeded \$ 1 trillion. The pre-sale presentation clips of this company collect millions of views, and the products of this company are in crazy demand. Huge queues for new products from Apple are in New York, Moscow, Berlin, London and Melbourne. It is also necessary to take into account that the products of this company are extremely expensive (at least for Russians), but their high-tech component attracts everyone's attention. Taking into account the experience of such successful projects is the most important task of any manager. The technological project is one of the main activities when getting ready for innovations, modernization or reconstruction of production. The technological project is the first model in the structure of future production, which allows modeling future production, including its economic consequences. The technological project is a system of activities related to the analysis, planning, design and visualization of new, extended, reconstructed and modernized production facilities or parts thereof [10].

The innovative development strategy for any traditional factory should begin with the definition of the basis for development. At the heart of this development is the fact that products manufactured before are no longer in demand and they do not meet the requirements of consumers. A new challenge is the development of an organization through innovative high-tech products [13]. As an example, we can mention the founder of SpaceX and Tesla companies, the American billionaire Ilona Mask. Today, his projects, which only recently seemed to be science fiction, are actively being carried out. The newest project - Hyperloop, a vacuum superfast train, has interested a variety of countries, including Russia. The construction options for the Hyperloop tunnel in the Far East, as well as between Moscow and Kazan, are being considered. Using the

example of Tesla, you can see and explore Ilona Mask's step-by-step strategy. Its strategy has the following components:

1. Develop a plan, a project. Even if it is unrealizable from the standpoint of individual skeptics, who are always here when it comes to innovation, in fact it is "non-Luddite" [17]. Consider the possible demand for the product produced by the project. Study social and economic efficiency. For example, the social efficiency of Tesla electric vehicles is that the urban environment is improving due to the absence of emissions to the atmosphere.
2. Form a team of like-minded people with creative, courageous, extraordinary thinking. A cool team of highly qualified specialists is the basis for the project (startup) promotion. To implement Tesla Motors I. Mask gathered the best automotive industry specialists from the USA and Canada.
3. Search for the place of production. Ilona Mask's company bought an abandoned automobile factory on the edge of Silicon Valley and turned it into a super-technological and extremely robotic factory to produce electric vehicles.
4. Launch a test unit production of an innovative product with a high cost, then mass production. Finally, if it is successful, there is mass production of an innovative product with a relative low price for the consumer. The first Tesla electric cars were extremely expensive, about 50 thousand dollars. Subsequently, the company started mass production of relatively cheap electric vehicles worth \$ 35 thousand. In the US, there are government subsidies for buyers of electric vehicles, so Tesla Model 3 will cost even less than 35 thousand dollars. New Tesla will cost even less - 21 thousand dollars.
5. Expand markets. Tesla has announced the construction of factories in Germany and China. The world is expanding the network of free gas stations equipped with solar panels. The number of consumers of electric vehicles is growing in the countries of the world. Today, there is a boom of electric cars in the United States, Norway, Canada, Japan, Thailand and South Korea.

A similar strategy of success in promoting an innovative product can also be used in developing the innovative development strategy for any traditional enterprise.

3.2 The Strategy of Creating Innovative Production at a Traditional Enterprise

At present, the developed countries of the world experience a real technological boom, when all new innovative developments in various fields of activity change the previous approaches. If earlier the most important factor in the development of the economy of many countries was mineral resources (oil, gas, ore, etc.), now creative individuals and teams capable of creating breakthrough innovations have come to the fore [7]. Until recently, many innovations seemed fiction but they are already firmly entering the everyday life of people in different countries of the world. These are electric cars and electric scooters, 3D printers, various gadgets with more and more advanced features, online trading, blockchain technology and newest medical products [3, 5]. These innovative developments are drivers of economic growth in their countries and regions. One of these major innovation technology centers is Silicon Valley in California. In a

situation when the technological revolution is before our eyes, we cannot stand aside. It is necessary to ensure a technological boom, a breakthrough growth of the entire economy by promoting innovation on the territory of the entire Russian Federation.

We can insure ourselves against excessive risks of mineral depletion using the example of Bashkir Soda Company located in Sterlitamak. Today, the company experiences a shortage of minerals for its production. The problem is so serious that the management of the company is going to have massive reductions and even close its production. To ensure sustainable development of the company, it is proposed to create an additional division that will be focused on high-tech electrical products [4].

First, you need to understand the idea of the project. In our case, it would be extremely interesting to establish a very popular production of electric cars today. Today, the boom of electric vehicles is observed in the USA, Canada, Norway, China and the EU countries. The leader is I. Mask's successful project, which has become a successful multinational corporation Tesla. There is a study of the successful production of electric cars and electric buses in Shenzhen with the support of the state [12]. Another possible project is to launch a line producing 3d-construction printers that allow printing cheap houses and offices.

At the second stage, it is necessary to have a team that will implement the project. The project requires highly qualified specialists who are able to work in a team, ambitious and not conflict. The "head hunters" of enterprises need to pay attention to local universities where there are often many undervalued potential employees - students and teachers. Many companies, which are currently at the top of the capitalization rating, were created by ordinary students (Apple, Alphabet, Microsoft, etc.). Denote the key provisions of the strategy following the example of the Tesla strategy:

1. Define the innovative image of the traditional enterprise and the beginning of its positioning as an innovative company which is open to "smart" investments and to interesting developments [14]. Develop aggressive marketing aimed at promoting a new company image; targeted advertising of new products, aimed at young people. Use sports and movies stars in commercials.
2. Invest into the company's human capital - investments in training, medical services, assistance in purchasing housing and developing infrastructure. This will attract creatively thinking, well-educated and healthy people who will be interested in innovative breakthrough projects [9]. In 2018, the article described the impact of employee creativity on innovative solutions within the company. The described problem is an important issue in the field of production [19].
3. Create places for creative, intellectual work - technology parks, coworking on the territory of the company. Attract investment and create opportunities for real business angels.
4. Produce the first high-tech products, if successful, increase production volumes. It is great to have the support of the state, which is interested in high-tech products, especially against the background of sanctions. It is possible to start production of electric scooters, phones, tablets, laptops, 3D printers of various types, including construction ones.

5. Enter the market of other regions, and subsequently of other countries. Here you need to take advantage of online commerce. The most striking example is the Chinese one, and now the international platform Alibaba. Here you can buy anything from a flashlight to powerful laptops. Such a platform for the promotion of high-tech products will attract their customers in various countries around the world.

3.3 Formula for Calculating the Investment Required to Launch Innovative Production

The authors determine a formula that will allow calculating the amount of investments necessary to create a new unit. To create a unit, there are costs for the project team and additional staff training (costs on them are $S1$), as well as costs for attracting highly qualified employees from outside, who could act as consultants for launching new equipment ($S2$) and costs for management activities ($S3$). In addition, it is necessary to purchase equipment that will launch a new production line at the enterprise. This is the most significant part of costs, $C1$. Very important costs are for developing new high-tech products, $T1$, which include costs for creating a special open space environment (a kind of coworking city) that will encourage employees to think creatively and create innovative products. For a sample, you can take a coworking city Facebook or Alphabet: cozy parks, coworking, recreation, which would become the place of work of the project team. Refining urban spaces will be an additional social bonus for all residents of the city in which this city-forming enterprise is located. One should not forget about a variety of risks that will accompany updating, including the risks of increased inflation and deterioration of the macroeconomic situation due to external sanction pressure, which have been growing lately, R .

Add up all the costs for a new production department that produces high-tech products and the total cost (TC) is the following:

$$TC = S1 + S2 + S3 + C1 + T1 + R \quad (1)$$

The most important question is where you can get the funds to launch such a costly but extremely necessary project for sustainable development of the enterprise. The answer is to attract investors from all over the world, as well as lobbying the possibility of obtaining government subsidies in government circles. This requires good marketing, an open, interesting guide for investors and IPO.

4 Discussion

The scientific literature does not pay enough attention to innovative production at traditional enterprises. In general, the introduction of the digital economy is considered at small and medium-sized enterprises in the US. It is also argued that the digital revolution will ensure mass production of innovations [2]. There is a study that indicates the irreversible transition to the digital economy, as well as the fact that Russia is no exception in this regard [8]. The same study emphasizes the fact that information technologies are being actively implemented in all Russian sectors of the economy, and

thanks to this process, enterprises need to change their organizational structure. In addition, it points out the various advantages of using information and communication technologies for sustainable development of enterprises and organizations in modern Russia [8]. In another study, it is indicated that the world is becoming increasingly digital. In fact, the era of “smart production” is coming when it should become extremely adaptive [1]. There is an interesting study concerning the assessment tool for innovative production; a method assessing innovative aspects in production development projects is developed [11]. Seyoum Eshetu Birkie writes that nowadays businessmen face changes. In order to remain competitive it is necessary to introduce innovations in business models, namely innovations provide a mechanism for strategic renewal. However, we have only a few studies that are devoted to such challenges in sustainable production systems [6]. There are articles that affect the need for innovation for entire regions or countries.

One study emphasizes the need for Russia’s transition to a knowledge-based economy, high-tech products, high technology and intensive innovation, and this requires the transformation of the higher education system and the formation of entrepreneurial universities. An analysis of the higher education system in Russia has shown that the development of universities is contrary to the global educational trends and the social and economic priorities of Russia. High efficiency of cluster policy in the leading countries of the world has led to the promotion of initiatives in the field of innovative development of regional clusters.

The results of econometric analysis show that the presence of a strong university as an “anchor” increases the influence of innovative factors on the socio-economic development of regions. The formation of innovation clusters in the regions of Russia requires “strong” universities that are engaged in applied and basic research, work with industry and introduce knowledge into practice [16]. Jorge A. Heredia Pérez is developing a new framework for analyzing internal and external factors that influence the types of innovations and their relationship with business efficiency in the manufacturing sector. The proposed theoretical model is tested and used to assess the innovation process in countries (Peru and Chile) and companies by size, industry type, financial aspects and level of patenting. In Chile, drivers are technological innovations in processes, while in Peru they are non-technological innovations. Foreign investment is very important when developing innovations [15]. The article of 2017 states that innovative production allows for cleaner, environmentally friendly production that ensures sustainable development of the company [18].

5 Conclusion

The introduction of the additional division producing innovative high-tech products at the enterprise based on the digital economy is an important basis for a sustainable growth strategy of the traditional enterprise. In the future, the range of manufactured high-tech products expands, and the range of obsolete, unclaimed products decreases. Due to online sales, the enterprise will expand the market, enters the markets of foreign countries. This strategy will provide the former traditional enterprise, far from innovation, with high competitiveness in the battle against the giants - Apple, Alphabet, Tesla, Amazon, etc.

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