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CONCEPTUAL ASPECTS OF MARKETING READINESS LEVEL ASSESSMENT MODEL

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ABSTRACT

The article provides the author's view on knowledge and information conversion process aimed at bringing out competitive innovations. Besides, in this paper we shall present the main types of modern expert and test methods related to technological innovations development and implementation process management, as well as high-tech innovative projects implementation risk reduction. It is noted that success of innovative activities now largely depends on the well-organized marketing activities due to the increased exactingness of potential customers, and to the problem of overchoice.

By analogy with the well-known method of technology readiness level assessment, a conceptually new approach of marketing readiness level assessment for technological innovations is hereby developed and proposed. Each of the proposed readiness levels is given a benchmark and a description. Provided that if the approach to marketing readiness level assessment proposed in the article is skillfully applied, it can help reduce the risks of innovation process and technological entrepreneurship, make positive contribution to the overall success of development and introduction of advanced breakthrough technologies. It is concluded that involvement of potential customers into technological innovation production process is necessary at relatively early marketing readiness levels.

INTRODUCTION

The essence of marketing, question of its interpretation and its dissimilarity from sales and advertising were studied by many well-known economists who devoted a number of scientific studies to these problems (Medvedeva 2013, p. 4). Thus, American economist T. Levitt, the recognized marketing guru, pointed out that the difference between sales and marketing is that *the sale is a disposal of what you own, whereas marketing is a possession of what people want*. This suggests that the main function of marketing is not just support of the existing goods and services but is mostly in their potential promotion.

In the era of widespread marketing the consumers have expanded their needs from banal desire for convenience and security to a higher level of satisfaction of personal needs. Consumers are becoming much more demanding; they want to get not just goods and services, but only those that meet their personal preferences. They want to be fully informed on their own procurements; in particular, more and more residents of the developed countries are seeking to environmentally friendly products consumption. Consumers directly affect the companies with the help of consumerism – an organized movement for the protection, expansion and strengthening of their rights. Through the mass media they are putting pressure on the government urging it to strengthen control and adopt more effective measures to protect consumers' rights.

In addition to more demanding consumers modern economy also faces an overchoice problem. This concept was introduced by famous futurist A. Toffler (Toffler 1970, p. 264). It reflects the prevailing complexity of consumer choice in view of wide range of similar products meeting the same requirements. A prime example of overchoice phenomenon is the electronics market, flooded during period of 1998-2003 with more products than during the whole history of the industry.

Due to the occurred social and cultural changes, globalization, and in connection with the transition of the leading countries to the new post-industrial phase of development, traditional methods of business management, marketing and sales activities forecasting were no longer optimal for the whole class of economic entities. There appeared a need in consideration of various factors that were previously of no value. Under the influence of

growing customer needs the creation of goods and services became topical problem (Uturity-Vrubliauskiene and Linkevicius 2011, p. 446). In this situation, the main role was given to the creation and commercialization of innovations possessing scientific and technical novelty, as well as the creation of special innovation infrastructure (Brutyan 2013, p. 57). This was the main problem, which innovations were aimed at, and which should direct the innovation process in modern conditions.

MATERIALS AND METHODS

The new economics is based on postindustrial techno-economic paradigm in which a steady sustained growth can be achieved through achievements in scientific and technical spheres. However, new technologies cannot be taken from scratch, they depend on existing knowledge and gained information.

In this regard, modern society development is based on new knowledge, information, ideas and concepts. Gain of the necessary amount of knowledge and information leads to generation of new technologies and innovations. The process of conversion of knowledge and information into competitive innovation is presented in form of a scheme in the *Figure 1*:

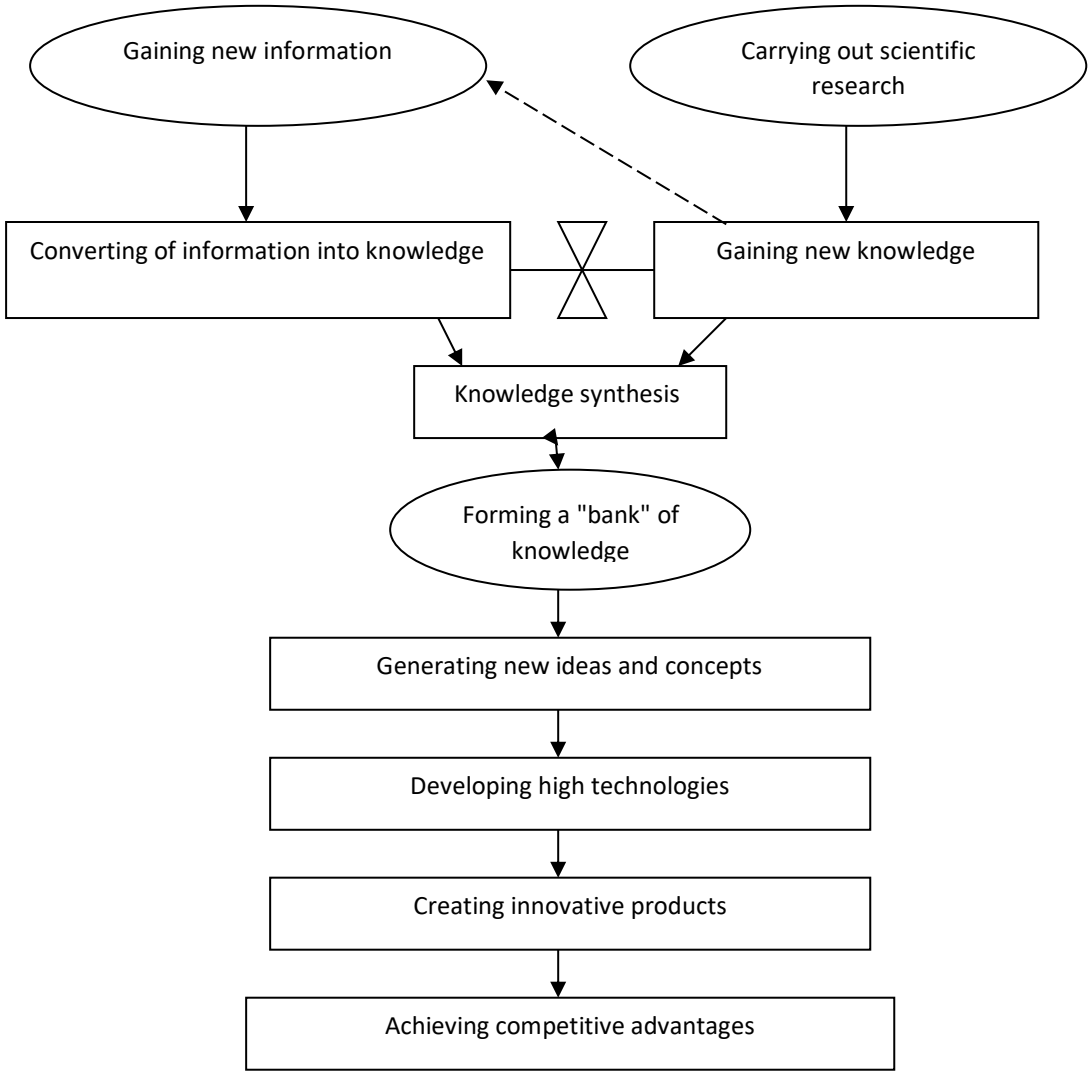

Figure 1. Conversion of knowledge and information into innovation

As shown in the *Figure 1*, at first stage information and knowledge are collected. Moreover, new information can be obtained either on a basis of scientific researches (more precisely, new knowledge derived from science), or without use of scientific methods of knowledge obtaining, for example, by means of certain practical actions, communication, observation, reading, etc. Information that can be converted into knowledge shall be compared with previously obtained knowledge. On the basis of this comparison new knowledge can be obtained and boundaries of existing knowledge can be expanded. Then, based on the synthesis of knowledge, a "knowledge bank" is formed to become a ground for inventive and innovative activities. Further, based on the new original ideas and concepts put forward advanced high technologies are developed; they can be then transformed into an innovative product, which, in its turn, allows the company to either maintain its competitive advantage, or achieve an even higher level of competitiveness. In this case, the company, in fact, becomes a monopolist displacing all other competitors from its market segment.

The important role of catalyst factor in the process of converting knowledge and information into innovation shall be given to marketing. Through marketing research valuable information on markets and consumers, existing demand, competitors, predicted possible external reaction to the product is developed. The received information is eventually reflected in the product concept, design, development features, market presentation, appropriate promotional activities, etc. We can say that with the help of market research specific information and knowledge are extracted to become basis for marketing innovations. It can be concluded that knowledge and information are the basis not only for product and process technological innovation, but also for other kinds of innovation: marketing, management, environmental, strategic, value, etc.

Knowledge provides the ability for some action, otherwise it is of little use. Relations between knowledge and actions have been identified and studied in the American philosophical doctrine - pragmatism. W. James put forward the thesis that if the idea is valid, it is true (James 1907, p. 58). J. Dewey believed that the idea must be translated into practice, transforming the world in which we live, otherwise it is useless (Dewey 1929, p. 7). Therefore, through actions we can receive new information and new knowledge. There are *explicit knowledge* which can be expressed in words, numbers, formulas, algorithmic processes and *tacit knowledge*, existing at individual level, extremely difficult to be expressed in verbal or in writing. Explicit knowledge can be obtained theoretically or experimentally on the basis of fundamental and applied research, and then can be set forth in books and included to computer databases. Tacit knowledge is usually accumulated through personal experience of the individual, especially its sensory perception, emotion and intuition. Traditionally it is assumed that western companies are paying more attention to explicit knowledge, and eastern companies to tacit knowledge. Having passed relevant stages of transformation, tacit knowledge can ultimately be processed into an explicit, and vice versa. Collection of all kinds of information as well as of knowledge is very important for the development of particular company. Thus, W. Ashby believed that in order to withstand the environment, a variety of information within an organization must comply with the diversity and complexity of the information of the environment (Ashby 1957, p. 245).

Currently the ability of sectors of the world national economies to successfully produce and/or simulate technological innovations is a major source of their wealth. According to various estimates the contribution of scientific and technological progress (STP) is 75-100% in the gross domestic product of most developed countries. The growth of information and knowledge can be called a primary reason for STP. Knowledge is a selective, harmonized understanding of the essence, objective causes of a phenomenon or process, and on this basis, the capacity for certain actions. The first person who successfully determined the concept of "knowledge" was Plato, he wrote that the knowledge is nothing but an idea proved to be true. The fundamental difference between the knowledge and the information is that information is raw, unstructured knowledge that can distort the facts and evidence on which it is based. This thesis is confirmed by the definition of information given by the founder of cybernetics, N. Wiener. In his opinion, the information is a designation of the content received by us from the outness in the process of adaptation of ourselves and our feelings to this outness (Wiener 1958, p. 303).

Western philosophy identifies two ways of learning: through rational reasoning and empirically, through experience and feelings. The first method of learning involves the use of deductive method – the construction of theory, use of learning methodology based on the principle "from general to particular". In this case, the truth is

formed from rational reasoning based on axioms. Mathematics may be an example of this. The second method, in contrast, relies on induction – knowledge based on the principle "from particular to general", and the consciousness of the cognizer shall be like a *tabula rasa* (a clean sheet of paper). An example of empirical learning method is experimental sciences. In the West a clear separation between subject and object of knowledge, consciousness and matter, the so-called Cartesian dualism, has historically taken root.

As it was already mentioned, at the present moment knowledge is the main factor contributing to economic growth. Production and accumulation of new knowledge is a kind of engine of the innovation process, stimulating the introduction of various innovations. Modern information society objectively requires innovations in various spheres of social life, designed to solve many relevant objectives and pressing problems. For successful introduction of innovations the main stages of innovation cycle shall be carefully identified and clear guidelines for conduction of appropriate innovation management and marketing shall be formulated. In this regard there is a need to develop appropriate tools to support the process of creating innovative products. Thus it is necessary to distinguish the concept of "effectiveness" from the concept of "efficiency" in innovation activity. The efficiency is associated with the ability to make necessary, right products, and the effectiveness is associated with the ability to create these products in the right way. In other words, the impact of innovation does not necessarily imply commercial viability of an innovative product, although it may signal the social efficiency, while the efficiency is related to, above all, the commercial effectiveness of the product.

Current trend to reduce the life cycle of products places high demands to compacting development and marketing implementation time schedule. The need to properly assess the technological readiness of the product and its market potential throughout the entire development cycle is critical. Due to the diversity of various innovative technologies the creation of a unified approach to the understanding and evaluation of the marketing maturity of innovation has become increasingly important. The realities of modern market relations show that even the most promising innovative products and services quickly fall in price and demand upon entering market. As a result, the product life cycle is significantly reduced, which forces engineers and designers to compact development timeline. Due to the fact that time for a new product to enter the market is limited, there is a significant risk of loss for companies that are planning to introduce new technologies into their product lines. This problem is especially urgent in case of system production development, with a complex modular architecture, where multiple technologies are integrated into a single unit.

In this case the most important role in innovation management is given to understanding of the dependencies between the individual parts of the system (subsystems and components) and the essence of the whole system. It is often necessary to analyze a large number of evolving technology options to understand how changes in one part of the system affect the characteristics of the other part. In this case, great attention should be paid to the efficiency of mutual integration of innovative technologies. Companies focused on innovation, should be especially prepared for the use of modular system architecture of a product.

At implementation of complex system of high-tech products marketing management shall take into account possible effects of the mutual integration of the developed technologies. In this case, from the entire set of available technologies it is necessary to choose those of technologies which when combined will not only be the most effective from the technical point of view but also will have the greatest market potential for profit generating.

Role of marketing in innovation development process

Innovation related to the creation of new types of products, technologies and services, is in its essence, a risky process. According to some reports only 2% to 10% of new ideas are eventually implemented in the form of the successfully sold product. There are a number of examples of when developers design and implement a splendid product from a technological point of view, but which in the end turns out to be unclaimed by consumers due to the high cost or non-compliance with their needs. It turns out that society sometimes rejects excellent creative results and original ideas that for an indefinite period lose the possibility of further development. This is called "freezing effect". This effect is described, for example, in (Fenn and Raskino 2008, p. 10). Therefore, researchers

and managers of innovative projects and programs have an objective interest in specific marketing approaches that will increase sales efficiency and improve the positioning of the product on different markets.

In accordance with the definition of US Marketing Association, marketing is the activity, set of institutions, and processes for creating, communicating, delivering, and exchanging offerings that have value for customers, clients, partners, and society at large. Marketing allows translating of operational results of the company into financial (Alashkevich et al. 2015, p. 235). A marketing process is directly linked to the activities of a company on giving a certain value to its products or services for customers, building a system of strong relationships with customers, creating customer base for the purpose of subsequent profit. For the most successful large companies marketing is the most important function, which the organization's success largely depends on. With the help of market research specific information about current opportunities and major product sales challenges is developed. An important role thereby is given to the continuous monitoring and evaluation of the effectiveness of current marketing activities, as well as to the search of ways to improve them and to original marketing ideas and concepts generating. We can say that marketing research is a kind of tool, linking consumers, marketers and society together at informational level. Integration of marketing research results to the innovation process increases the efficiency of economic activities of the company and the marketing system itself assumes an innovative character and becomes an integral part of the innovation process covering all its steps and stages.

According to the existing approaches, innovations are classified according to a wide range of features, depending on many factors (Goncharenko and Arutyunov 2009, p. 31). In recent years, innovations are often divided into radical and incremental associated with a gradual change of an existing product, its modification. Marketing comparisons for the main types of innovations featured data are presented in the *Table 1*.

Table 1. Main differences between incremental and radical innovations from the perspective of marketing [Sandberg, 2008, p. 76]

Innovation type	**Consumer segment**	**Competitive advantage**	**Marketing strategy**
Incremental	Existing market demand and consumers	Incumbent companies	Traditional
Radical	Latent demand (sales market is not specifically defined)	Innovator (new player in the market)	Innovative

As it is shown in the *Table 1*, marketing strategies for incremental and radical innovations are strikingly different. Incremental innovation is not trying to "blow up the market"; it is generally not focused on the creation of new markets and search for new consumers. The main goal of marketing strategy for this type of innovation is preservation of current market parity (*status quo*), or improvement of the company status and its positioning by means of costs reducing, minor technological modifications and improvements in product quality or service, increase of sales. For these purposes the traditional marketing strategy is usually applied. Radical innovation, in contrast, involves the use of an innovative marketing strategy. It should be remembered that the main value of radical innovations is implemented in case if a company succeed to create a new market with new consumers. Therefore, during the development of this kind of innovation there shall be represented as accurately as possible all the hidden (and often still not formulated) needs of certain population which is considered potential consumers. If the company fails to create a new market, or at least to find a new market segment for radical innovations, it is likely to be doomed to failure. This is partly due to the fact that competition in existing markets is quite hard, and consumers are spoiled by an abundance of proposals from competing companies. Competitive advantage over other companies in such markets is usually achieved through incremental innovation, costs reduction, strengthening of the existing brand, etc. Potential markets and new consumers are, figuratively speaking, the calm waters of the "blue ocean" where there is no tough competition, and it is possible to gain stable profit from massive sales of innovation in case of success.

Existing consumers are of the main value for the company in the implementation of incremental or supporting innovations. Therefore, current company shall consider their needs and opinions first of all. In case of the

development and implementation of radical innovation situation varies greatly. Thus, future consumer groups of radical innovations markedly differ from the existing consumer groups of operating companies. In this regard, focus on opinion of existing consumers in order to create radical innovations may lead to its complete failure at the stage of presentation on the market. It should also be taken into account that ordinary consumers are usually more interested in innovation, which meets their requirements in a convenient and simple manner, so technologically sophisticated innovation with lots of features will rather fail. Even radical innovation shall be developed in a simplest possible way and be easy for understanding by ordinary consumers.

XXI century abounds with various innovative technologies and products, and their diversity is increasing. As you know, all the technologies, products and services, with a few exceptions, have a limited life span, which has a tendency to decrease in modern conditions. The life cycle of any product covers time period from the start of research and development to the total elimination of its production and cessation of sales on the market (Bovin, Cherednikova, and Yakimovich 2008, p. 59). Innovative process of the creation of high-tech innovations "from scratch" requires special approaches and, of course, smart strategic management. This need is conditioned by a high risk of such projects and, as a consequence, by low probability of successful commercialization.

It is currently known a number of expert and test methods to assess technologies (TRL) (Akhmetova et al. 2015, p. 12), manufacturing (MRL) (Morgan 2006, p. 5), logistics (LRL) (Broadus 2005, p. 6), software (SWRL) (Blanchette, Albert, and Garcia-Miller 2010, p. 16), demand (DRL) (Paun 2011, p. 3) businesses (BRL) (Patterson 2006, p. 3.) integration (IRL) and technology system (SRL) (Sauser et al. 2008, p. 680) readiness level. These techniques have been developed on the basis of modern expert and test approach to innovative technologies readiness level assessment proposed and described in detail in (Mankins 1995, p. 1) to assess the maturity of aviation and space technologies. Such expert and test methods relating to the assessment of maturity of various aspects of innovative product creation are becoming more and more popular management practices. For example, 58 different expert and test methods for maturity assessing are listed in (Nolte and Kruse 2011, p. 2), but, at the same time, it is noted that only some of them can actually be used as a kind of metrics for new technologies readiness level assessment. At this, a clear problem with the recent trend towards the use of new, not explicitly defined and poorly articulated readiness level assessment techniques as a tool for measuring the technological innovation project or program was revealed. Therefore, in order to choose a method of maturity assessment the one shall know as much as possible on the common methodology, features and limits of its application, for it to be really useful and effective tool in innovation management.

RESULTS AND DISCUSSION

It is remarkable that among the already well-known expert and testing approaches of maturity assessment, there is no method of direct marketing maturity assessment for innovative products based on new technologies. As the well-conducted marketing plays a crucial role in the ultimate success of the innovation project related to the development and implementation of advanced technologies, the development of marketing maturity assessment seems appropriate and up to date in analogy to the method of TRL and other expert and test approaches. An effective implementation of innovative processes is associated with combination of elements Science - Technology - Production - Consumption within one holistic reproductive structure, aimed at creation of an extensive system of supply and service maintenance to stimulate scientific researches and promote inventive activity on the basis of new communication type – feedback – in the innovation process. Due to constant and quick feedback from the market through the marketing departments, as well as to the increased response to changes of consumer demands, certain Japanese firms have won the automobile market: "Toyota", "Nissan", "Honda" spent about 24 months for the development of a new model, whereas "General Motors", "Ford" and "Chrysler" obtained result after 36 to 48 months (Beketov 2008, p. 14).

Successful application of this innovative marketing approach based on timely prediction of development of the created innovations throughout the entire lifecycle of the developed product is intended to ensure proper implementation and optimal combination of main components of the marketing complex (4P): product, price, place and promotion. Our understanding of solutions to this problem requires an existence of 6 marketing readiness levels (MRL). Benchmarks for particular readiness levels shall be as follows:

MRL 1 – *The concept of the projected product is studied, explained and improved.*

At the first marketing readiness level market research shall be organized and conducted, and then followed by a systematic processing of information on the state of market environment. The main task at this stage of marketing maturity is the adoption of a long-term strategic solution calibrated in terms of the projected product to be turned out. The concepts of a future product shall be studied, proposed and rationalized in order to choose the most optimal variant. In result of this level the proposed concept of innovative products and services shall be approved. Only after the product concept is approved, we can raise the issue of drawing up the plan of its further development and commercialization.

MRL 2 – *Pre-planning of main features of the product and production volume is completed.*
The second readiness level implies a deeper and more thorough study of key parameters, critical technology elements and features of innovation to meet the wishes and requirements of potential consumers and customers. In result of these measures future product architecture shall be obtained through its decomposition. A preliminary assessment of the volume of future sales and potential profit is carried out project-wide or program-wide. Also, at this marketing readiness level it is necessary to interact for the first time with customers in part of involving them as integral participants to the process of innovation. Cooperation between the Innovation Developer and customers shall be based on the win-win principle, when one or another benefit from such interaction is received by both participants.

We should note that modern innovative marketing is the process of bilateral cooperation. It must be really customer-oriented and feedback-seeking. Many well-known companies practice involvement of customers to the process of new product development, try to consider their opinions and preferences as much as possible. For example, Boeing Company takes into account the needs of a particular customer when developing a production aircraft. The main indicator for the level is complete shall be the approval of the project of launched innovative program by all participants.

MRL 3 – *The first phase of prototype testing is carried out by the customers.*
At the third readiness level a prototype design shall be completed and the sample produced. Design of the future product shall be carefully defined. The carried out technological processes shall also be verified and relationship with the selected design explored. First prototype (sample) shall be tested by the consumers who are ensured to participate in the analysis of test results. The consequence of this level shall be the final presentation, approval and selection of the optimal product design.

MRL 4 – *The second phase of prototype testing by the customers is finished and priority plan for sales market development is made.*
At the fourth innovation marketing maturity level, a thorough revision of certain "roughness" of some design details is carried out considering results obtained at the previous level and the problems identified. Then, a second phase of testing of the modified prototype is carried out; the sample is demonstrated to the consumers in order to verify the running processes on the level of system integration of separate technologies. The main purpose of this phase is an approval of projected products at system level. On the basis of the information received, after the second phase of demonstrated prototype testing and approval of the product at the system level by the potential customers, a marketing plan of the priority markets development, promotional activities and test sales organization can be made.

MRL 5 – *Test marketing is completed and readiness to enter the various sales markets is demonstrated.*
At the fifth readiness level, in fact, technology development and system integration shall be completed. Therefore, at this level it is advisable to organize the product test marketing in order to clarify if additional activities in order to reduce risk and costs are needed. It is necessary to obtain additional information about channels of distribution and of products marketing, special aspects of advertising and promotion, surrounding environment, etc. in advance of the release, and full-scale sales. It should be borne in mind that even at such a high readiness level the innovation can pass no national standards and be rejected by the public. Experience shows that it is possible in about half of cases (Goldstein 2004, p. 59). However, test marketing provides insight into the potential of the experimental line. Based on the evaluation and analysis of preliminary indicators a special committee to deal with small and minor problems associated with commercialization of the innovation shall be organized. Sales department shall be

formed and active re-training of personnel involved shall be carried out. After-sales services, customer service, support service and innovation technical support services shall be organized. This level is considered complete if first commercial sales are successful and first profit is gained.

MRL 6 – *Distribution and product sale in the open market is organized.*
At the final sixth innovation marketing readiness level a full-scale program on establishment of channels of distribution, promotion and product sale in different markets shall be organized. Successful cooperation and collaboration with key customers shall be set. This level is considered complete after agreement and approval of obtained commercial rates on the basis of stable positive sales dynamics.

There are reasons to believe that the sequential passage of MRL chain can help to reduce expenditures associated with commercialization of the advanced technologies, to increase the overall probability of success of the innovation project, to ensure proper support for the entire business-cycle of technological innovation production. This approach may be "brought to life" in the form of specially developed MRL calculator, executed in the Excel spreadsheet environment, by analogy with TRL calculator (Bilbro 2007, p. 35).

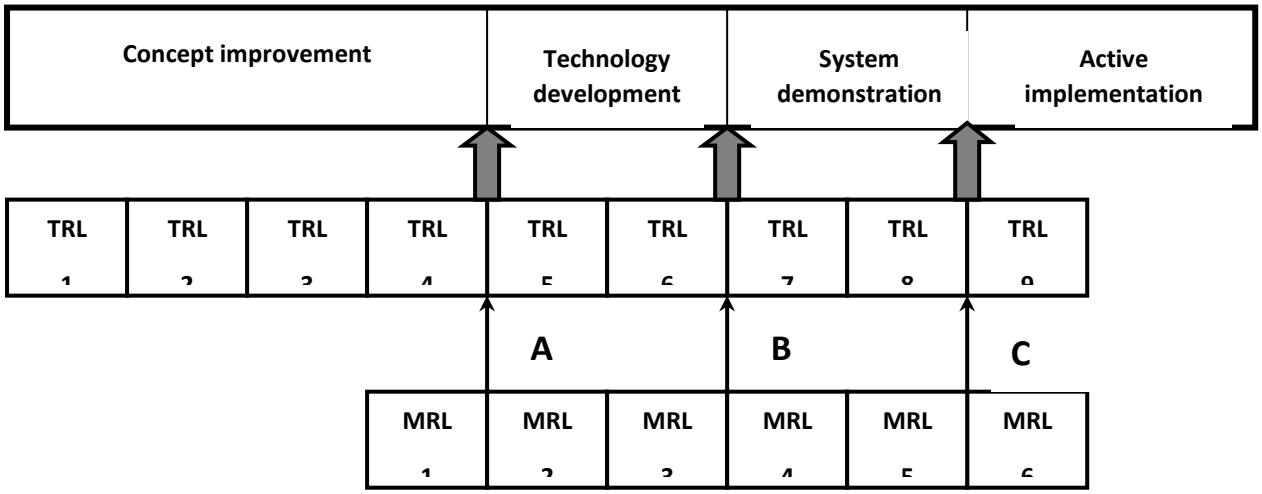

Figure 2. Main stages of marketing-management in innovative product development

On the basis of specially formulated questions and the required arguments on them in addition to other aspects related to the innovation production, the customer will be able to evaluate the current marketing readiness level of the advanced technologies. Innovative methods of marketing-management of advanced technologies are clearly shown in the *Figure 2* in the form of reference points on the scale of the innovation process from the position of its MRL. The first reference point **A** corresponds to the final adoption of responsible management decision regarding the approval of the proposed product concept. The second reference point **B** is associated with the final choice of product design and approval of processes performed. Passage of the third control point **C** relates to the decision on mass production, is connected with the completion of commercial preparation and presentation of innovation on the market.

We shall note that one of the most important marketing problems in the initial stages of innovation development is "project internal sale". This means that the responsible R&D performers must prove viability and technical feasibility of their ideas to the organization top management representatives, as well as to put forward the concept of innovation available for the understanding by a wider audience (Efimushkin, Ryzhenko, and Ovsyannikova 2013, p. 11).

The main difficulty in overcoming the first stage of innovation development is the lack of the product in its physical form. At this stage, the product exists only in the form of an idea or a concept. For this reason, it is impossible to explore the market potential by means of traditional marketing methods. The only thing that

company-developer can base on while overcoming the stage of perfection of the concept is the market reaction to the prediction of future innovation. Of course, the company may, through a market research study features of the market environment, structure, technology competition, ways to influence consumers. However, this information brings little benefit when only formation of an innovative product concept and development of technologies is performed as it reflects only information and response of consumers to the already existing products. Market reaction to the introduction of a radical innovation can be completely different and moreover it is often unpredictable. In this regard, the internal sale of the project can provide senior management with valuable information about the viability of the developed technologies that will be integrated into innovative product, to provide a certain percentage of clarity in the process of innovation creating and commercializing. Based on the results of internal sale of the project, decision makers may adjust the technology concept, for example, make it much more understandable and easy for a wide audience.

On the next stage, after the product technological concept is approved and responsible research executors proved to senior management the consistency of their ideas, a development of technologies that will be integrated into innovative product and make up it functional characteristics is performed. In the second stage of innovative product creating a marketing research will be of greater benefit to the company-developer, than in the first stage, but still not enough informative to assess the real chances for success. The main value of the information that can be obtained in the second stage of technological innovation creating is that the first version, the first alpha prototype of the product, fully stocked with new technologies is created and then can be tested by the potential consumers. In a result of such testing a company can get the first independent consumer feedback on its product, and it can give an idea of the preliminary impression on the product. Of course, it is good if the first reaction of consumers is mainly positive. However, it shall be remembered that this does not guarantee market success for an innovation. Therefore a company shall not relax and let things take their course after possible positive reaction. If the reaction to product after its first alpha prototype is tested will be mainly negative the developers shall pay maximum attention to the deficiencies identified, to revision of the selected design of the product. It is necessary to ensure that all participants of the innovative project accept the approved concept on the basis of positive reviews received from potential consumers who tested the first version of the product. Small separate demerits thus do not pose much of a problem, because they can be eliminated in the course of further technological improvement and considered during the product beta version development and testing.

Involving a customer in product development

The experience of many successful companies shows that the possibility of implementing of new technology is growing, if its development is carried out in parallel with the study of its market potential. Many experts and researchers believe that under current conditions the success of new products depends by 70 - 90% on the accuracy of its compliance with consumer preferences. Thus, Russian economist V. Goncharov, during the study of large-scale statistical material came to the conclusion that innovative technologies based on the preferences of consumers have the highest market success. To stay afloat, the company needs timely consider trends of demand and consumers' mood. For this reason, many companies are now using the program of scientific cooperation with their customers. Among them are world famous brands such as Dow Corning, Black & Decker Corp., General Electric and many others. The company integrates the consumers and works with them on a long term basis. A special attention in forecasting of demand shall be paid to the use of marketing information technology, which can help significantly increase the reliability and accuracy of the forecasts, and thus reduce the risks in the entire innovation project related to the innovation development (Klochkov and Gusmanov 2007, p. 10). Thus, the Internet communications in social networks, blogs, discussion forums, etc. are now an important tool of marketing (Kaluzhskiy and Karpov 2013, p. 33). It should be noted that this aspect of marketing is slightly studied and is still a vast field for research.

The rapid development of virtual environment, of information and communication technologies creates favorable conditions for the implementation of a more efficient system and process marketing management models. This is especially important for open innovations. A new approach to crowdsourcing process management in an innovation marketing that can be used in the model of open innovations is proposed in (Adamenko 2013, p. 44). However, in all methods and approaches forecasting of marketing criteria is an integral part of the entire business process of innovation production. This could include the following tasks: market research in order to identify

existing and latent demand, the problem of pricing on innovative products, forecasting of the potential sales volume taking into account specific needs, consideration of temporary factors of possible product launch on the market, evaluation and analysis of competition in the industry, forecasting of the impact of innovations to existing products, the study of possible distribution and sales channels, etc.

A variety of market-oriented technological innovations are inextricably connected with marketing activity innovations, the so-called marketing innovations. Since 2006 in the Russian Federation a separate register of marketing innovation in the field of statistics and innovations types record keeping is maintained. In accordance with the official definition of the Federal Service of State Statistics of the Russian Federation, marketing innovations are the implementation of new or significantly improved changes in the design and packaging of goods, works and services; the use of new sales techniques and presentation of goods, works and services, their presentation and promotion on the markets; the formation of new pricing strategies.

CONCLUSION

Changes occur rapidly in today's unpredictable economic system, and it requires flexibility, adaptability and creativity in the way of doing business from different companies. As to the marketing strategy, it is worth considering that the term "market" is shifting from simple consumers to the search for separate groups where consumers are united under some criterion. Companies which spend no funds for market research and use no forecast in planning of future activities are doomed to the loss of their old customers and almost certainly will not find new ones. Stressing the undeniable importance of marketing in activities of virtually any enterprise, let us recall the statement of known theorist of management P. Drucker: the main purpose of business is not the pursuit of profit, but in the establishment and maintenance of the customer base. Identification of value propositions, transition of them into real monetary income, support of promotion and creation of specialized distribution networks is a key universal strategic core of marketing activity.

We shall note that successful transfer of innovative technologies requires a special approach, rather than simple traditional marketing strategies applied to existing products, processes and capabilities. On top of that it is necessary to determine who is in need of innovation and why, how much are consumers willing to pay for innovation opportunities, and what is the best way to deliver the goods to the target customers, and where is the most advantageous place for sale. Advances in technology, globalization and the lack of strict regulation have a significant impact on both consumers and providers of goods and services. Forward-looking managers of efficient companies quickly adapt marketing activities in accordance with changes taking place in the market. The innovative expert and test system for marketing readiness levels assessment proposed by the author can help in answering on the questions above and to make a positive contribution to the ultimate success of development and introduction of advanced breakthrough technologies.

REFERENCES

1. Medvedeva, T. (2013). Management approach to understanding the essence of marketing: interpretation for enterprise managers, *Practical marketing*, (5), pp. 4-10.
2. Toffler, A. (1970). *Future Shock*, New York: Bantam Books, Inc.
3. Uturity-Vrubliauskiene, L., & Linkevicius, M. (2011). Innovative marketing decisions drive in business activities – a perspective direction of research, *Intellectual economics*, (3), pp. 445-459.
4. Brutyan M.M. (2013), Some aspects of the innovation activity strategic management, *Creative Economy*, (12), pp. 56-60.
5. James, W. (1907). *Pragmatism, A New Name for Some Old Ways of Thinking, Popular Lectures on Philosophy*, New York: Longmans, Green, and Company.
6. Dewey, J. (1929). *The Quest for Certainty: A Study of the Relation of Knowledge and Action*, New York: Minton, Balch, and Company.
7. Ashby, W. (1957). *An Introduction to Cybernetics*, London: Chapman & Hall.
8. Wiener, N. (1968). *Cybernetics or Control and Communication in the Animal and the Machine*, Moscow: Soviet Radio.
9. Fenn, J., & Raskino, M. (2008). *Mastering the Hype Cycle*, Boston: Harvard Business Press.

10. Alashkevich, Y., et al. (2015). *Factors of sustainable development of Russian regions*, Novosibirsk: TSRNS.
11. Goncharenko, L., & Arutyunov Y. (2009). *Innovation policy*, Moscow: KnoRus.
12. Sandberg, B. (2008). *Managing and Marketing Radical Innovations: Marketing new technology*, New York: Routledge.
13. Bovin A., Cherednikova L., & Yakivovich V. (2008). *Innovation management at organizations*, Moscow: Omega-L.
14. Akhmetova, I., et al. (2015). *Problems of economy and management of enterprises, branches, complexes*, Novosibirsk: TSRNS.
15. Morgan, J. (2006). Manufacturing Readiness Levels (MRLS) for Multi-Dimensional Assessment of Maturity, Working Paper, Air Force Research Laboratory, Wright Patterson AFB, OH, (accessed June 10, 2017), [available at: htttp://www.dtic.mil/get-tr-doc/pdf?AD=ADA507087].
16. Broadus, E. (2005). Process for Evaluating Logistics Readiness levels (LRL) for Acquisition Systems, Working Paper, Booz Allen Hamilton, Inc., Annapolis Junction, MD, (accessed June 10, 2017), [available at: http://www.dtic.mil/ndia/2005/systems/wednesday/broadus.pdf].
17. Blanchette S., Albert C., & Garcia-Miller S. (2010). Beyond Technology Readiness Level for Software, Technical Report, Carnegie Mellon University, (accessed June 10, 2017), [available at: https://resources.sei.cmu.edu/asset_files/TechnicalReport/2010_005_001_15305.pdf
18. Paun, F. (2011). Demand Readiness Level (DRL), a new tool to hybridize Market Pull and Technology Push approaches: Evolution of practices and actors of eco-innovation, Working Paper, ANR-ERANET, Paris, (accessed June 10, 2017), [available at: https://halshs.archives-ouvertes.fr/halshs-00565048/document].
19. Patterson, F. (2006), Prepare to Fund Your Technology Development, *Austin Business District Magazine*, (1), pp. 1-3.
20. Sauser, B., et al. (2008). A system maturity index for the systems engineering life cycle, *Industrial and Systems Engineering*, (6), pp. 673-691.
21. Mankins, J. (1995). Technology Readiness Levels, Working Paper, NASA, Washington, (accessed June 10, 2017), [available at: http://www.colorado.edu/ASEN/asen3036/TECHNOLOGYREADINESSLEVELS.pdf].
22. Nolte, W. & Kruse R. (2011), Readiness Level Proliferation, Working Paper, Air Force Research Laboratory, Wright Patterson AFB, OH, (accessed June 10, 2017), [available at: http://www.dtic.mil/ndia/2011/system/13132_NolteWednesday.pdf].
23. Beketov, N. (2008). Innovation activity and innovative process: essence and basic stages of research in the economic literature, *Economic analysis: theory and practice*, (3), pp. 11-16.
24. Goldstein G. (2004). *Strategic Innovation Management*, Taganrog: TRTU.
25. Bilbro, J. (2007). A Suite of Tools for Technology Assessment, paper presented at the AFRL Technology Maturity Conference, Virginia Beach, VA, (September 11-13).
26. Efimushkin S., Ryzhenko S., & Ovsyannikova A. (2013). Creative marketing in the creation of an innovative product, *Creative economy*, (10), pp. 3-14.
27. Klochkov, V., & Gusmanov, T. (2007). Marketing information technology in the aircraft industry, *Marketing in Russia and abroad*, (6), pp. 10-18.
28. Kaluzhskiy, M., & Karpov, V. (2013). Network internet communication as a marketing tool, *Practical marketing*. (2), pp. 32-39.
29. Adamenko, E. (2013). Marketing knowledge bases management in open innovation processes, *Creative economy*, (12), pp. 42-54.