Creating a model for commercialization of innovations in the software industry

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Abstract: Innovation in the software industry is the implementation of a new or improved software product that meets customer needs. When the software innovation is created, the commercialization process takes place. The commercialization makes the innovation a driver of economic growth. The research paper gives an answer to the question how software companies could develop more innovations that are successfully implemented on the market. The aim of the paper is to present a model for commercialization of innovations in the software industry that will help software companies in their efforts to create innovations that the market needs and desires to buy and use. The results of the research paper are based on literature reviews and a conducted survey among 33 software companies in Bulgaria that develop innovations. The period covered in the survey is from December 2015 to December 2017. The survey is conducted by the author of the paper. The introduced model for commercialization of innovations in the software industry eliminates the problems that software companies experience when developing product innovations. The model is applicable to any companies that develop and bring innovations to the market.

Key words: model, innovation, product innovation, commercialization of innovations, software industry.

I. INTRODUCTION

When thinking of creating a model for commercialization of innovations I started reading the scientific literature related to the terms of “innovation” and “commercialization”. I had to understand and define the nature of those terms. Then, I had to put all my findings into a test by conducting a survey, distributed among the software companies in Bulgaria that develop product innovations. Based on the results, I aimed to develop a model for innovation commercialization that companies could use to force their innovation activities.

Understanding innovations is a starting point that ensures the development of different instruments and models that could help and encourage the innovation’s success on the market. Regarding the term of “innovation” I went through different definitions and interpretations in the scientific literature. According to Mark Dodgson “Innovation is the successful commercial exploitation of new ideas. It includes the scientific, technological, organizational, financial and business activities leading to the commercial introduction of a new (or improved) product or service” [1, p.15]. Robert Mellor defines innovations as “Invention plus application” or “Creativity plus applications” [2, p. 26]. Albert Link defines innovation as “something new that has been brought into use” [3, p. 53].

A key element of the term of “innovation” is the implementation stage. All those definitions emphasis on the exploitation of the innovations. I can conclude that innovations are developed to satisfy needs. This is the reason why I can define the innovation as the implementation of a new or improved software product that meets customer needs. Customers and their needs are essential for the development of innovations. I know from my experience working in the software industry that customers play a central role in the innovation process.

When talking about commercialization there are different definitions of the term in the scientific literature. According to Everett Rogers “Commercialization is the conversion of an idea from research into a product or service for sale in the marketplace” [4, p. 152]. Diane Isabelle says that the “Innovation and commercialization are often used in overlapping ways to refer to the processes of discovering knowledge, developing it into technologies, and transforming these into new or adapted products, processes and services to be used or sold in the market place” [5, p. 10]. James Jordan says, “Commercialization is the process or cycle of introducing a new product or production method to the market. The end result of commercialization is the availability of the innovation to be exploited for profit” [6, p. 7]. According to Federico Frattini “Commercialization of innovation can be defined as the set of decisions and activities that are necessary to present a new product to its target market and start to generate income from its sale” [7, p. 2]. I can conclude that the term of “commercialization” contains two main elements: the introduction of the innovation to the market and the generation of sale. The generation of sale is the main purpose of the innovation. The introduction of the innovation to the market aims to create a desire but that desire for the innovation is established when the innovation is properly introduced to the market. Based on my thorough and detailed literature reviews on the term of “commercialization” I define the commercialization of innovations in the software industry as a process of the introduction of the innovation to the market that aims to create a market desire towards the innovation and the generation of sales for the software company.

I put into test my findings related to the innovation and the commercialization processes in the software industry. I aimed to outline the problems that the software companies had and then to create a solution to those problems by developing a model for commercialization of the innovations.

II. METHODOLOGY

The created model for commercialization of innovations in the software industry is part of a defended by the author of the paper dissertation thesis [8]. The information used in the empirical research is obtained by literature reviews, primary data from a conducted survey.
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[9], and secondary data from the Bulgarian association of software companies’ reports[10], European Union’s publications and innovation scoreboards [11], [12], [13].

A. Definition of the research problem

The European Member States realize that innovations drive productivity and create opportunities for new and better jobs. The European Union provides instruments that assess the innovation performances of the European countries and track the innovation progress. The reports of the European Commission reveal that this progress is too slow. The European Union recognizes the problem that exists regarding the development of innovations. Many of its global competitors show better innovation performances [11]. The European Union needs to take certain actions in order to promote innovations and create a favorable environment for the innovations to happen. Moreover, Bulgaria is in the group of the “modest innovators” [11] which also explains the necessity of developing a solution that could help the country in its strive to become part of the group of the moderate innovators. My literature findings define the research problem, which refers to the low level of innovation performance of the European countries, including Bulgaria.

B. Definition of the object and the subject of the study

The object of the study is the software companies (SMEs) in Bulgaria, members of the Bulgarian association of software companies that develop product innovations. Seventy-three (73) software companies present the object of the empirical research, which is the entire population. The subject of the study is the commercialization of the innovations developed by the software companies, members of the Bulgarian association of software companies.

C. Definition of the research thesis

The lack of in-depth research and thorough analysis of the commercialization of the innovations in the software industry in Bulgaria explain the main research thesis. There are no up-to-date knowledge and practical conclusions regarding the commercialization process of the innovations in the software industry in Bulgaria. Furthermore, without this basic knowledge, it is impossible to develop a strategy and relevant policies that focus on the development of innovations that have a potential for successful commercialization. The main research thesis identifies why it is important to create and present a model for commercialization of innovations in the software industry. This model aims to stimulate the software companies to develop innovative products and to help them commercialize those products successfully on the market.

D. Definition of the goal and the objectives

The goal of the empirical research is to develop and present a model for commercialization of innovations in the software industry. This model is an answer to the European Union’s efforts to create innovations that are successfully implemented into the market. The research goal is achieved by accomplishing the following four groups of objectives:

Group 1: Objectives related to the scientific literature research in the field of the innovations.

Group 2: Objectives related to the scientific literature research in the field of the commercialization process.

Group 3: Objectives related to the methodology of the empirical research.

Group 4: Objectives related to the research results.

E. Formulation of working hypotheses

The main hypothesis statement of the research study says: “The developed model for commercialization of innovations is applicable to innovative software companies in Bulgaria.” There are additional hypotheses that support the main hypothesis. The additional hypotheses are placed into two groups:

Group 1: Additional hypotheses related to the process of innovation development in the software industry.

Group 2: Additional hypotheses related to the process of commercialization of the developed innovations in the software industry.

F. Development of a conceptual model of the study

The author of the paper develops a conceptual model that aims to support the conduction of the empirical research. The conceptual model summarizes the key factors for the development and the commercialization of the innovations in the software industry and propose indicators to measure their impact on the software innovations. The conceptual model of the study presents the commercialization of the innovation as the ability of the software company to create innovations that have a potential for successful commercialization and the ability of the software company to build an effective communication channel that allows the application of certain marketing activities for the commercialization of the innovations.

G. Developing a research strategy

For obtaining the information needed, the author of the paper conducts both a survey and an interview. Two samples are generated. The survey sample consists of 33 companies. There are 25 close-ended, multiple-choice questions formulated for them. The interview sample consists of 6 respondents who answer 19 open-ended questions.

III. RESEARCH RESULTS

The results of [9] outline specific problems that software companies in Bulgaria experience when performing their innovation activities. The defined problems require solutions that aim to minimize the occurrence of the problems and to encourage the innovation development and the commercialization processes. In [9] it is shown that the software companies in Bulgaria face the following twelve problems related to the development and the commercialization of their innovative products:

Problem 1. Relatively low share of software companies that use the Market Pull approach for starting innovations. 39.4% of software companies in Bulgaria develop innovations that are identified as “Market-driven Innovations”, and 60.6% - innovations that are defined as “Technology-driven Innovation”.

Problem 2. Low share of software companies that focus
on Lead user needs as a source of innovations.

Regarding the innovation sources in the software industry, only 15.6% of software companies define the lead user as a source of innovation. Regarding the degree of agreement with the statement that “Lead user’s changing needs are a driver of innovations”, 18.2% of software companies “strongly agree” with this statement, and 54.5% - “agree”; 15.2% - neither agree nor disagree, and only 12.1% disagree with this statement.

Problem 3. Improper understanding and defining customer needs which lead to the development of innovations that do not satisfy those needs.

The highest is the share of software companies that define the “Improper understanding and defining customer needs” as a main reason for the unsuccessful implementation of the innovations in the software industry (30.2%).

Problem 4. Lack of knowledge about a model for a proper understanding customer needs.

72.2% of the software companies in Bulgaria consider the usage of an inappropriate model for understanding and defining customer needs critical for the development of innovations in software industry.

Problem 5. Low share of software companies that do promotional activities to introduce the innovation to the market and lack of knowledge about methods for the introduction of the innovation to the market.

Only 18.3% of software companies in Bulgaria do promotional activities to introduce their innovative products to the market. Moreover, 81.8% of software companies define the promotion as “extremely important” for the commercialization process.

Problem 6. Low share of software companies that do market segmentation.

Only 25.8% of software companies in Bulgaria segment the market to find customers for the innovation. 66.7% consider the usage of appropriate method for market segmentation essential for the commercialization process.

Problem 7. Lack of knowledge about customer preferences towards the innovation.

48.5% of software companies in Bulgaria consider the “lack of knowledge of market preferences” a major problem for the innovation commercialization.

Problem 8. Low share of software companies that do marketing researches for obtaining information about customer preferences.

Only 12.9% of the software companies in Bulgaria do marketing research for customer preferences towards the innovation.

Problem 9. Lack of knowledge about appropriate models for doing marketing researches.

Problem 10. Low share of software companies that develop a unique selling proposition (USP).

Only 14.0% of software companies in Bulgaria develop a USP for their innovative products. Only 3.0% of software companies define the USP as “unimportant” for the commercialization of the innovations.

Problem 11. Difficulties in the sales process.

25.8% of the software companies have difficulties when selling their innovations. The role of the selling techniques in the software industry is important. 51.5% of software companies define the “Selection of the right technique for closing the deal” as “extremely important” for the commercialization of the innovation. Another 27.3% define this factor as “important”, and 21.2% of software companies define this factor as “unimportant”.

Problem 12. Lack of a complete model for commercialization of the innovations in the software industry.

48.5% of software companies consider the “lack of a complete model for commercialization of the innovations” as a major problem for the development and the implementation of unsuccessful innovations.

A. Model for Commercialization of Innovations in the software industry

The identified problems confirm the importance of developing a model for commercialization of innovations in the software industry. The presented model eliminates the defined problems and stimulates the innovation development in the software industry.

The model for commercialization of the innovations contains two phases (Fig. 1).

Fig. I. Model for commercialization of innovations in the software industry[8]

Phase 1: The first phase consists of three steps that represent the essentials in the process of the innovation development in the software industry.

In the first step, the software company chooses a source of innovation. Both the scientific literature and [9] indicate the importance of the lead user for starting innovation in the software industry. In the second step, the software company focuses on the lead user changing needs. Every change is a good opportunity to start something new and different. The lead user has needs that are identified, as future market needs[14]. Software companies should use lead customer’s knowledge in the innovation process. The development of successful innovations is a process of understanding...
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customer needs and preferences and giving them a central role. In the third step, the software company focuses on the importance of properly understanding and defining the needs of the lead customers in order to start developing successful innovations.

Each of the three steps of the “Innovation Development” phase uses certain tools for their accomplishment.

**Phase 2:** The second phase consists of five steps that represent the essentials in the commercialization process. In the first step, the software company directs its efforts towards finding a way to successfully introduce the innovative product to the market. Customer interest and desire to buy and use the innovation depend on the way the innovation is presented to the market. This step is very important because the process of positioning the innovation in customer’s mind starts here. In the second step, the software company has to find customers who are ready to buy and use the innovative product. This step is difficult and requires that the software company search for effective methods for doing market segmentation. In the third step, the software company has to understand customer preferences towards the innovation. There is a significant difference between the terms of “need” and “preferences”. In this step, the customers have to evaluate the innovation by defining the important for them attributes of the innovative product. In the fourth step, the software company develops a “unique selling proposition” (USP) that aims to position the software innovation in customers’ minds as a product that satisfies their needs and preferences. This innovative product needs to have a uniqueness that distinguishes it from other competitive products. In the fifth step, the software company sells the innovation. The sales process is the final step of the commercialization process. The successful accomplishment of this stage makes the innovation valuable for the company too. Each of the five steps of the “Innovation commercialization” phase uses certain tools for their accomplishment.

The define steps and the tools for commercialization of the innovations in the software industry give a solution to the defined problems that the software companies face (Table I).

**Table I. Model for commercialization of innovations – a solution to the defined problems[8]**

<table>
<thead>
<tr>
<th>Problem</th>
<th>Step</th>
<th>Tool</th>
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<tr>
<td>1. Low share of software companies that focus on Lead-user needs as a source of innovations</td>
<td>Lead user as a source of innovation</td>
<td>Lead user Profile</td>
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<tr>
<td>2. Improper understanding and defining customer needs which leads to the development of innovations that do not satisfy those needs</td>
<td>Focus on Lead User changing needs</td>
<td>Definition of “need” for developing innovative products</td>
</tr>
<tr>
<td>3. Lack of knowledge about a model for a proper understanding of customer needs</td>
<td>Model for properly understanding Lead user needs</td>
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<td>4. Low share of software companies that do promotional activities to introduce the innovation to the market</td>
<td>Marker Introduction of the innovation</td>
<td>Development of Innovation Bulletin</td>
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<td>5. Lack of knowledge of about method for market introduction of the innovation.</td>
<td>Finding customers for the innovation</td>
<td>Nested Approach for Market Segmentation</td>
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<tr>
<td>6. Low share of software companies that do market segmentation</td>
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<td>7. Lack of knowledge about customer preferences towards the innovation.</td>
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<td>8. Low share of software companies that do marketing researches for getting information about customer preferences.</td>
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<td>8. Lack of knowledge about appropriate models for doing marketing researches</td>
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<td>10. Low share of software companies that develop a Unique Selling Proposition</td>
<td>Develop a Unique selling proposition</td>
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<td>11. Difficulties of the software companies in the sales process</td>
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<td>12. Lack of a complete model for commercialization of the innovations.</td>
<td>Development of a complete model for Commercialization of the innovation in the software industry</td>
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**B. Tools for Commercialization of innovations in the software industry**

The model for commercialization of the innovations in the software industry proposes the following tools that help the software companies perform and accomplish each of the steps.

1. **Lead user profile**

In order to increase the share of software companies that use the Lead user to start innovations, the author of the paper develops a Lead user profile (Table II) which is based on three indicator (Fig. II) for its identification, proposed by Cas de Koning [15].
3. Model for understanding customer needs

The author of the paper suggests that software companies research and use models for understanding customer needs in which the company’s focus on the customer and the product is transformed into a focus on the job the customer wants to perform and accomplish. The results of [9] confirm the application of the Job-to-be-done Concept in the software industry. Creator of the “Job to be done” concept is the American lecturer and author Clayton Christensen. He says, “Most companies segment their markets by customer demographics or product characteristics and differentiate their offerings by adding features and functions. But the consumer has a different view of the marketplace. He simply has a job to be done and is seeking to “hire” the best product or service to do it” [16, p. 8]. The author of the paper strongly believes that such models will contribute to the development of successful innovations in the software industry.

4. Innovation Bulletin

When introducing the innovation to the market, the software company aims to inform the market about the innovation existence and to generate interest. Customer should easily understand the content of the innovation. The author of the paper suggests that software companies develop an innovation bulletin, which aims to:

- Inform the market about the existence of innovation.
- Inform the market about the functionalities that the innovation offers.
- Generate interest in the innovation.
- Induce customers to take action to buy the innovation.

The results of [9] determine the key role of the innovation introduction to market for the commercialization process. The software companies should direct their efforts towards finding ways to effectively let the market know about the innovative product.

5. Nested Approach for market segmentation

The results of [9] show that high share of the software companies determine the market segmentation as a key factor for the commercialization of the innovations in the software industry. However, low share of the software companies do market segmentation. In order to increase the share of the software companies that segment the market when trying to find customers for their innovation, the author of the paper presents the Nested approach for market segmentation. Benson Shapiro and Thomas Bonoma first propose the Nested approach as a method used for segmentation of business markets [17]. The Nested approach is applicable to the software industry. This statement is supported by the results of [9]. This approach identifies five general segmentation criteria that are arranged as a nested hierarchy. Moving from the outer nest toward the inner, these criteria are demographics, operating variables, customer's purchasing approaches, situational factors and personal characteristics of the customer.

In Fig. III, the author presents the Nested approach for market segmentation with sample criteria that can be used by software companies. The example given by the author aims to facilitate the understanding of the proposed approach.

2. Definition of “need”

Proper understanding and defining customer needs is a key to innovation development in the software industry. The results of [9] also confirm this statement. In order to increase the share of the software companies that develop successful innovations, it is important to define the term of “customer need”. It is important for software companies to focus on the question of why, not the question of what to develop. This means focusing on the question why the customers want to use the innovative product, what job they want to accomplish. For developing successful innovations, companies should understand customer needs as jobs that have to be done. The job that customers try to accomplish outlines and gives a definition of “customer need”. Software companies have to look for and observe those jobs when thinking of starting innovations.
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segmentation approach. The example is based on the author’s professional experience.

![Fig. III. Nested Approach for market segmentation in the software industry][8]

6. Conjoint Analysis for marketing research

The knowledge of the software companies about the customer preferences towards the innovation helps them position the innovative product, develop a powerful USP and formulate a value proposition. In order to increase the share of software companies that obtain information of the market preferences towards the innovation, the author of the paper suggests that software companies use the Conjoint Analysis for conducting a marketing research. Conjoint Analysis is “any decompositional method that estimates the structure of consumer’s preferences… given his or her overall evaluations of a set of alternatives that are pre-specified in terms of levels of different attributes”[18, p.104]. By using the Conjoint Analysis, the software companies obtain information about customer preferences towards the innovation. Having the information at hand software companies are ready to and offer innovation that customers want to use and buy.

7. Unique Selling Proposition

The results of [9] highlight the importance of the USP for the commercialization of the innovation in the software industry. However, low share of the software companies develop USP. In order to increase their share, the author of the paper develops and present a model for developing a powerful USP (Fig. IV). The developed USP aims to distinguish the innovation from the competition and to generate market interest and desire to buy the innovative product. The author suggests a certain approach of innovation uniqueness, which is related to the “Offering the most appropriate innovative product to the particular customer”. The proposed way of innovation uniqueness is based on the understanding that the software product is not a physical product. Software innovation can be modified in accordance with specific customer needs and preferences. In order to create such a USP the software company must have knowledge of the innovative product and knowledge of customer needs and preferences. This approach makes the innovation unique, because it satisfies specific customer needs and preferences. This approach also has an impact on customer’s decision to buy and use the innovation.

![Fig. IV. Model for developing a unique selling proposition in the software industry][8]

8. Sales Techniques for innovations

The results of [9] show that the software companies have difficulties in the process of selling the innovations. The customer’s final decision to buy and use the innovative product is a result of a trust and long-lasting relationships established between the software company and the customer. A salesperson takes the role to do the sales process. The salesperson has the power to influence the customer’s buying decision, but he or she should know how to put the customer in the center of the sales process. According to Anthony Solimini, “every person who do a sales process must have the following three characteristics: 1. Knowledge of the product. 2. Knowledge of the market. 3. Ability to place the customer at the center of the sales process” [19, p. 9].

There are different sales techniques in the scientific literature that the software company can use. It is common between writers that the closing techniques are strongly related to success. Software companies should use many types of closes and they should close frequently during the call.

IV. CONCLUSION

The author of the paper strongly believes that the software companies will improve their innovation performances by using the proposed model for commercialization of their innovations. Following the steps described in the model, software companies could enrich their knowledge about the innovation development and the commercialization processes. As a result, software companies will eliminate the difficulties that they have and learn to develop innovations that bring economic and social growth.

The model is applicable for developing product innovations. The author believes that companies from other industries could also adopt the model for commercialization of the innovations.

REFERENCES
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Dr. Katerina Kozludzhova is working as a Chief Assistant Professor in Plovdiv University Paisii Hilendarski, Bulgaria. She teaches Business Innovations. Previously, Katerina had an experience as a product manager in one of the leading Software companies in Bulgaria. In her professional career, she has taken part in national and international business conferences and projects. She is a developer of software innovations successfully implemented in the market. Katerina obtained PhD degree in May 2018. Her current interests include Software innovations, Customer-driven Innovations, Outcome-driven Innovations, Business models for innovations.