

Key success factors of innovations in the software industry

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Abstract: Innovation is a driver of a long-term economic growth and structural change for economic progress. Innovation must increase value for both the company and the consumer. For consumers, innovation means higher quality and better value goods, more efficient services, and a higher standard of living. For the innovative company, innovation is a competitive advantage, adaptation, a meaning of existence and growth. The software industry has a leading role in that process because it possesses the technology and the knowledge, which are key elements in every innovation process. The software is becoming a widespread phenomenon in modern economies, which plays a significant role in the growing number of new products and processes. Creating innovations is considered to be the only skill that software companies should possess in order to stay competitive on the market and provide benefits to society. The productivity of the manufacturing processes in different sectors of the economy depends on the extent to which software innovations are developed. The research paper focuses on the innovations created by software companies and aims to underline the key success factors that determine the development of successful innovations. These key factors ensure that both the innovative companies and the customers receive value from the innovations. The presented key factors are based on literature reviews and a broader survey on the commercialization of innovations in the software industry in Bulgaria. The empirical research is conducted in December 2017, among 33 software companies, which have innovation activities in the period under review. The surveyed period ranges from 2015 to 2017. The defined key success factors of innovations could be used by software companies worldwide in their efforts and desire to create innovations of a value.

Keywords: innovation, key factors, product innovation, software industry.

I. INTRODUCTION

Product innovation in the software industry is the implementation of a new or improved software product that meets the needs of the customer. Focusing on this definition of the term of "product innovation", I started reviewing the scientific literature on the importance of creating innovative products that meet customer needs. Because if they do not meet those needs, these products are not considered innovations. Having an experience as a product manager in a software company, I know that product innovations are highly dependent on the customer's assessment of their usefulness.

Manuscript published on 30 March 2019.

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The usefulness of innovative products determines the customer's willingness to use and purchase those products, which is the economic purpose of existence for every company. I continued searching different approaches for starting developing product innovations. I found out that Market Approach was considered to be more successful regarding the commercialization of the developed innovations in the software industry. Then, I said to myself "Well, how could I be sure that the customer needs were properly understood". I continued my literature review by reading about different models for understanding customer needs. There were traditional and new, innovative models for properly understanding customer needs. But whose needs should the software company focus on? I put into test my literature findings by conducting a survey [1] among 33 software companies in Bulgaria, which represented the generated sample. Based on my literature researches I defined the key success factors that software companies should know and follow when thinking of starting product innovations. I strongly believe that the presented key factors of innovations in the software industry would be of a value for software companies when taking the decision to start developing product innovations. I also believe that these factors could be surveyed and adopted in other industries too.

II. METHODOLOGY

The research of the key success factors of product innovations in the software industry is part of a larger research of the Innovation Commercialization in the software companies in Bulgaria. The methodological part of the complete empirical research includes seven elements:

- Definition of the research problem and formulation of its topic.
- Definition of the goals and the objectives of the study.
- Identification of the object and the subject of the study.
- Formulation of working hypotheses.
- Justification of the object and the subject of the study.
- Presentation of the software industry in Bulgaria.
- Development of a conceptual model of the study.

A. Research Problem

The European Union understands that the creation of innovation is a major source of economic growth. The European Commission and the European Member States focus their attention and efforts on innovations as a central element in their policies to create more employment and higher economic results. The European Union recognizes the problem that exists regarding the development of innovations and takes certain actions in order to create a favorable environment for the development and the commercialization of the innovations.



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Bulgaria is in the group of the “modest innovators” but the country strives to be part of the moderate innovators’ group. My research on the key success factor for the development of product innovations is my respond to the European Union’s efforts to stimulate and help the creation of innovations that could boost the economic development. My research aims to eliminate the difficulties that software companies experience and encourage the development of successful innovations.

B. Goal and Objectives of the study

The goal of the empirical research is to develop and present a model for Innovation Commercialization in the software industry. Pursuing this goal, one of the main objectives is to define the key success factors for innovations in the software industry, which is the purpose of the current paper.

C. Object of the study

The object of the study is the software companies (SMEs) in Bulgaria, members of BASSCOM. BASSCOM is an association of leading Bulgarian software development companies, established in 2001. The association includes more than 80 software companies (full members) and over 120 associated members, including higher education institutions, foundations, venture capital funds and more. I chose to study the SMEs because they play a central role in the European economy. They are a major source of entrepreneurial skills and innovations.

Seventy-three (73) software companies present the object of the empirical research, which is the entire population. For selecting the companies to participate in the survey, the stochastic selection method is used, where all units in the entire population have an equal chance of being selected. The advantage of this method is that the structure of the sample reproduces with certain precision the structure of the entire population. The generated sample consists of 33 software companies.

D. Data Sources

The information used in the empirical research is obtained by:

- Literature reviews.
- Primary data from a conducted survey.
- Secondary data from BASCOM reports and European Union’s publications and innovation scoreboards.

E. Research Strategy

The research strategy involves the application of both the quantitative and the qualitative method. The quantitative method is presented by the conducted questionnaire survey among the software companies – the object of the research. The qualitative method is presented by the conducted interviews with product managers of the software companies. The interviews aims to seek answers to more complex questions that cannot be included in the survey questionnaire.

F. Data Analysis

Data is processed and analyzed by a software program for Statistical analysis in social sciences (SPSS), a software program for Qualitative Data Analysis (NVivo) and Microsoft Excel.

III. KEY FACTORS OF INNOVATIONS IN THE SOFTWARE INDUSTRY

The key factors that I can define, based on both my literature reviews and the conducted survey [1], fall into the following two groups:

Group 1. Key factors related to the process of innovation development in the software industry.

Group 2. Key factors related to the process of the commercialization of the developed innovation in the software industry.

A. Key success factors of innovations in the software industry – Group 1

1. Focus on Lead users’ needs for starting innovations

The success of any company depends on its ability to create innovative products that meet the needs of the customers. The software companies that take part in [1] also confirm the above statement. Despite their size, all of them agree on the leading role of the customer. Focusing on customer needs is essential. The main question here is “Whose needs should the software companies try to identify?”. Customers are main source of innovations in the software industry. A change in their needs is an opportunity for the company to start developing an innovation. However, not every customer could be a source of innovation. This role is performed by the so-called “lead user”. Reading the scientific literature in this field, I can say that innovations developed by lead users tend to be more commercially attractive. Professor Eric von Hippel [2] develops the term of the “lead user” in 1986. It defines a particular group of customers that have the following five characteristics:

- Lead users are ahead of the majority of users in their populations with respect to an important market trend.
- Lead Users have a good awareness of the problem, which other users observe much later. Lead users are currently experiencing needs that will be experienced by many users in the marketplace in the future.
- Lead users anticipate relatively high benefits from obtaining a solution to their needs, and so may innovate. Lead users have self-interest in solving a problem. Therefore, they are especially motivated to become active and to work together with the company on the development of new solutions.
- Lead users know the weaknesses of existing products and have good ideas on what functionalities can be added to these products in order to make them more valuable.
- Lead users tend to know about useful advanced analogs, because they have been struggling with their problems for a long time, and often have searched beyond the target market for information. Lead users are people with rare interests or attributes who tend to know others like themselves.

Having an experience in the software industry, I can say that software companies have lead customers who know the market and who are ready to share their knowledge in order to receive solutions that satisfy their needs. Software companies should create future oriented innovations. I put into test my literature findings related to the “Focus on the Lead users’ needs” as a key success factor of innovations in the software industry. I asked the software companies in Bulgaria about the sources they used for starting their innovations. As in [1]20.5% of the software companies (Table I) define the “new technologies” as a source of opportunity for innovations. In terms of the customer and his/her needs, 15.6% of software companies define the lead customer as a source of innovation and 13.1% - the non-lead (regular) customer. I can say that the software innovation started by a technological opportunity should also be focused on lead users’ needs and requirements.

Table I. Sources of innovations in the software industry

| Question: Please indicate the innovation sources in your company. | | |
|---|---------------------|------------|
| Innovation Sources | Number of companies | Percentage |
| Lead user | 19 | 15.6 |
| Regular user | 18 | 13.1 |
| Competition | 14 | 11.5 |
| Supplier | 2 | 1.6 |
| Employees | 20 | 16.4 |
| New technology | 25 | 20.5 |
| Partners | 9 | 7.4 |
| Management team | 12 | 9.8 |
| Educational and R&D organizations | 5 | 4.1 |
| Total | 33 | 100.0 |

To the question “To what extent do you agree with the statement that “Change in lead customer’s needs is a driver for innovations in the software industry?”, 18.2% of the software companies in Bulgaria say that they “strongly agree” with this statement, 54.5% - “agree” with the statement (Table II) [1].

Table II. Lead customer as a driver for innovations

| Question: To what extent do you agree with the statement "Change in lead customer’s needs is a driver for innovations" in the software industry? | | |
|--|---------------------|------------|
| Scale of agreement | Number of companies | Percentage |
| Strongly agree | 6 | 18.2 |
| Agree | 18 | 54.5 |
| Neither agree nor disagree | 5 | 15.2 |
| Disagree | 4 | 12.1 |
| Strongly disagree | 0 | 0 |

| | | |
|-------|----|-------|
| Total | 33 | 100.0 |
|-------|----|-------|

To the next question “What is the relative share of your new and/or improved software products that are developed by a change of lead user’s needs?”, the software companies answer as follows (Table III): 36.4% of them indicate that between 11% and 30% of their new/improved software products are developed by a change of a lead user’s need. The lowest is the percentage of software companies (15.2%) that have more than 50% of their new/improved products developed by a lead user’s need, which roughly coincides with the share of companies that strongly agree with the statement that the lead customer’s need is an engine for innovation [1].

Table III. Share of software companies that develop lead customer’s need-driven innovation

| Question: What is the relative share of your new and/or improved software products that are developed by a change in lead customer’s needs? | | |
|---|---------------------|------------|
| Relative share | Number of companies | Percentage |
| Up to 10% | 8 | 24.2 |
| Between 11 and 30 % | 12 | 36.4 |
| Between 31 and 50 % | 8 | 24.2 |
| Above 50% | 5 | 15.2 |
| Total | 33 | 100.0 |

Concerning the innovation commercialization process, 100% of the software companies in Bulgaria believe that there is a relationship between the commercialization and the participation of a lead customer (Table IV) [1].

Table IV. Innovation commercialization – Lead Customer Relationship

| Question: How important is the involvement of a lead customer in the innovation process for purposes of the commercialization? | | |
|--|---------------------|------------|
| Importance Scale | Number of companies | Percentage |
| Extremely important | 17 | 51.5 |
| Important | 16 | 48.5 |
| Not Important | 0 | 0 |
| Total | 33 | 100.0 |

The presented results in [1] underline the role of the lead user in the innovation process. I am sure that by focusing on lead users’ changing needs software companies will improve their innovation performances and results.

2. Definition of “customer need”

My literature research continued with studying different methods for understanding customer needs.



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There were traditional and new, innovative methods for defining and understanding those needs. I studied the Clayton Christensen's "Job to be done" Concept [3]. According to [3] product innovations help customers complete a certain task, a certain job. Unlike physical products, software products could provide a choice between many and different functionalities. Software developers need to know what functionalities to develop in order to create a valuable product. It is important for them to know how customers estimate the performance and the value of the software innovations. They use metrics. Then I started reading about Anthony Ulwick's findings [4] regarding customer needs and the metrics they use to evaluate the innovation. According to [4] customer needs are defined by the desired outcomes that they want to achieve using the innovative product (Outcome-driven Innovations). Desired outcomes represent the customer need. I put this concept into test in the software companies.

I conducted an interview, where I could observe the attitude and the opinion that the managers of the software companies shared. The results supported my literature findings. All the interviewed emphasize on the importance of understanding customer needs. Many of them said that they often experienced difficulties trying to understand their customer needs. This misunderstanding led them to product failure and customer lost. The problem was that marketers understand differently customer needs. The information they provide to the developers is useless. By using the Outcome-Driven Innovation Concept, software companies could eliminate the obstacles and the constraints that they experience when understanding customer needs. This is the exact information that the software developers need in order to create innovations of a value.

3. Properly understanding of customer needs

Finding an appropriate model for properly understanding customer needs is essential. I used the interview to put this key factor into test [1]. I thought that I could not be able to receive broad enough data from the survey. That question required observation and face-to-face conversation. I found out that according to the software companies, the process of identifying the customer needs involved researching their everyday business processes, talking to them, asking them specific questions. These are the methods that software companies use. Moreover, this is not a one-time act, it is a process that ends when customer needs are fully and properly defined. There is a process of interaction between the company and the customer and that process continues until the establishment of a joint definition of the needs and the proposed solutions. All of the software companies say that the process takes an enormous amount of time. I strongly believe that the process should be facilitated. I put into test Anthony Ulwick's model [5] for understanding customer needs. As in [5] the model presents three phases of understanding customer needs. These are three types of information – information about the job the customer wants to accomplish, information about the desired outcomes that the customer wants to achieve and the constraints that he or she wants to overcome or eliminate. All interviewees give one answer: "Yes, it sounds very structured. The model represents the need that we should try to define" and "Yes, as I said, it is very important for us to understand the needs of the customer correctly. We take a lot of time and resources to do that".

Medium-sized companies insist on differentiating the terms "need", "want" and "problem" without explaining why this is important for them. It is extremely important to search for new, innovative tools that will ease the process of understanding customer needs. Trust in software business is critical. The interaction with customers creates and retains the trust. Anthony Ulwick's model for understanding customer needs provide an interaction with customers, trying to solve the real problems they have.

The definition of the "Properly understanding of customer needs" as a key success factor of product innovations is also validated by the conducted survey among software companies in Bulgaria [1]. 30.2% from the software companies define the "Incorrect understanding of customer needs" as a main reason for their innovation's failure (Table V). 72.2% of the surveyed software companies believe that using the right model for properly understanding and defining customer needs is critical for creating of innovations in the software industry (Table VI).

Table V. Reasons for innovation implementation failures

| Question: What do you think are the reasons for the innovation implementation failures? | | |
|---|---------------------|------------|
| Reasons | Number of companies | Percentage |
| Failure to understand customer needs | 19 | 30.2 |
| Lack of financial resources | 12 | 19.0 |
| Unrealistic development and implementation deadlines | 6 | 9.5 |
| Poor organization of the processes of innovation development and implementation | 15 | 23.8 |
| Insufficient staffing | 11 | 17.5 |
| Total | 63 | 100.0 |

Table VI. Method for properly understanding and defining customer needs

| Question: How important is the application of an appropriate method for understanding customer needs for the development of innovations in the software industry? | | |
|---|---------------------|------------|
| Importance Scale | Number of companies | Percentage |
| Extremely important | 24 | 72.7 |
| Important | 9 | 27.3 |
| Not important | 0 | 0 |
| Total | 33 | 100.0 |

B. Key success factors of innovations in the software industry – Group 2

1. Innovation Introduction to market

When introducing the innovation to the market, we try to inform the customers about the developed innovation and create a positive attitude and interest towards the innovation.



This is the goal that we have. In the context of the software industry, I know that the innovation introduction to the market plays a central role for creating an interest towards the innovation and generating a market desire to buy and use the innovation. The way the software innovation is presented to the market and customers hear about its existence define its market success. Software companies need to be sure that customers perceive the innovation as a product that has all the functionalities that satisfy their needs. The innovation introduction to the market requires the implementation of certain promotional activities of the software companies, whose message should:

- Informs the market about the existence of innovation.
- Informs the market about the functionalities that innovation offers.
- Generate interest towards the innovation.
- Encourage customers to take actions to buy the innovation.

This message should be spreadaway in a structural way so that it could be easily understood.

The results of [1] confirm the importance of the “Innovation introduction to market” and its definition as a key factor of innovations in the software industry. 81.8% of software companies define it as “extremely important”(Table VII). These results require the search of appropriate models and methods for successfully introducing the innovation to the market.

Table VII. Importance of the initial introduction of the innovation to the market

| Question: How important is the initial introduction of the innovation to the market? | | |
|--|---------------------|------------|
| Scale of importance | Number of companies | Percentage |
| Extremely important | 27 | 81.8 |
| Important | 6 | 18.2 |
| Not important | 0 | 0 |
| Total | 33 | 100.0 |

2. Selecting the right method for market segmentation

In the context of the software industry, I know that the process of market segmentation is important because:

- The software product, unlike the standard product, is flexible. It can be modified according to customer preferences. Software innovation allows different combinations of innovation functionalities directed towards different customer needs. Software innovations can satisfy the needs of different market segments, which determines the necessity to distinguish and define different market segments.
- Depending on the combination of functionalities, the innovation could have different price. This means that innovation could target customers with different price sensitivity, which also determines the necessity to segment the market.
- The software product is dependent on the scale in which it is deployed and the number of its users. This also determines the need to segment the market and define different customer groups. For example, for large customers where there is an expertise available to

support the infrastructure on which the software works, it is more appropriate to offer “On-premise” solutions. For smaller customers who have no capacity to maintain infrastructure and a small number of software users, it is more appropriate to offer “Cloud” solutions.

- The way in which updates, upgrades, patches, new versions of the software are received varies depending on the different customer groups. For example, for small customers, the above-mentioned activities are planned and implemented at a time determined by the software company. All small customers receive the product updates at the same time. For large customers, these activities are usually carried out at a time determined by the customer, at customer’s request. This also determines the need for a market segmentation process.
- The software product may be offered with the additional option for upgrading, updating the version depending on the scope of the customer’s activities.
- In the software industry, there are different types of maintenance depending on the type of the customer. Unlike other sectors, the online support is widely spread. However, in many cases, large customers or customers with specific characteristics prefer to have an attendance support.
- Depending on the type of the customer and the number of users of the software product, the implementation of the software product could also be done on-site or online. The same refers to the product training sessions.
- In the context of the software industry, the market segmentation allows the innovative company to offer innovation that is both desired by the customer and economically beneficial to the company.

According to the results of the [1], one of the most important activities that the software companies perform is the market segmentation. Software companies use different approaches when segmenting the market as the “segmentation by functionalities” is the most common.

As in [1] medium-sized companies do market segmentation by using the “vertical segmentation” method. Small software companies find customers with the help of their partners, they say, “We find our customers through our partners”. Finding the right people who are ready to take the risk of buying and using an unfamiliar innovation is a key factor for the innovation success. Therefore, the usage of appropriate method for market segmentation is significant.

3. Definition of “customer preferences”

In the context of the software industry, the definition of the customer preference is essential. Software companies make a difference between the two terms – customer needs and customer preferences. Customer preference refers to a set of different attributes of the innovation that the customer perceives as important and satisfying his or her needs. Software innovation provides combination of different attributes. A software innovation’s attribute could be its functionality, price, types of maintenance, etc. Different customers value different innovation attributes. It is important for the software companies to know the preferences of their customer when creating innovations.



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Customers should be involved in the innovation process where they have the opportunity to define the important for them attributes.

The definition of the customer preferences is a key success factor for innovations in the software industry. The conducted interview with managers of the software companies confirm that. They say that customers estimate the value of the software innovation evaluating the values of its attributes. In [1], 72.7% of the software companies in Bulgaria define this factor as “important” (Table VIII). Software companies’ efforts should be directed towards finding ways to receive information about customer preferences.

Table VIII. Importance of defining customer preferences towards the innovation

| Question: Please define the importance of the customer preferences for the innovation success. | | |
|--|----------------------------|-------------------|
| | <i>Number of companies</i> | <i>Percentage</i> |
| Extremely important | 9 | 27.3 |
| Important | 15 | 45.4 |
| Not important | 9 | 27.3 |
| Total | 33 | 100.0 |

4. Development of “Unique Selling Proposition”

A unique selling proposition is a description of the qualities that are unique to a particular product and that differentiate it in a way, which will make customers purchase it rather than its rivals. Rosser Reeves [6] firstly introduce the concept of “Unique selling proposition” in 1961 in his book “Reality in Advertising”. He defines this concept in three parts:

1. Each advertisement must make a proposition to the consumer - not just words, product puffery, or show-window advertising. Each advertisement must say to each reader: “Buy this product, for this specific benefit.”
2. The proposition must be one the competition cannot or does not offer. It must be unique--either in the brand or a claim the rest of that particular advertising area does not make.
3. The proposition must be strong enough to move the masses, i.e., attract new customers as well as potential customers.

The main element of the “unique selling proposition” concept is its uniqueness. According to Tim Hindle the uniqueness can be sought in a number of ways [7]:

1. By offering the lowest price.
2. By offering the highest quality.
3. By offering the best customer service.
4. By being exclusive.
5. By offering the widest choice.
6. By giving the best guarantee.

In the context of the software innovations, I can add another way of uniqueness, which is related to the “By offering the right innovation that meets the needs and preferences of the particular customer”. Software product is not a physical product. As discussed earlier the software product is a combination of different attributes. Software companies should focus on the offering of the right attributes to the right customers. That makes the software innovations

unique and desirable. In [1], the software companies define the “Development of Unique selling proposition” as a key factor for successful innovations in the software industry (Table IX). 45.5% of the software companies define this factor as “extremely important”, 51.5% - as “important”.

Table IX. Importance of developing Unique Selling Proposition

| Question: How important is the development of “Unique selling proposition” for innovation success? | | |
|--|----------------------------|-------------------|
| | <i>Number of companies</i> | <i>Percentage</i> |
| Extremely important | 15 | 45.5 |
| Important | 17 | 51.5 |
| Not important | 1 | 3.0 |
| Total | 33 | 100.0 |

I put into test the innovation uniqueness related to “By offering the right innovation that meets the needs and preferences of the particular customer”. In [1] 35.1% of the software companies use the above mentioned innovation uniqueness when developing their unique selling proposition (Table X).

Table X. Innovation Uniqueness

| <i>Ways of uniqueness</i> | <i>Number of companies</i> | <i>Percentage</i> |
|--|----------------------------|-------------------|
| By offering the lowest price | 6 | 7.8 |
| By offering the highest quality | 22 | 28.6 |
| By offering the best customer service | 22 | 28.6 |
| By offering the right innovation that meets the needs and preferences of the particular customer | 27 | 35.1 |
| Total | 77 | 100.0 |

Another question searches for answers related to the fields of investment in the software industry. In [1] 21.2% of the software companies in Bulgaria would invest in “Development of Unique selling proposition” (Table XI).

Table XI. Fields of investment for development of software innovations

| Question: In which of the following fields would you invest regarding your innovation activities? | | |
|---|----------------------------|-------------------|
| <i>Fields of Investments</i> | <i>Number of companies</i> | <i>Percentage</i> |
| Innovation Introduction to market | 12 | 36.4 |
| More effective market segmentation methods | 2 | 6.1 |
| Marketing researches on the customer preferences towards the innovation | 6 | 18.2 |

| | | |
|---|----|-------|
| Development of a Unique Selling Proposition | 7 | 21.2 |
| Sales Techniques | 6 | 18.2 |
| Total | 33 | 100.0 |

5. Focus on Sales Techniques

In the context of the software industry, I know from my experience working in this industry that sales techniques are a key factor of innovations. The software innovation is expensive. There is a trust and a long-term relationship between the innovative company and the customer. A salesperson takes part in the process, which aims to communicate the innovation value with the customer. Often the salesperson meets the customer and demonstrate the innovation. The salesperson should be able to put customers in the center of the sales process and influence their buying decision. This person help the customer find the right solution. Many sales techniques are studied in the scientific literature. I personally read the sales technique presented by Mark Benedict[8]. According to [8], “selling is a persuasion”. Selling is a process of convincing customers that you are the one they can trust and who they can feel confident about in the negotiation process. Each company must focus on four main reasons why customer will buy from you:

1. Customer buys because they likes you.
2. Customers buys because they trust you.
3. Customer buys because of price.
4. Customer buys because of the product characteristics they consider satisfying their needs.

It is shown in [1] that 51.5% of software companies define this factor as “important”, another 27.3% of them think of this factor as “extremely important” (Table XII). In [8] there are 25 sales technique presented, which I find very useful and relevant to the software industry.

Table XII. Choosing the right technique for closing the deal

| Question: How important are the Sale Techniques for the innovation success? | | |
|---|---------------------|------------|
| | Number of companies | Percentage |
| Extremely important | 9 | 27.3 |
| Important | 17 | 51.5 |
| Not important | 7 | 21.2 |
| Total | 33 | 100.0 |

IV. CONCLUSION

With my research and findings, I try to contribute to the efforts of the European countries to develop innovations that have value, innovations that drive the economic progress. Software companies should focus on the presented key factor of innovations. However, they should constantly search and find different ways to implement those factors. My next step is to research and present to you certain instruments that ensure the successful implementation of each of the key factors. The presented key factors are tested

in the software industry in Bulgaria but they could be used in other industries too.

ACKNOWLEDGMENT

The author would like to acknowledge and thank the Bulgarian Association of Software Companies (BASSCOM) for their participation and support throughout the process of the empirical research.

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