Dynamics of the popularity of Lean Software Development in the context of the popularity of Lean Management

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Abstract. With the passage of time the result of the development may be found in the appearance of the successive organizational solutions that are adequate to the challenges which are faced by human beings of the given time and the given developmental stage. There appear the concepts which, when found suitable, happen to be adapted to specialized applications. While relying on the „Lean" philosophy, the present paper is designed to investigate the process of such adaptation. In the discussion there was also raised the question whether the appearance of economic crisis might be one of the catalyst of the phenomena in question. Thanks to the study of trends that were identified in the internet there was demonstrated the course taken by the investigated processes. As a result there was obtained the information on some dependencies that could be found in the field of popularization of „Lean" philosophy.

Keywords: Lean Management, Lean Software Development, information management, information science

1 INTRODUCTION

In the face of growing competition and consolidation of globalization as well as intense turbulences in the economic environment, the present day companies became aware that there was a pressing need of verifying the model of activity that they used to apply. The challenges produced by the above mentioned phenomena caused that the managing staff began to search for the philosophy that would be oriented toward the growth of effectiveness. The philosophy was found in the concept of Lean Management (LM) which, through evolution and through adaptation to specific challenges faced by the IT branch, turned into the Lean Software Development (LSD). The present discussion focuses on comparing the growth of popularity in case of LM and in case of LSD as observable over the recent years. Likewise, the discussion draws the attention of the readers to the key external circumstances that accompanied the discussed growth. The paper made an assumption that one of the potential catalysts in the process of popularizing the organizing thought oriented toward „slimming" the company activities (and toward identifying new areas in which this thought could be implemented) was the economic crisis. The paragraphs that follow will present the empirical data demonstrating the compliance of the assumed thesis with the observed symptoms which, in their turn, illustrate the course taken by the discussed phenomena.

2 BACKGROUND

The Lean Management is a method that was oriented toward supplying to the customer the value that he expects to receive provided that this would be achieved with the lowermost cost and while exploiting the least proportion of stock. The method came to being in Japan in the Toyota company, its creators being Sakichi Toyoda, Kiichiro Toyoda and Taiichi Ohno (Holweg, 2007). The basis of their success consisted in eliminating those actions

accompanying the making of the product or rendering services, that did not add any value to the product or the service. It was John Krafcik (Krafcik, 1988) who, in 1988, introduced the very notion of „lean', the notion being popularized by James Womack, Daniel Jones, Daniel Roos (Womack, 1990). The method introduces a duty to observe two major principles: Jidoka (immediate halt of the activities upon detecting a mistake, and eliminating the latter thereby) and Just-in-Time (uninterrupted supply of only what is accurately needed). In this respect there were differentiated seven sources of potential waste (Turner, 2012):

-transport – it may generate waste because of moving products that are not actually required to perform the processing,

-inventory – it may give rise to the waste that results from components, work in process, and finished product not being processed,

-motion – it may generate waste caused by people or equipment moving or walking more than is required to perform the processing,

-waiting – it may generate waste because of waiting for the next production step, interruptions of production during shift change,

-overproduction - this is the waste caused by production ahead of demand,

-over processing - this is the waste caused by poor tool or product design creating activity,

-defects- this is the waste resulting from the effort involved in inspecting for and fixing defects.

The Lean Software Development provides an example of creative adaptation of the Lean Management method as made by Mary Poppendieck and Tom Poppendieck (Poppendieck, 2003) for the needs of IT branch. It is also in this case that we deal with the seven areas of perfecting the activities. The areas of perfecting assumed the form of the following postulates (Plenert, 2014):

-Eliminate Waste - eliminate everything not adding value to the customer,

-Amplify learning - it means that software development is also a continuous learning process,

- Decide as late as possible - it is good to assume that better results should be achieved with an options-based approach,

-Deliver as fast as possible- the most important value is time and the feedback that can be received,

- Empower the team - the most important is the self-organization of the working team,

-Build integrity in - it is important to respect the customer's overall experience of the system,

-See the whole - what must be respected is the balance in functioning of each part of the system to protect its integrity.

The universal nature of the discussed method creates the conditions that allow to reach spectacular effects. Thanks to this, in the favourable environmental circumstances, the popularity of the method could considerably grow in short time (Poppendieck, 2010). When viewed from a broader perspective, the philosophy of actions that makes up the basis of the "Lean" - marked concept favours the enterprising attitudes (Strojny, 2007). It i also a good method of limiting the risk of bankruptcy and the method of rationalizing the conducted activities (Bauer, 2011). Likewise, the method leads to the rationalization of organizing solutions in the field of cooperation with other organizations (Lipińska, 2012). This situation blends in with the currently observed trends in management (Warmińska, 2011). Such approach favours the taking of the decisions while demonstrating the sense of responsibility for the good of the customer (Stec-Rusiecka, 2010). In this case the key to success consists in the correct description of the decision-taking situation (Noworol, 2013). There exists the economically-justified limitation of the "slimming" of the organization (Bauer, 2010). The limitation may be found when one accessorily exploits other organizing methods (Cymanow, 2013).

3 METHODOLOGY

The assessment of the Lean Management and Lean Software Development popularity is based on the analysis of statistics that illustrate the number of recorded searches for the discussed terms in the Google service (since this is the most popular provider of this kind of services). From the point of view of information science specialists the internet is their natural working environment. They exploit it to find the information they need. Therefore it may be assumed that also in this case those that were interested resorted to the aforementioned device. The construction of the illustrations contained in the text is based on the relationships defined in the Google service in the following way (https://support.google.com/trends/answer/4355164?hl): "The numbers on the graph reflect how many searches have been done for a particular term, relative to the total number of searches done on Google over time. They do not represent absolute search volume numbers, because the data is normalized and presented on a scale from 0-100. Each point on the graph is divided by the highest point, or 100. When we don't have enough data, 0 is shown."

The period of time accepted for the examination allows to investigate the changes that followed before the moment the economic crisis of the recent time came into the open and the present. This provides for the opening of a large perspective from which the examined phenomena may be observed. In this case the source of information on the processes occurring in the global environment, and consequently the basis for making the potential comparisons, will be the largest – in its class – NASDAQ Stock Exchange. The image made available in the above demonstrated manner will be subsequently confronted with the data that describe the local and global interest in the Lean Management and the Lean Software Development.

4 RESULTS

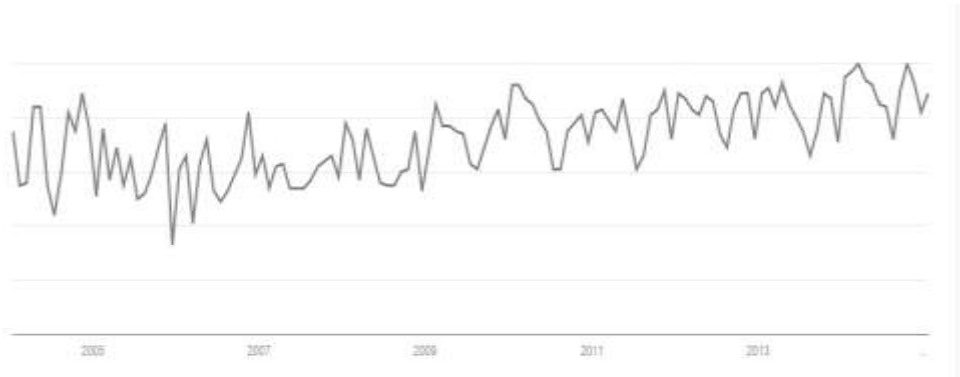

Fig. 1. The graph of the global popularity based on the query about Lean Management in the Google data base between 2004 and 2014.

Source: http://www.google.com/trends/explore#q=lean%20management (25.02.2015)

Figure 1 illustrates the interest in the internet search (with the use of Google service) for the information on the Lean Management. It shows a few key phenomena. The period that is referred to by the presented data may be divided into two parts. In 2004 - 2006 there came into view a delicate falling tendency. The minimum was found in 2006. Afterwards there appeared a stabile rising trend that has been continued since then. In the entire period there were observed the oscillations of approximate amplitude.

Fig. 2. The regional popularity based on the query about Lean Management in the Google data base between 2004 and 2014.

Source: http://www.google.com/trends/explore#q=lean%20management (25.02.2015)

In the investigated period the Lean Management attracted the largest interest in Europe, and particularly in Germany. Those that were next to search for the information on LM were the inquirers from North America and India. Australia may be also mentioned in that context. As can be seen, the countries that come into play are those in which there may be observed an intense development of branches that offer goods and services classified into ICT.

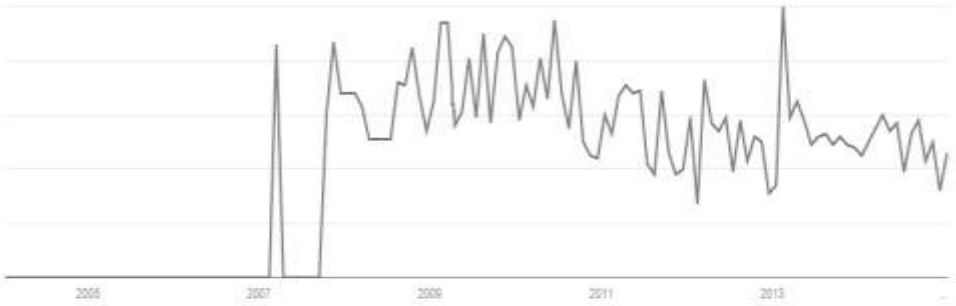

Fig. 3. The graph of the global popularity based on the query about Lean Software Development in the Google data base between 2004 and 2014.

Source: http://www.google.com/trends/explore#q=lean%20software%20development (25.02.2015)

The interest in the term Lean Software Development appeared fairly suddenly after 2007 and it immediately reached high value. After the first fascination period, somewhere around 2011, the interest in LSD stabilized at the level delicately lower than the average value of the years 2007 - 2010. In the entire period under investigation, the amplitude of oscillations is

more or less even although there are detectable punctual readings that remarkably exceed the average, this being observable in 2013.

Fig. 4. The regional popularity based on the query about Lean Software Development in the Google data base between 2004 and 2014.

Source: http://www.google.com/trends/explore#q=lean%20software%20development (25.02.2015)

In one country of the world, the United States of North America, there aroused an univocally high interest in the term Lean Software Development. Other countries produced a source of questions that referred to the discussed method. The questions were addressed to the Google service and were of minor importance.

Fig.5. The graph of the NASDAQ index between 2004 and 2014.

Source: http://www.money.pl/gielda/swiat/indeks;gieldowy,nasdaq,usa,2.html?smb=Nasdaq&ht=1&refresh=on&refresh_time=60&send=Zmie%F1 (25.02.2015)

The graph of the NASDAQ Stock Exchange index shows the two key moments of the change of trend as occurring in time. The first moment falls on the mid - 2007 when the previously stabile growths gave way to sudden falls. This tendency was continued until the turn of 2008. From that time on we have been dealing with the growths while the trend that emerges in this case has a more steep slope when compared with the tendency reported at the beginning of the period under investigation.

5 DISCUSSION

The compiled material shows an interesting phenomenon that illustrates the mode of popularizing the knowledge on the lean Management and the development of the method into what is called Lean Software Development. In that context it is first of all the year 2007 that may be particularly distinctive. The year is the key moment since 2007 was distinguished both by the reversal of the falling trend in the interest shown to the Lean Management as well by a sudden growth of popularity of the Lean Software Development. It is worth remembering that this was the moment when the first symptoms of the global economic crisis came to the open. This forced the companies to search for the radical cutting down of expenses. The analysed organizing methods were apparently appreciated by the potential users. This methods, in view of the potential that they disposed of and in view of the specificity of the manner of their application (since they were implemented exactly in order to get rid of the superfluous ballast imposed on the conducted activities and to facilitate concentrating on core business) proved to be a valuable proposal. If however the Lean Management emphasized its functioning in the global dimension, the Lean Software Development, in its turn, did it as a fairly local method. It may be assumed that what facilitated such development was the specific culture of conducting economic activities in the United States of North America. What might also be of significance was the intensity of competitive fight made therein. Last but not least of significance might be also the popularity of the authors of the method since they were aware of the local conditioning and therefore could adapt to it the initial method. This might also have an impact on the obtained picture of the situation.

These were probably various phenomena that affected the shape of trends that came to light in the illustrations printed in the earlier fragment of the paper. However it is worth concentrating on the most important factors. The latter must have left their mark on the reality of the conducting of activities by the companies of the ITC sector. In this respect we potentially deal with a very limited list of such factors. What certainly comes to the foreground is one phenomenon. Around 2007 all important occurrences in the global economy were under the impact of the crisis situation that was coming to the open. This was the original cause of the changes of Stock Exchange quotations, limitation of availability of the sources of financing, reduction of inclination among the potential buyers toward giving orders (particularly the orders for the investment goods which are the domain of the branch oriented at servicing the ICT market). The graph of the NASDAQ index - grouping first of all the technological partnerships - expressly shows how the investors reacted to the occurrences of 2007. What is characteristic is the fact that as early as the turn of 2008 there occurred a strong jump of index upward. This fact may be also interpreter in the context of intensified interest in the organizing methods such as the Lean Management or the Lean Software Development since these methods allowed the companies to improve the scope and the mode of the activities in which they were engaged. As can be seen, the Stock Exchange investors appreciated the efforts whose objective was to get rid of the superfluous ballast that burdened the business entities.

6 CONCLUSIONS

In the light of the compiled data and the observations that were made as well as the dependencies that were discovered it was possible to state that the catalyst of the growth of popularity of both the Lean management and also of the Lean Software Development was the global economic crisis. The latter forced the companies to search for the tools that would improve the mode of their functioning. The first of the discussed methods, applied to reach this end (LM), was found to be the tool equipped with a remarkably broader range of possibilities of its applying irrespective of the local conditioning. The second method (LSD) was characterized by its strong tie with the specific cultural and geographical context. The discovery of this fact allows to put forward the postulate of continuing the research in this field since the understanding of the disclosed mechanism will allow for the broader exploitation of the discussed tool as something fairly valuable.

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