UDC: 004.415.052:334.72]:303.725.3
Conference Paper

Agile Software Development in Practice

Florinda Imeri[1*], Afërina Skeja[1], Agon Memeti[1], Evren Etem[2]

[1]Department of Informatics, Faculty of Natural Sciences and Mathematics, MK*
[2] Yıldız Technical University, Turkey
**Corresponding Author: e-mail: florinda.imeri@unite.edu.mk*

Abstract

Due to rapid changes in the economic and technological environment, the organizations are placed under increasing pressure for agility and efficiency. Thus, the traditional structures tend to be replaced by newer, flexible structures, adapted to various events occurring inside and outside companies. Regarding Information Technology, the science of project management has become very important. Software development is becoming very complex and to make it even harder customer requirements changes very frequently making the process even more difficult. Traditional SDLC are not able to meet the requirements of the market. The agile software development methodology is introduced and has become one of the most commonly used software development techniques. Agile software development aims at fast, light and effective development that supports customer's business without being chaotic or rigors. However, little is known about how effective and efficient Agile practices are over the traditional methodologies, and what their success factors are. The paper analyzes agile methodology by identifying its strengths and weaknesses from a practical point of view. In this study, we have conducted a survey with a manager and developers at a software company in Turkey to identify critical success factors while using agile methodology. The paper is relevant for practitioners, by presenting the main benefits and disadvantages of using AGILE in Information Technology companies.

Keywords: agile software methodology, software companies, empirical analysis, questionnaire.

Introduction

The introduction of Web 2.0 and web-based services have changed the way software application are developed. In a web service environment, software applications present services that can easily communicate with software components, thus providing a faster and more productive communication between clients and entrepreneurs. To fulfill the requirements of the clients, software developing companies should release products and services more often. The involvement of a client as a "co-programmer" and as a source of feedback in real time is a big help for software companies to improve the products regularly.

The aim of software companies is to develop products with an adequate quality fulfilling customer's requirement, by respecting the time and the budget constraints. The most important factor that affects to the triangle of objectives (quality, time and cost) is with no doubt the methodology used to manage and develop a project. Different project methodologies are being used in software project management due to different attributes and complexity of software projects. Among them the most frequently used methodologies are: Waterfall, Spiral, Incremental, Iterative and Evolutionary and recently it is Agile methodology that is being used as well [1][2].

In such a dynamic and interrelated business system, many companies are adopting the agile software development. The "Agile Movement" in the software industry saw the light of day with the Agile Software Development Manifesto published by a group of software practitioners and consultants in 2001 [3].

The agile project management is a combination of iterative and incremental methodology and is being considered as advantageous because enables to: quickly release products to the market, respond quickly to continually changing requirements, and deliver the software product to the customer in a very short time [4] .

Method

Data for this study were collected through a survey of software development professionals who are adopters of agile development in a software company in Turkey. The survey data presented in this study are gathered using a questionnaire. But, to fill in some gaps a senior manager who has been, and is, part of some agile software projects is interviewed. Questions of the questionnaire used in this study are used before from several authors and recently is used by Donmez [5]. Questions, total 67, were divided into several sections as following a**)** investments for involving and encouraging Agile processes, **b)** evaluation of efficiency and effectiveness of Agile development methodology, **c)** evaluation of the benefits of the Agile methodology, **d)** evaluations of the tools used and the factors affecting the selection of agile tools and issues before implementing successful agile methods. To reflect the level of perception of the question by the respondent a 5-point Likert scale was used.

Results

Below we will present the answers given by participants. As regarding the first section, the investing involving and encouraging of agile processes the graph below gives a clearer view of the answers given by the participants.

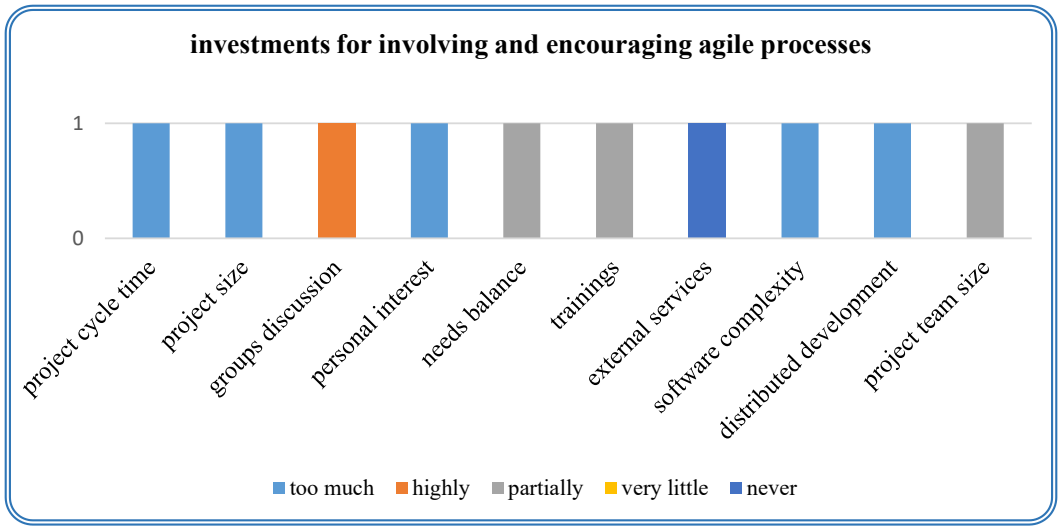

Fig. 1.

When we examined *the evaluation of efficiency and effectiveness of Agile development methodology* part, results are as shown in the chart below, fig. 2.

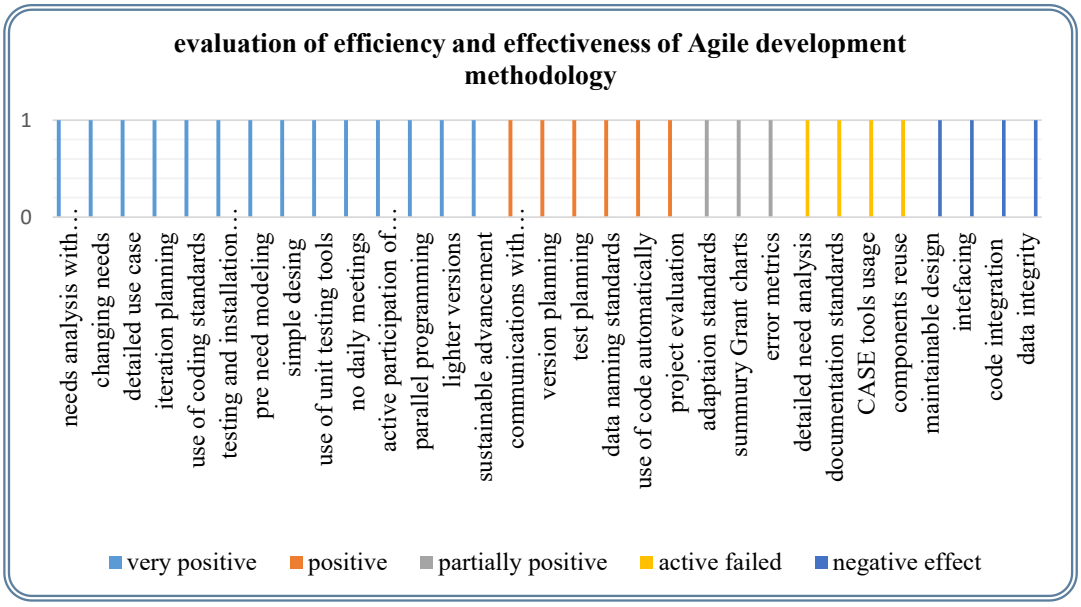

Fig. 2.

As regarding *the evaluation of the benefits of the Agile methodology,* answers are presented in the chart below, fig.3.

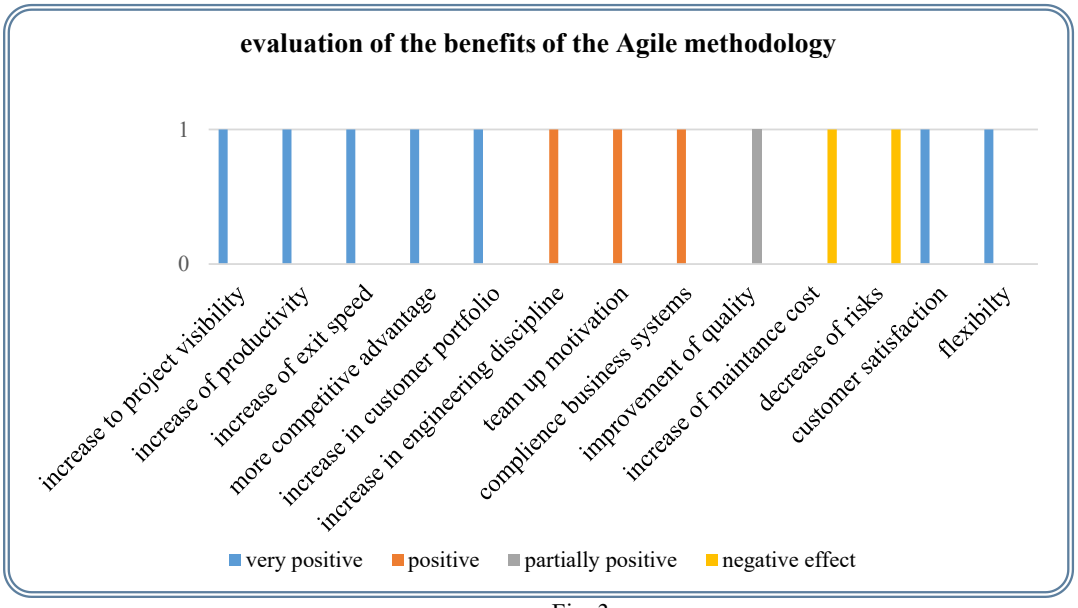

Fig. 3.

And the last part of the questionnaire which tried to *evaluate the tools used and the factors affecting the selection of agile tools and issues before implementing successful agile methods,* chart below, fig. 4, shows the answers.

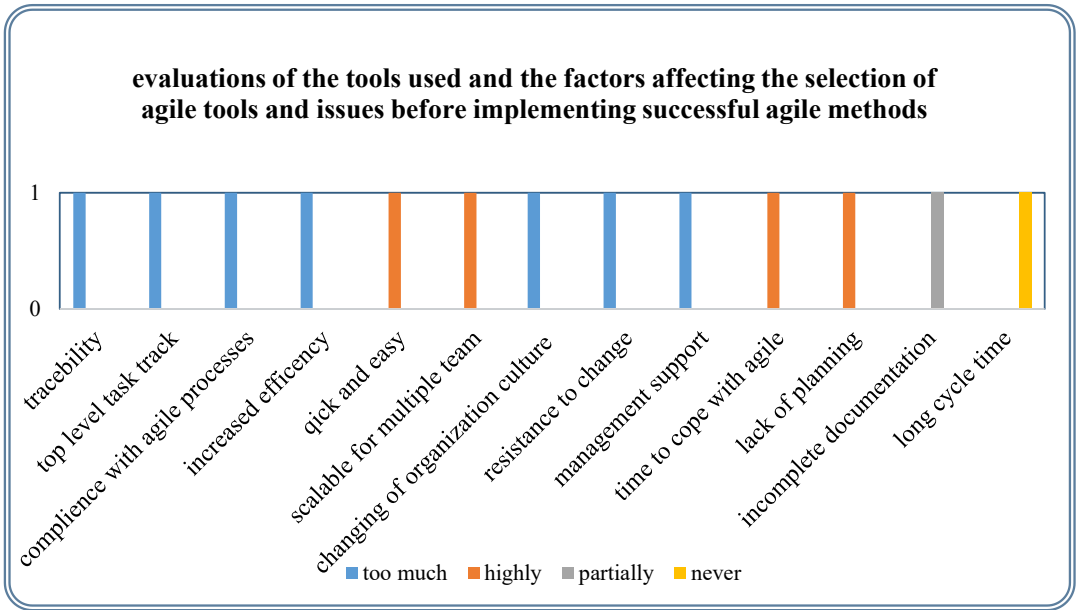

Fig. 4.

We also interviewed the manager, to have better understanding regarding the challenges and benefits of successful implementation of agile methodology, within the period of 2 years, and the answers are as shown in table.

Is training necessary for the team to use agile methodology?	Yes!
The success rate of agile projects in your organization	76-100 (%).
The number of projects you use agile method in your institution	21-50 (%).
The number of employees in the largest project working with agile methodology in your organization	51+ (%).
The number of people in your average team in agile projects at your institution	21-50 (%).
If you are going to compare with another methodology that you used before, why would you prefer agile management?	In terms of providing a competitive edge in the market to meet the customer's needs and the time of exit to the market.

Conclusion

A process of software development has been the focus of interest of many researchers due to a large percentage of failures in the software industry, ranging from inability to provide software solution that fits to the requirements, to providing solutions that are a maintenance nightmare or in the worst case inability to provide any solution at all. Agile software development provides an effective solution to the challenges faced by the software industry including ever-increasing software complexity, dynamic user requirements, low budgets and tight schedules. The sudden increase in adoption of Agile methods across the software industry proves their usefulness and effectiveness. Agile processes ensure frequent interaction between developers and customers, by offering addition and improved return on investment, together with quick responsiveness to changing software demands. With our empirical study, we intend to contribute to the already existing knowledge about the benefits and challenges of agile methodology.

References

[1]. C. Gokhan and Z. Karakaya, "Project Management Problems in Agile Methodologies : A Systematic Mapping Study," in *International Conference on Computer Science and Engineering*, 2016, no. October.
[2]. A. Cockburn, *Agile Software Development*. Addison-Wesley Professional, 2002.
[3]. M. Beedle *et al.*, "Manifesto for Agile Software Development," pp. 2–3, 2001.
[4]. B. Boehm and R. Turner, "Observation on Balancing Discipline and Agility," in *Proceedings of the Agile Development Conference*, 2003, p. 32.
[5]. E. Donmez, "Çevik yazilim gelistirme surecinde kritik basari faktorlerinin belirlenmesi ve onceliklendirilmesine yonelik bir ornek calisma", 2009.