Chapter 6
Agile Software:
Body of Knowledge

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ABSTRACT

The term Agile Method of software development was coined in the 2001.This approach is characterized with creativity, flexibility, adaptability, responsiveness, and human-centricity. Researchers have suggested that the complex, uncertain, and ever-changing environment is pushing developers to adopt agile methods rather than traditional software development. Agile methodologist claim that their Agile methods is the answer for the software engineering chaotic situation, in which projects are exceeding their time and budget limits, requirements are not fulfilled, and consequently ending up with unsatisfied customers. In this chapter we will explain agile methodology, its general characteristics, and quick description of the famous agile methods known in the industry and research.

INTRODUCTION

The term Agile Method of software development was coined in the 2001 (Agile Manafesto). This approach is characterized with creativity, flexibility, adaptability, responsiveness, and human-centricity (Abrahamsson, et al. 2002). Researchers have suggested that the complex, uncertain, and ever-changing environment is pushing developers to adopt agile methods rather than traditional software development. That is because the uncertain environment is pushing for flexibility in changing requirements (Manninen & Berki 2004). Moreover, the advancements made in developing users knowledge of computers and computer application made it possible for users to actively participate in the development process, a matter that is lacking in traditional software development processes (Monochristou and Vlachopoulou 2007).

This agility, however, is challenged with some quality-related issues (Bass, 2006). That is, despite of the quality features in agile methods, there is some compromise on the amount of information and knowledge communicated to customers

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arising due to the lack of documentation that strongly characterizes agile methods (Ambler 2005, McBreen 2003, Berki 2006). This was due to the innate trend in agile methods to concentrate on human-based techniques in communicating knowledge such as on-site-customer, pair programming, and daily short meetings.

The human-centricity of Agile methods implies that the main focus of the software production process is to maximize the knowledge transferred and shared among various stakeholders of the software project. Hence, we will investigate the knowledge component in the main Agile method: extreme programming, despite the fact the other Agile methods show clear KM techniques.

Agile methods in fact came as response to the failure software projects were facing. Agile methods came after decades of applying traditional, process-based software development methodologies that are characterized with heavy documentation, strong emphasis on the process, and less communication with customers (Beck, 2000)

The rest of the chapter is organized as follows: first we will introduce agile methods history, explaining how agile methods emerged through last two decades. Then we will explain what are the major agile principles, concepts, and trends. After that we will move to discuss the most famous agile methods, namely: extreme programming, scrum, Feature Driven Development FDD, Adaptive Software Development, ASD, Crystal, Lean Software Development, and Agile Modeling. Finally we conclude our chapter by discussing agile methods pros and cons as found in the literature.

AGILE DEVELOPMENT HISTORY

On February 11-13, 2001, representatives from Extreme Programming, SCRUM, DSDM, Adaptive Software Development, Crystal, Feature-Driven Development, Pragmatic Programming, and others sympathetic to the need for an alternative to documentation driven, heavyweight software development processes, gathered at the Snowbird resort in Utah to form what is known now by the Agile Alliance.

However, this was just to coin the name Agile, not to say that agile methodologies were born at that time. Several agile methods had been by that time already born and applied in throughout the 1990's. Figure 1 shows the early history of Agile methods.

From the figure we can see the following observations from the history of agile methods development:

- Agile methods were already in practice for more than half a decade before forming the Agile Alliance.
- The first two agile methods were DSDM and Scrum.
- Rapid Application Development and object-oriented development could be considered the transitional method between traditional development methods and agile methods.
- Between 1998 and 2002 is the most productive period for agile methods as the Agile Alliance was formed and many agile methods came into existence.
- After 2002 agile methods use in the industry has grown exponentially (Begel and Nagappan 2007,) with XP and Scrum taking the lead.

AGILE PRINCIPLES AND TECHNIQUES

Agile Principles

Agile software development is not a set of tools or a single methodology, but a philosophy in its own. Agile was a significant departure from the heavyweight document-driven software development methodologies such as waterfall and spiral