

Chapter 9

ASD–BI:

A Knowledge Discovery Process Modeling Based on Adaptive Software Development Agile Methodology

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ABSTRACT

Business Intelligence applications are of vital importance for many organizations. These applications still face failures in determining the process model adopted. In this chapter, we are proposing a new knowledge discovery process model named “ASD-BI” that is based on adaptive software development (ASD) agile methodology. ASD-BI process model was proposed to enhance the way of building business intelligence and data mining applications.

The main contribution of this chapter is the demonstration that ASD-BI is adaptive to environment changes, enhances knowledge capturing and sharing, and helps in implementing and achieving organization’s strategy. ASD-BI process model will be validated by using a case study on higher education.

INTRODUCTION

Software is considered as an important industry since more than 40 years. Software is intangible and more easily adapted than a physical product.

Software development process was one of the most important research targets as it mainly affects software project success or failure.

The main three core areas affecting any software project are: quality, cost, and time. The challenge is to produce high quality software in time constrained market with the minimum cost.

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Traditional software development processes are characterized by rigid control mechanisms with heavy documentation which make it difficult to validate a successful combination between quality, cost, and time.

Agile methods may make it less costly to customize and adapt development processes. Agile processes focus on code rather than documentation (Keith, 2006). According to the “Manifesto for Agile Software Development” (ALLIANCE, 2001), agile process philosophy is based on the following four values:

- Individuals and interactions over processes and tools
- Working software over comprehensive documentation
- Customer collaboration over contract negotiation
- Responding to change over following a plan

Agile modeling has many process centric software management methods, such as: Adaptive Software Development (ASD), Extreme Programming (XP), Rational Unified Process (RUP), Lean Development, SCRUM, and Crystal Light methods.

Agile methods share the same properties by focusing on people, results, minimal methods, and maximum collaboration. Agile approaches are best fit when requirements are uncertain or volatile; this can happen due to business dynamism, and rapid evolving markets. It's difficult to practice traditional methodologies in such unstable evolving markets, thus agile methodologies were developed as a solution to software development processes in an uncertain environments (high speed, high change) (Highsmith, 2000; Keith, 2006; Abdullah, Holcombe, & Gheorge, 2006).

ASD agile method (developed by Jim Highsmith) is one of adaptive approaches (Pressman, 2001). ASD is based on the idea of developing adaptive systems (i.e. Chaos theory) from which

agile and adaptive processes were arise (Highsmith, 2000; Keith, 2006). ASD considers outcomes are unpredictable, and planning is paradox. ASD is not a methodology for doing software project, but rather it is an approach that could be adopted by organizations in an unpredictable environment (Keith, 2006).

ASD replaces the static Plan-Build-Revise life-cycle, with the dynamic Speculate-Collaborate-Learn life cycle (Figure 1).

“Speculate” replaces “Plan” as planning is too deterministic in an unpredictable world.

“Collaboration” replaces “Build” as ASD's processes recognize the role of people in producing successful products. Collaboration can make people more creative, and help producing creativity answers in an unpredictable environment.

“Learning” replaces “Revise” as ASD recognizes that knowledge can be gained through experience.

RELATED WORKS

To our knowledge, there is no other work that applies agile methodologies on knowledge discovery process modeling. Therefore, we describe in this section works with different approaches but related to our work in some manner.

Knowledge Discovery Process (KDP) modeling are mainly categorized into the following main four categories: traditional KDP, Ontology-based, web-based, and agile-based approaches.

TRADITIONAL KDP APPROACH

This is the most used approach for knowledge discovery modeling. Starting with (Fayyad, Piatetsky-Shapiro, & Smyth, 1996) model, most of the KDP modeling follows its same steps. This model was one of the first attempts towards formalizing the KDP modeling within a common framework (Cios, Pedrycz, Swiniarski, & Kurgan,

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