14 Requirements Engineering for Agile Methods

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Abstract: Collecting, understanding, and managing requirements is a critical aspect in all development methods. This is true for Agile Methods as well. In particular, several agile practices deal with requirements in order to implement them correctly and satisfy the needs of the customer. These practices focus on a continuous interaction with the customer to address the requirements evolution over time, prioritize them, and deliver the most valuable functionalities first. This chapter introduces Agile Methods as the implementation of the principles of the lean production in software development. Therefore, Agile Methods focus on continuous process improvement through the identification and the removal of waste, whatever does not add value for the customer.

Keywords: Agile methods, Lean management, Process management, Requirements management, Variability management.

14.1 Introduction

Agile Methods (AMs) are a family of software development processes that have become popular during the last few years [1, 7, 14]. Their aim is to deliver products faster, with high quality, and satisfy customer needs through the application of the principles of the lean production to software development [25].

Lean production [36] has been conceived during the ’50s at Toyota [23]. It involves several practices that are now part of most manufacturing processes, such as just-in-time development, total quality management, and continuous process improvement. The principle of lean production is the constant identification and removal of waste (muda in Japanese), that is, anything that does not add value for the customer to the final product. Being rooted on lean production, AMs focus on:

1. Delivering value for the customer
2. Ensuring that the customer understand such value and be satisfied by the project

Delivering value to the customer implies that the development team has to produce only what provides value and remove (or at least reduce to the minimum) everything else. AMs pose a lot of emphasis in producing and delivering to the customer only those features that are useful. Producing anything that is not required is considered a mistake. Adding a feature that is not needed not only consumes effort without adding customer value but also creates extra code, which may contain errors and make the code longer and more complex to maintain, to correct and to improve. This waste includes general architectures that are used
only partially or reusable components with functionalities that are likely to be never used [25].

To achieve such elimination of waste, AMs claim to be [7] (a) adaptive rather than predictive, and (b) people-oriented rather than process-oriented. To ensure customer satisfaction, a close collaboration between the development team and the customer is sought, so that:

- Requirements are fully identified and correctly understood
- Final products reflects what the customer needs, no more and no less

Overall, requirement engineering is of paramount importance for AMs. This chapter introduces AMs and describes their approach to requirements engineering. It is mainly related to:

- Chapter 2: most of the techniques for requirements elicitation do not change much in an agile environment.
- Chapter 4: the prioritization of requirements is of paramount importance, since AMs focus on the implementation of the most valuable features for the customer.
- Chapter 5: in order to implement only high priority features, the identification of the interaction among features and their decoupling is extremely important.
- Chapter 7: the identification of the requirements to include in a single iteration is based on the negotiation between the customer and the development team.

The chapter is organized as follows: Section 14.2 briefly introduces Agile Methods. Section 14.3 identifies common problems in requirements engineering. Section 14.4 describes the agile approach to requirements engineering. Section 14.5 deals with the role and responsibility of customers, managers, and developers in an Agile environment. Section 14.6 briefly introduces tools for requirements management in Agile Methods. Section 14.7 draws the conclusions.

14.2 Agile Methods

AMs are a family of development techniques designed to deliver products on time, on budget, and with high quality and customer satisfaction. This family includes several and very different methods. The most popular include:

- eXtreme Programming (XP) [6]
- Scrum [28]
- Dynamic Systems Development Method (DSDM) [32]
- Adaptive Software Development (ASD) [17]
- The Crystal family [12]