Agile Project Management in Product Life Cycle

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ABSTRACT

Agile project management methodologies are becoming more popular day by day. They provide flexibility and adaptability to customers and project teams in terms of planning and competition. Due to these benefits, the share of the agile managed projects has been increasing. Most of the agile projects are executed on products. On the other hand, every product has a life cycle. Just as living beings, it is born, it grows/changes, matures, loses ground and completes its life and dies. The stages that define the product life in this way were put forth in The Product Life Cycle Theory. One or generally more projects and various operational works accompany the product throughout the product life. In this study, the effects of applying agile project management principles on product’s life cycle are analyzed. In order to receive effective results from the agile project that accompany the product, project is suggested to be divided into phases and these phases are proposed to be differentiated according to the stage of the product. Furthermore, Product Life-time Project concept is introduced with agile methodologies. It reserves a project and its team to a specific product during its whole life. Product Life-time Project is applied to software development and automotive industries and the results are presented and compared with the traditional approach.

KEYWORDS

Agile Project Management, Product Life Cycle, Product Life-time Project (PLP), Project Phase

1. INTRODUCTION

Project is one of the trendy 20th and 21st century words in business world with different perceptions and scopes. Within different definitions, Project Management Institute’s (PMI) wording has been accepted widely. Project is defined by PMI as “a temporary endeavor designed to create a unique product, service or result” (PMI, 2013). Based on this definition, the project life cycle is formulized as a set of phases that projects go through from initiation to closure (PMI, 2013).

In the project management world, agile methodologies appeared mainly in 1990s in different locations for the same purposes under different names (Shore & Warden, 2008). Their common purposes were to increase productivity, to respond to change requests and competition, to progress with small but working increments and to lighten bureaucracy of processes and documentation. These methodologies were synchronized in terms of their commonalities in 2001 as Agile Manifesto (Beck et al., 2001). In the same manifesto, 12 basic principles of agile approach were presented. Subsequently, the practice of agile approaches and academic research on their success factors increased exponentially mainly in software development and production sectors (Chow & Cao, 2008; Gunnar & Vossen, 2012; Hauder et al., 2014).

The agile approaches have been applied in projects with dedicated team to the product and also to the project (Kropp & Meier, 2015). Therefore, the productivity of agile teams was determined to be higher than traditional approaches (Melo et al., 2013). Similar to the productivity, responding to change request has been managed better in agile world with the help of the prioritized product backlog.

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(Cohn, 2004). The priorities of product backlog have been assigned and changed by customer or its representative namely product owner (Adkins, 2010). Prioritization of items determined the growth trend of the product, therefore special care has been required (Daneva et al., 2013). Items for product backlog were selected to form work packages which are planned as releases and small increments namely iterations (Sliger & Broderick, 2008).

The relation between agile project management methodologies and product life cycle is analyzed in this article. The main focus of the study is to put forth the idea of applying and adapting agile project management perspective according to the related product’s life cycle stage. Agile phases in project are shaped according to the product’s life cycle stage. In this way, projects can contribute more value to the success of the product. Moreover, Product Life-time Project concept is introduced. This concept includes managing same product throughout its life cycle with the same project team and under same projects’ umbrella is suggested.

The study is organized in six sections. In the following section, a brief literature review is presented on products life cycle and related studies. Afterwards configuration of agile projects according to the product life cycle stages is proposed. In the fourth section, sample projects are examined together with the customer satisfaction surveys for software development and automotive industries. In the fifth section, the outcomes presented in the fourth section and methodology part are compared as a discussion.

2. LITERATURE REVIEW

It was proposed that like living creatures, products have a life cycle (Vernon, 1966) as illustrated in Figure 1 in the Appendix, and the idea has been widely accepted. In literature, based on this proposition, life cycle stages were studied from different perspectives (Thorelli & Burnett, 1981; Gmeling & Seuring, 2014). Some of the studies concentrated on analyzing and modeling product development processes (Sanders 2013, Peng et al., 2014; Cui et al., 2014, Nagashima et al., 2015). Relating product and project in terms of work breakdown structure was studied for complex system projects (Sharon & Dori, 2014). Adapting projects according to the product’s life cycle stage was proposed with New Product Project and Product Uplift Project concepts (Altunel, 2014).

Basic characteristics of product life cycle stages are explained here. In the development stage, from the product’s point of view, developing first a robust sample is the primary target. This stage is the innovation step for the new product, and for successful innovation special care is required (Cooper & Kleinschmidt 1987, Ernst 2002). For this purpose, project should focus on defining the scope of the prototype and producing it by employing Proof of Concept (PoC) perspective. Starting from product’s vision, the basic features should be defined and implemented in an iterative fashion. Since producing a robust prototype is the critical point at this stage, technical excellence and good design are prominent principles from the agile world. Prototyping and testing phases are sedentary in some industries to reach technical excellence. For example, a new airplane is prototyped, tested and developed until the performance criteria are met. New television or software or an automobile is tested under certain circumstances. If the product is unique and not possible to test as a whole, then a miniaturized model is produced and tested. Examples can be gas platforms, ships, buildings which are unique and expensive to test as a whole. When prototyping and testing steps are operated without adequate details, undetected problems are likely to appear in the end product, and fixing them is costly in most of the cases (Segismundo & Miguel, 2008). Hence, to reach technical goals, work can be designed in iterations and the whole development stage can be formulated as a project
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