How Can Agile Methodologies Be Used to Enhance the Success of Information Technology Projects?

Dothang Truong, Department of Doctoral Studies, Embry-Riddle Aeronautical University, Daytona Beach, FL, USA
Thawatchai Jitbaipoon, Department of Information Systems and Operations Management, Ball State University, Muncie, IN, USA

ABSTRACT

Dynamic and unpredictable business environments in the information technology (IT) sector have led to a rapid growth of agile methodologies. Organizations claim that using agile methodologies can enhance the success of IT projects in such environments. However, fluctuating patterns of successful and failed agile IT projects recently raise a question about a path to successful IT projects using agile methodologies. The purpose of this research is to examine agile driven factors and relationships between them and IT project success. Data collected from a pilot survey of agile practitioners were used to confirm important agile driven factors: Agile Team Capability, IT Development Agility, and Agile Culture. The research also tested a structural model that examined indirect impacts of IT development agility and agile culture on project success via a mediation of agile team capability. Theoretical and practical implications are also discussed.

KEYWORDS

Agile Culture, Agile Methodologies, Agile Project Management, Agile Team Capability, Development Agility, IT Project Success

INTRODUCTION

Agile development methodologies have grown rapidly in the past decade and are used by organizations as an effective strategy to complete information technology (IT) projects (Conboy, 2009). Agile practitioners claim that agile methodologies better handle the dynamic nature of business environments by focusing on short iterations of clearly defined deliverables and direct communication with partners in the development process (Cervone, 2011). Agile methodologies enable a project team to adapt quickly to unpredictable and rapidly changing requirements existing in most software development projects. Despite many reported benefits, agile methodologies still present some disadvantages in managing complex projects and dealing with environmental dynamism (Nerur et al., 2005; Barlow et al., 2011; Cervone, 2011).

As more and more IT projects engage agile methodologies, there are emerging patterns of success and failure. This raises a question of whether agile methodologies have been used properly and effectively to enhance IT projects. As the adoption of agile methodologies continues to grow, IT practitioners need to understand what agile driven factors play are important and how they drive the success of IT projects.

While recent research on agile methodologies has shown promising results, practical implications have not yet been validated (Tripp, 2012). Most empirical studies in agile development focused on
examining benefits of agile methodologies or agile practice adoption with more concentration on particular types of agile methodologies, such as Scrum or Extreme Programming (XP) (Maruping et al., 2009, Harris et al., 2009; Moe et al., 2010; Lee, 2012). Only a small number of empirical studies investigated factors that affected the success of IT projects using agile methodologies, the so-called agile IT projects (Chow & Cao, 2008; Misra et al., 2009; Wan & Wang, 2011; Stankovic et al., 2013; Sheffield & Lemétayer, 2013). These studies used the critical success factor method to examine direct effects of impact factors (e.g., organizational factors, people factors, technical factors, and process factors) on project success, but failed to explain the structural interrelationship among these variables and how the project success can be achieved. In addition, while these studies developed constructs measuring impact factors, they did not incorporate differences between traditional and agile methodologies in their models. The role of agile driven processes and agile driven organizations in the success of IT projects was not adequately addressed. Few studies examined the importance of agility at some level, but only focused on a specific aspect of project management, thereby missing the interrelationship among factors (Trip, 2012; Moe et al., 2010; Lee, 2012; Sheffield & Lemétayer, 2013). In order to achieve a success in an agile IT project, following a step-by-step process is not enough. Organizations need to embrace agile philosophy in all organizational and project management aspects, and create agile driven project development process, culture, and team capability. It should be noted that agile capability of a project team is a crucial factor that glues other factors together to form a path to a successful project.

The purpose of this research is to develop and validate agile driven factors and their measurements, and examine how these factors and their interrelationships influence agile IT project success. A pilot survey was conducted to test the reliability and validity of the survey instrument, and preliminarily test proposed hypotheses. The paper is organized as follows. In the next section, literature review is provided to discuss relevant findings in existing studies along with their shortcomings. Then, a proposed research model is presented along with hypothesis development. The next section describes the research methodology and data collection process, followed by result presentation and interpretation. Finally, academic contributions and managerial implications are discussed.

LITERATURE REVIEW

Agile Methodologies in IT Projects: Previous Works

Conboy (2009) defines agility as “the continual readiness of an ISD (Information System Development) method to rapidly or inherently create change, proactively or reactively embrace change, and learn from change while contributing to perceived customer value (economy, quality, and simplicity), through its collective components and relationships with its environment”. The most common agile methods include Extreme Programming (XP), Scrum, Feature-Driven Development (FDD), Dynamic System Development Method (DSDM), Adaptive Software Development (ASD), Crystal, and Lean Software Development (LD) (Ribeiro & Fernandes, 2010).

Agile development methodologies are different from traditional methodologies (waterfalls or linear processes) in several ways. First, with traditional methodologies about one-third of the project time is spent in the planning phase (PMBOK, 2009). In contrast, less than 10% of the project time is recommended for up-front planning with agile methodologies (Anderson, 2004; Highsmith, 2002). Second, traditional methodologies usually are intended to deliver the project outcomes at the end of the project. On the other hand, early delivery of project outcomes is expected in agile projects through an iterative process. Because of this focus on early delivery, agile methodologies are claimed to increase the potential that business value will be delivered, while at the same time lower the risk that changes in business environments will reduce the usefulness of the system before it is delivered (Trip, 2012).

While a number of empirical studies have been conducted in agile methodologies, only a few of them focused on factors affecting agile project success. Table 1 summarizes these studies along with

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