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Understanding Agile Software Development Team Adaptation Processes

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ABSTRACT

This study is about team adaptation from a continuous change perspective. The purpose was to investigate how agile software development teams in a Nordic financial institution adapt to task-based triggers. A single case study was conducted of three software development teams in a product unit reporting that they worked in agile ways. One of the main findings is that the agile software development teams sought to define tasks to be worked on individually. The adaptation triggers occurring during taskwork mainly prompt task-related interaction. In addition, the findings support that these adaptation triggers can either prompt small adjustments to taskwork or be more severe and move the focus to evaluation and planning activities before taskwork can be continued. The authors propose a model describing how agile software development teams adapt to task-based triggers based on the findings.

KEYWORDS

Agile Software Development, Agility, Case Study, Information Systems Development, Team Adaptation, Team Processes

INTRODUCTION

All information systems development has inherent risks. If those risks are not handled properly, the development may exceed its schedule or budget, or the resulting product will fail to meet the customers' needs. Approaches to information system development intended to improve performance outcomes by promoting agility have become increasingly popular in the last few decades (Campanelli & Parreiras, 2015; Cockburn & Highsmith, 2001; Conforto et al., 2016; Dingsøyr et al., 2012; Tam et al., 2020). Such approaches often are referred to collectively as "agile software development," which many link to a set of defined methods and practices emphasizing iterative problem-solving, close collaboration and frequent customer interaction (Dybå & Dingsøyr, 2008). Agile software development represents a shift in philosophy that departs from what is considered "traditional" (Nerur & Balijepally, 2007),

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spurred by the inadequacy of traditional, plan-driven approaches in handling the extensive rate of change in business and technology (Lee & Xia, 2010). The core of agile software development is agility, which most researchers agree concerns software development teams' ability to handle change successfully in order to create business value (Conboy, 2009; Conforto et al., 2016; Lee & Xia, 2010; Serrador & Pinto, 2015).

Because agility in information system development involves successful adaptation to change, which is a crucial aspect of team effectiveness (Burke et al., 2006; Mathieu et al., 2008), the team processes involved in how software development teams adapt to change are important. Team processes refer to how team members work with each other in order to facilitate goal-oriented work (Marks et al., 2001). Team adaptation can be considered a process involving "adjustments to relevant team processes […] in response to the disruption or trigger giving rise to the need for adaptation" (Maynard et al., 2015, p. 656). Even though human aspects of information system development long have been acknowledged as imperative (Cockburn & Highsmith, 2001), relatively few studies on information system development have leveraged the knowledge gained from the social sciences to address such issues (Lenberg et al., 2015). A literature search revealed that only Kude et al. (2014) leveraged team adaptation theory to better understand agility in information system development. Because the team adaptation literature revolves around how teams adapt to changing demands (Maynard et al., 2015), it can contribute to understanding how software development teams handle change to create business value.

The team adaptation literature often seems to focus on adaptation to novel or disruptive situations (e.g., Burke et al., 2006), thus mainly employing an episodic view of change and subsequent adaptation. The current study conceptualizes change as both episodic and continuous in nature (Hanelt et al., 2021). Hence, the current study differs from Kude et al. (2014), who emphasized team adaptation processes emerging from disruptive events. To capture the continuous change, we mainly focus on adaptation to task-based triggers, i.e., adaptation triggers emerging during team members' "interactions with tasks, tools, machines and systems" (Bowers et al., 1997, p. 90, as cited in Marks et al., 2001, p. 357). Adaptation triggers are "those cues that […] can prompt teams to pursue modifications in order to complete their task" (Maynard et al., 2015, p. 653). Many of these triggers cause uncertain events and risk during software development. As this study will illustrate, a definite distinction between the team- and individual levels of analysis is misguiding for the purposes of this study, which would imply that it is appropriate to employ a micro-dynamic approach to team research. This approach emphasizes the "interdependent relations and activities between individuals, and more importantly, […] the organizing aspect of those activities" (Humphrey & Aime, 2014, p. 450). It also entails considering the context in which the software development teams work, even though the focal point of view here is the software development teams themselves.

Baard et al. (2014) reported a lack of field studies within the team adaptation literature as well as empirical studies on team adaptation processes in particular. Furthermore, Maynard et al. (2015) argued that team adaptation theories have largely disregarded the types and severity of adaptation triggers and the resultant team processes. A literature search revealed no other studies considering the team adaptation process emphasizing continuous change within the literature on agility in information system development. Thus, the purpose of this study is to employ a micro-dynamic view of teams and explore the practitioners' experiences with task-based triggers requiring software development teams to adapt as well as the subsequent adjustments to relevant team processes. The present study was conducted in a Nordic financial institution because of the unique access we had to a theoretically interesting case. Hence, we sought to answer the following research question: How do agile software development teams in a Nordic financial institution adapt to task-based triggers? To answer this research question, we conducted a case study on three agile software development teams in a product unit responsible for developing one product in a Nordic financial institution.