



The agility construct on project management theory

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Abstract

Definitions of agility found in the project management (PM) and agile project management (APM) disciplines are inconsistent, incomplete and lack clarity. This paper presents a complete definition of the agility construct, built from a combination of systematic literature review and frame semantics methodology. A survey with 171 projects with different innovation levels and industry sectors combined with factor analysis was used to first validate the construct. The results show that the agility construct is cohesive and useful in different PM contexts. The implications for advancing the PM theory and practice are threefold: i) agility should be considered a team's performance, rather than a mere adjective for practices and methods; ii) agility, as a performance, might be dependent upon a combination of organization, team and project factors; and iii) the agility performance level can be measured within two main factors: rapid project planning change and active customer involvement.

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1. Introduction

Agile project management (APM) is an emerging approach that is gaining ground in the business world, especially in high-tech companies and I.T. software development projects (Lee and Yong, 2010; Persson et al., 2012). This approach has evolved since the creation of the Agile Manifesto for Software Development in 2001 (www.agilemanifesto.org) by a group of practitioners that proposed many of the “agile” (or lightweight) methods, practices and tools used today.

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Recent industry pools and market surveys, as *State of Agile Survey* (2014), have shown that the APM approach has gained great attention. Additionally, the term “agility” has been discussed in boardrooms across the globe as a way to gain competitiveness and to improve innovation capabilities (see for example, Sull, 2009).

Several studies about the application of the agile methods are found in the literature, especially for software development (Dybå and Dingsøyr, 2008). The current discussion is on how to apply these methods beyond the scope of I.T. (Conforto et al., 2014) and on how to measure the performance and impact of these APM practices (Qumer and Henderson-Sellers, 2006; Mafakheri et al., 2008; Sheffield and Lemétayer, 2013).

The APM approach, which considers methods, tools and techniques, was created to improve the performance of the project by promoting “agility”. Uncovering what is agility should be the first step in order to be able to verify and validate

results from this theory. Nevertheless, there is a gap in the literature regarding the investigation of the “agility construct” for project management. The majority of the studies have focused on agile manufacturing, as Sharifi and Zhang (2001), but this is another knowledge area not directly related with the specific context of project management.

In addition, some references that use the “agility construct” are not well detailed and do not offer consensus about its definition. There are authors who consider “agility” as an approach (Highsmith, 2004), as an attribute of practice (Schwaber, 2004), and others as a behavior (Qumer and Henderson-Sellers, 2008). They do not include a theoretical foundation for its correlation with practices, tools and techniques that originated in the APM theory. The definitions are incomplete, sometimes overlapping, and divergent as demonstrated in Sections 2 and 3 of this article.

These problems pose many challenges for empirical tests and cause an unnecessary multiplicity of constructs. Having a unique and clear “agility construct” definition will be helpful to identify how to measure it, which is an essential pillar for the construction of an agile project management theory. One key characteristic of a construct is having a clear and complete definition that allows other researchers to use in theory building as described by Suddaby (2010); Bacharach (1989); Christensen (2006) and Sutton and Staw (1995).

We consider that the APM theory is part of the whole project management body of knowledge, and should be developed considering the relationship with other PM knowledge areas. In the last decades, studies conducted by Shenhar and Dvir (1996); Shenhar et al. (1997); Shenhar et al. (2002) and Lechler and Dvir (2010) revealed that the type of the project as well as its environmental factors would impact the project’s performance. This corroborates with the need to understand the context where each practice performs better and to identify those fundamental performance measures.

This argument also applies to the importance of developing a common vision about the agility construct, its definition and how to measure it — which might be quite useful in all PM theory areas, beyond the current scope of APM practices or agile methods.

This paper focuses on the need of taking the first steps toward the definition of agility construct for the project management theory. Having a clear definition and understanding of the agility construct will help researchers uncover some key answers for these questions: (i) what is the criterion for classifying a management practice, tool or technique as “agile”? (ii) how do we know if an organization is in fact using an “agile practice, tool or technique”?; (iii) what practices, tools and techniques really contribute to greater agility?; and (iv) does greater agility in the project mean better performance of the project and the product? Therefore, it would be helpful to explore its relationship with practices from different approaches (e.g. agile, lean and design thinking), and/or other organizational factors.

This paper is relevant for both theory and practice since one of the first steps to uncover these questions lies in the understanding of the construct of “agility” under the project management perspective. Therefore, this paper (i) identifies and carries out a critical analysis of the definitions of agility, as they exist in the literature across multiple disciplines e.g., manufacturing,

organizations, product development, and software development. Next, (ii) we applied a technique named “frame semantics” (from the Linguistics field) to compare settings of definitions and to propose a more robust definition for the agility construct in the project management theory. Finally, the paper (iii) presents a preliminary empirical analysis of five variables proposed to measure the agility construct in the project management theory.

2. “Agility” as a construct for project management

The term “agility” was first observed in the area of manufacturing (Nagel and Dove, 1991), where it was disseminated as a concept called “agile manufacturing,” even before the term was popularized in the area of agile project management (or agile methods). The term “agile manufacturing” was treated as a new paradigm, characterized as “an ability to change the configuration of a system in response to unforeseen changes and unexpected market conditions (Goldman et al., 1995; Gunasekaran, 1999; Vokurka and Fliedner, 1998; Zhang and Sharifi, 2000).

The agility construct applied to manufacturing won supporters and was explored from different perspectives. One of these perspectives considered agility at the organizational and strategic level. In this case, the agility construct is addressed broadly, considering the entire organization (Goldman et al., 1995; Gunasekaran, 1999; Nagel and Dove, 1991; Sharifi and Zhang, 2001).

In the end of decade of 1980 and early 1990, agility appeared in the project management area, mainly illustrated in studies focused on software development projects (Eisenhardt and Tabrizi, 1995) and was underpinned by the development of the agile or lightweight methods (Schwaber, 2004; Poppendieck and Poppendieck, 2003; Cockburn, 2004; Palmer and Felsing, 2002; Highsmith, 2000; Stapleton, 1997; Beck, 1999).

One of the milestones for the dissemination of the term agility in this area was the Manifesto for Agile Software Development (Beck et al., 2001). Following this document, numerous publications adopted the term to describe the approach “agile project management” (Erickson et al., 2005; Cohn, 2005; Highsmith, 2004; Qumer and Henderson-Sellers, 2006). In parallel, scholars and practitioners have noticed similar principles and practices have been explored in other approaches such as Lean (Womack and Jones, 1996; Liker, 2004) and Design Thinking (Dorst, 2011; Brown, 2008, 2009; Razzouk and Shute, 2012).

The problem we identified with this literature, especially related to agile project management and project management as a broad theory is the lack of precision in defining and understanding the meaning of “agility”, causing different interpretations. One such interpretation is in terms of ability: the “ability to both create and respond to change in order to profit in a turbulent business environment” (Highsmith, 2004, p. 16); while others include to apply knowledge and experience to adapt to new environments, to react, and to seize unexpected opportunities (Boehm and Turner, 2004); and also, “the persistent behavior or ability of a sensitive entity that exhibits flexibility to accommodate, expected or unexpected changes rapidly...” (Qumer and Henderson-Sellers, 2006, p. 261).

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