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Project-conceptualisation in technological innovations: A knowledge-based perspective

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Abstract

Project management is widely regarded as a knowledge-based process. Critical to this process is the initial project-conceptualisation phase, especially in the context of technological innovations, but which has received little attention in the literature. Specifically, hardly any study has examined how project activities overlap, how project roles evolve, what skills are required and how much time is spent across different knowledge-based project-conceptualisation stages, or sets of activities. We explore these patterns and their knowledge-based explanations through a cross-case analysis of four technological innovations. Our contribution is a knowledge-based project-conceptualisation framework that deepens the appreciation of the evolving nature of the critical project management aspects across the highly uncertain project-conceptualisation phase. We then offer practical steps for project managers to effectively manage this project management phase.

Keywords: Project management; Knowledge; Technological innovations; Knowledge creation

1. Introduction

Project management is increasingly being recognised as a knowledge-based process where knowledge from different sources is combined to create value for the organisation (Desouza and Evaristo, 2006; Pemsel and Wiewiora, 2013). This resonates well with organisational knowledge creation, or the dynamic process of making available and amplifying knowledge created by individuals as well as crystallising and connecting it to an organisation's knowledge system (Nonaka and von Krogh, 2009: 635). Indeed, project management as a knowledge creation process is important to understand in the present-day knowledge era where the availability of information and knowledge is widespread.

Critical to project management is its front-end, project-conceptualisation phase, or the activities performed before the actual start of the project (Koen et al., 2001). This phase crystallises a new idea into a well-defined concept (Poskela and Martinsuo, 2009), and determines whether or not it merits further investments (Cristiano et al., 2000). However, this phase is troublesome because of its fuzzy and dynamic nature (Cooper, 2008; Murphy and Kumar, 1997) and, therefore, scholars persistently highlight the need to understand this phase in-depth (Oliveira and Rozenfled, 2010; Williams and Samset, 2010). Understanding this phase becomes even more important in the context of technological innovations because knowledge associated with technological innovations is often very complex to understand and master (Rothaermel and Deeds, 2004; Smith et al., 2005), making knowledge creation in technologically intensive projects extremely challenging (e.g. Bojica and Fuentes, 2012; Nieto and Santamaria, 2010). Thus project-conceptualisation phase in the context of technological innovations warrants an exclusive focus.

One way to understand the project-conceptualisation phase is to have an appreciation of how critical project management aspects, such as activities' overlaps, roles, skills and time, are patterned across the different project-conceptualisation stages,

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or sets of activities, and how these patterns relate to knowledge and its creation. However, as far as we are aware hardly any study has approached this phase with those research questions in mind. Thus, we know little about how different sets of project management activities overlap, how roles of project members evolve, what project skills are needed and how much time is typically spent across different project-conceptualisation stages, and how these patterns relate to knowledge and its creation. Understanding these patterns is important because different project-conceptualisation stages have different requirements (Koen et al., 2001), and a solid appreciation of these differences is imperative to manage the project-conceptualisation phase effectively and efficiently.

We explore the above mentioned patterns through a cross-case analysis of four technological innovations. The aim is to develop a project-conceptualisation framework that elucidates different patterns and their knowledge-based explanations that deepen managerial understanding for the effective management of the highly uncertain project-conceptualisation phase of the project management process. Henceforth, we first present concepts related to project management, followed by a review of the literature on project management as a knowledge-based process, identifying the gap that underlies our paper. We then present our research cases and methodology, followed by our findings. We conclude our paper by elaborating upon our contribution, before presenting limitations of our study and interesting future research directions.

2. Projects and their conceptualisation

Projects are temporary forms of cooperation and working constellations (Hanisch et al., 2009), and sites of innovations, comprising of ad hoc assemblage of participants from different disciplines (Love et al., 2005). They are different from the routine organisational processes because they are temporary, unique, lack organisational routines, have a short-term orientation (Lindner and Wald, 2011), but play an important part in integrating cross-disciplinary internal and external expertise (Love et al., 2005; Prencipe and Tell, 2001; Schindler and Eppler, 2003). They are also likely to be carried out beyond the hierarchical lines of authority, and, therefore, their effective management requires specific leadership skills (Ekstedt et al., 1999; Feeny and Willcocks, 1998). However, they are increasingly being regarded as regular forms of business processes rather than as exceptional cases and being applied to a range of vital operational or innovative activities (Leseure and Brookes, 2004; Winch, 2000).

Critical to project management is the front-end, project-conceptualisation phase, or the activities performed before the actual start of the project (Koen et al., 2001) until the project is crystallised into a well-defined concept (Poskela and Martinsuo, 2009), worthy of further investments (Cristiano et al., 2000). In terms of the traditional project management cycle, this phase would involve start-up (problem identification, possible solutions, setting objectives, and conceptual aspects agreed upon), definition (appraisal of solutions, analysis of risk, finance and benefits, and identification of scope of work) and planning (project broken down into manageable areas of work, such as time, costs, resources), stopping short of actual execution (Marks, 2012; see also Ideating–Charting–start-up phases of Kasvi et al., 2003). As highlighted earlier, what makes the project-conceptualisation phase important is that not only that it establishes the basis for further investments in the project by the organisation (Cristiano et al., 2000), but also that it is extremely challenging to manage due to its fuzzy and uncertain nature (Cooper, 2008; Murphy and Kumar, 1997), making it important to be understood in depth.

One way of understanding the project-conceptualisation phase is to focus on the critical project management aspect, that is, aspects that are critical to the successful completion of a project. While there are many critical aspects of the project management process, we wanted to delimit our focus and scope, and thus looked at the critical success factors that the extant knowledge identifies. Scholars have noted time, cost and quality as three critical success factors of project management (Gardiner and Stewart, 2000). While we treat time as a separate aspect because it represents the temporal dimension, it can be argued that cost and quality (as well as time) are also dependent upon how well the project is managed (Iqbal et al., 2011). The management of a project relies critically, among others, on how human skills (Pant and Baroudi, 2008) and project roles are allocated or contribute to the project. Moreover, projects are dynamic rather than static entities, with overlapping activities and processes (see Gardiner and Stewart, 2000). These overlaps could in turn shape the scheduling of different activities as well as the allocation of skills and roles, and are thus important to be understood. Following the above, we focus on four main aspects of project management — activities' overlaps, roles, skills and time, which are elaborated upon below:

a) *Activities' overlaps* are important because projects are time bound and schedule driven (Perminova et al., 2008) and their successful completion requires simultaneous performance of as many activities as possible (Laufer et al., 1996), especially those which are less inter-dependent and not part of a sequential chain, and, therefore, can be undertaken simultaneously. Activities that are sequentially interdependent also need to be scheduled, such as along the Critical Path, because any delay in one activity in the sequential chain could delay the whole project (Liu, 2010). It is important, therefore, to understand how different sets of activities overlap along the project-conceptualisation process.
b) *Roles* are important because projects as temporary and ad hoc assemblage of participants (Hanisch et al., 2009) require each manager and participant to have a clear understanding of their roles (Love et al., 2005) and when these roles come into play in the project. Any ambiguity in the demarcation of roles could lead to administrative confusion and might affect the smooth functioning of the project (Kirzner, 2009; Marks, 2012). It is important, therefore, to understand what types of roles become more important than others at different stages of the project-conceptualisation phase and how the roles of project members evolve along this phase.