

'Managing' Non-linear Projects

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It is increasingly recognized that innovation processes, especially in relation to the development of technologies that are radical or disruptive, do not follow the often-assumed linear progress – from basic science to applied research through development to commercialization. Instead, these kinds of innovation processes are better characterized as 'interactive' or 'networked' (Rothwell, 1994; Coombs et al, 2003). This recognizes that the locus of innovation resides in 'the network of inter-organizational relationships that sustain a fluid and evolving community' (Powell et al. 1996). Moreover, the notion of interactivity also recognizes that the temporal features of innovation cannot be predicted in advance because how the knowledge evolves is inherently indeterminate and political (Tsoukas, 1996, Swan and Scarbrough, 2005). Assumptions of space and time are, therefore, radically different in relation to interactive (as opposed to linear) innovation processes.

While the interactive nature of innovation processes and even projects is recognized in the academic literature, there has been less focus (academically or practically) on the implications for project management – yet this interactive innovation process is typically accomplished through project-based forms of organizing (Boland et al., 2007). There are two different aspects of project management that are important to consider in relation to interactive innovation processes. First, the interactive view, in contrast to the linear view, suggests that we cannot characterize innovation as a series of projects that are seamlessly passed from one phase to the next (see Newell et al., 2008). Frameworks for understanding this interactivity between projects themselves have been proposed (Desouza and Evaristo, 2004). Second, projects themselves will need to be managed differently and it is this aspect which we focus on in this paper. Thus, projects continue to be described as planned temporary endeavours that have a defined beginning and end, and that have pre-defined goals and objectives and associated deliverables that need to be met within a pre-agreed budget (PMBOK, 2004). In other words, projects are purposefully designed to be constrained by scope, time and budget. The assumption is, thus, that it is possible to plan all aspects of a project in advance and use these plans to control the project (Cavaleri and Reed, 2008; Townley, 2002).

The disconnect between such a view of project management and the notion of interactive innovation processes is very obvious. In this paper we will explore how our understanding of and approach to project management can be revised to accommodate interactive innovation processes. In doing this, we review emerging literature on complex projects that recognizes that conventional project management approaches do not suffice in the face of large, dynamic, non-linear and multi-stakeholder projects (Serman, 2002; Cicmil and Hodgson, 2006; Morris, 2004; Lawrence and Scanlan, 2007).

Our analysis of the relationship between interactive innovation and project management is based on a study of biomedical innovation which followed 9 therapeutic development projects over a 2 year period.

Four of the projects were based in the UK and five in the USA. Over the period of the study 141 interviews were conducted with key stakeholders in each project, supplemented by observation of meetings and document analysis. We use the data in this paper to describe and analyze the 9 projects in terms of their plans versus the realities on the scope, time and budget aspects of project management.

The first point to note from our analysis is that in each case, those involved were required to manage the project using the traditional scope, time and budget constraint protocol. However, it was also the case that in none of the projects were these pre-defined scope, time and budget predictions even vaguely related to what emerged in practice. Scopes changed as findings emerged that were not anticipated so requiring different activities; time-lines were constantly adjusted because activities took longer than anticipated or new activities had to be inserted; and budgets bore little resemblance to actual costs incurred. In the paper we will explore in detail the temporal and space issues that created the misalignment between the plans and the actual practices.

Our analysis of these projects leads us to a series of theoretical insights about the management of interactive innovation projects. Moreover, it also leads us to a set of recommendations about how interactive innovation projects can be more appropriately managed. In particular, we draw conclusions related to temporality (which requires us to rethink the timeline as well as the end point of a project) and project boundaries (which requires us to rethink the involvement of key players and stakeholders in a project).

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