Industrial Marketing Management xxx (2015) xxx–xxx

Contents lists available at ScienceDirect

Industrial Marketing Management

Opening the black box of the role of accounting practices in the fuzzy front-end of product innovation

Martin Carlsson-Wall, Kalle Kraus *

Stockholm School of Economics, Department of Accounting, Box 6501, SE-113 83 Stockholm, Sweden

ARTICLE INFO

Article history:
Received 9 November 2013
Received in revised form 22 August 2014
Accepted 26 August 2014
Available online xxxx

Keywords:
Accounting
Product innovation
Fuzzy front-end
Network bricolage
Mediating instrument

ABSTRACT

This paper has focused on the question "What is the role of accounting practices in the fuzzy front-end of product innovation?" Previous accounting research has primarily focused on the product development phase, neglecting the critical, early fuzzy front-end phase. Our findings, based on a case study of a producer of components to airplane engines, contribute to this literature by showing that keeping within the expenditure budget together with technical quantifications replaced the need for financial quantifications when the R&D department justified their work. Non-financial accounting practices thereby operated as a mediating instrument that mediated between the R&D department and internal and external actors regarding expectations about time and commercial potential. The study also contributes to the literature on product innovation in networks by detailing how accounting practices helped in making sure that the produce perspective was confronted with the use perspective and thereby secured attention to business aspects in the innovation process. In addition, accounting practices helped in constructing relatively coherent chains of trustworthy arguments necessary to mobilize support and resources from internal and external actors. Finally we contribute to the bricolage literature by detailing how accounting practices support network bricolage, and the importance of innovators being able to perform selective bricolage where bricolage is complemented with more confrontational behavior to move the innovation process forward.

1. Introduction

This paper deals with accounting practices[1] and product innovation. Product innovation has been put forward as highly critical for value creation on industrial markets in both the accounting (e.g., Bisbe & Otley, 2004; Davila & Wouters, 2004; Davila, Foster, & Oyon, 2009; Håkansson & Lind, 2004; Nixon, 1998) and marketing literatures (e.g., Clausen, 2014; Cooper & Kleinschmidt, 1987; Dubois & Araujo, 2006; Håkansson & Waluszewski, 2002; Rochford & Rudelius, 1997; Song, Neeley, & Zhao, 1996). However, even though product innovation has been extensively studied in marketing journals such as *Industrial Marketing Management*, there is little research on the role of accounting practices in product innovation (see Davila et al., 2009 for a recent review). One main reason for this is the large body of work that has highlighted the importance of intrinsic motivation and freedom in product innovation and therefore a need for minimal use of accounting practices and constraints (Abernethy & Brownell, 1997; Amabile, Conti, Coon, Lasenby, & Herron, 1996; Damanpour, 1991; Quinn, 1980; Verona, 1999). However, an emerging stream of research has demonstrated the enabling role of such practices for product innovation processes (e.g., Brown & Eisenhardt, 1997; Clark & Fujimoto, 1991; Håkansson & Lind, 2004; Jörgensen & Messner, 2010; Kamoche & Cunha, 2001; Mouritsen, Hansen, & Hansen, 2009; Zirger & Maidique, 1990). For example, Håkansson and Lind (2004) showed how accounting metrics were important in coordinating inter-organizational product innovation while Jörgensen and Messner (2009, 2010) demonstrated how spreadsheet models with contribution margin ratio and payback ratio were important ways to coordinate the product development process within a company.

Our paper differs from previous work in that we specifically focus on the early phase of product innovation, hereafter referred to as the fuzzy front-end. This is important because previous accounting research (Jörgensen & Messner, 2010; Mouritsen et al., 2009) has focused on the product development phase, neglecting the critical early fuzzy front-end phase which the product-innovation literature has demonstrated

* Corresponding author. Tel.: +46 8 736 9308.
E-mail addresses: Martin.carlsson@hhs.se (M. Carlsson-Wall), kalle.kraus@hhs.se (K. Kraus).

[1] In line with Davila et al. (2009), we define accounting practices following Simons' definition: "formal, information-based routines and procedures managers use to maintain or alter patterns in organizational activities" (Simons, 1995, p. 5). As noted by Davila et al. (2009, p. 323), because we study accounting practices in the specific process of product innovation, such practices speak to the systems that are used within this process, for instance R&D expenditure budgets, financial quantifications in the form of payback ratio and contribution margin, but also non-financial accounting practices such as stage-gate models and innovation policies (see also, Jörgensen and Messner (2009) for a similar definition). This follows Davila (2000), who emphasized that researching the role of accounting practices in product innovation cannot be restricted to financial accounting practices, but needs to also encompass non-financial accounting practices and controls.

http://dx.doi.org/10.1016/j.indmarman.2015.01.007
0019-8501/

as decisive to product innovation success (Alam, 2006; Frishammar, Lichtenthaler, & Richnér, 2013). The fuzzy front-end is defined as "the period between when an opportunity is first considered and when an idea is judged ready for [product] development" (Kim & Wilemon, 2002, p. 270). This means that this early phase of product innovation is much less routine, more dynamic and uncertain compared to the new product development phase (Davila et al., 2009). The research question driving our exploratory study is: "*What is the role of accounting practices in the fuzzy front-end of product innovation?*"

Due to the high degree of uncertainty and ambiguity in the fuzzy front-end, we can expect clear limits to the usefulness of financial accounting practices there, for the optimal relationship between costs and activity levels is typically not known, or even knowable (Rockness & Shields, 1984). Nevertheless, there may be a need for *some* form of accounting practices in such a case because decisions need to be made and actions must be coordinated (see, Jörgensen & Messner, 2010). As noted by Davila et al. (2009, p. 285–286), there remains a worrying lack of knowledge on the role of accounting practices in the fuzzy front-end of product innovation: "The 'black box' management approach — where the only formal control mechanism is to fund/not-fund innovation departments and managers can just hope that clan control will lead to relevant outputs [in the current state of knowledge about the role of accounting in the fuzzy front-end of product innovation]". This paper, based on a case study of AirComp, a producer of components to airplane engines, seeks to open up this 'black box'. The paper is organized as follows: The next section reviews the literature on accounting and product innovation and thereafter discusses the theoretical underpinnings of the study. After this, the research methods are presented, followed by the case analysis. Finally, the paper ends with conclusions and suggestions for future research.

2. Theoretical development

2.1. Accounting practices and product innovation: previous research

As noted by Van de Ven, Polley, Garud, and Venkataraman (1999), it is difficult to grasp the process of product innovation as it is often not linear and it cannot be managed in traditional ways. They concluded (p. 10): "When innovation development work begins, the process does not unfold in a simple linear sequence of stages and sub-stages. Instead, it proliferates into complex bundles of innovation ideas and divergent paths of activities by different organizational units. Specifically, after the onset of a simple unitary progression of activity to develop an innovative idea, the process diverges into multiple, parallel, and interdependent paths of activities." Relatedly, a large body of literature has seen accounting practices as obstacles to creativity and incapable of supporting product innovation (e.g., Abernethy & Lillis, 1995; Amabile, 1998; Tushman & O'Reilly, 1997). Such practices risk undermining the intrinsic motivation needed for effective performance of highly uncertain tasks and this body of work advocated the use of informal controls in product innovation processes (Adler & Chen, 2011). Tushman and O'Reilly (1997, p. 108) summarize this stream of research: "… control systems cannot be static and formal. Rather, control must come in the form of social control systems that allow directed autonomy and rely on the judgment of employees informed by clarity about vision and objectives of the business." Hoholm (2009), for instance, found when investigating the development of the blue-green innovation strategy that the two routes were: the financial with more focus on accounting practices, and the industrial. As he concluded (p. 86): "the former [the financial route] had a short career."

However, recent research proposes that accounting practices enable innovation, often related to an expanded definition of accounting practices to not only encompass financial measures (Adler & Chen, 2011; Clark & Fujimoto, 1991; Davila, 2000; Håkansson et al., 2010; Kamoche & Cunha, 2001; Tatikonda & Rosenthal, 2000). In the accounting literature, leading researchers even talk about a paradigm shift. As Adler and Chen put it (2011, p. 63): "indeed, recent theoretical and empirical research in management accounting and control represents a paradigm shift away from the traditional focus on established objectives and stable environments…. The new paradigm highlights the role of management control systems in innovation and uncertain environments, envisioning formal management control systems as 'flexible and dynamic frames adapting and evolving to the unpredictability of innovation, but stable to frame cognitive models, communication patterns, and actions' (Davila et al., 2009, p. 327)." Studying Intel, Miller and O'Leary (2007) showed how non-financial accounting practices in the form of a technology road map functioned as a 'mediating instrument', i.e., an instrument connecting two domains, in their case mediating between Intel and other firms and agencies by envisioning a future and describing the direction and timing of the necessary innovation investments needed. Carlsson-Wall, Kraus, and Lind (2009), studying the development of industrial robots, found that target costing influenced many of the pragmatic decisions concerning technical and organizational interfaces in distributed product development processes. These two studies, together with studies by Cooper and Slagmulder (2004), Håkansson and Lind (2004), Mouritsen, Hansen, and Hansen (2001), Mouritsen et al. (2009) and Revellino and Mouritsen (2009) have been important for increasing our knowledge of how accounting practices mediate between an innovation and its environment and of the important role that inter-organizational accounting plays in product innovation.

There are also studies that describe the role of accounting practices in specific product development projects within a company (Jörgensen & Messner, 2009, 2010; Nixon, 1998). For example, studying the development of a new copper rod production machine, Nixon (1998) found that financial accounting practices could integrate disparate knowledge perspectives. This enabling role arose because in order to reach accounting targets, project participants had to engage in a detailed examination of every component and then negotiate and reach a consensus around the best possible solution. Similarly, Jörgensen and Messner (2009, 2010), demonstrated how accounting practices in the form of stage-gate models and financial calculations were important in the product development phase. More specifically, accounting practices enabled project managers to keep track of costs locally and share this information with engineers and designers during the stages. In addition, the stage-gate model created a formal structure of accountability, which reminded project managers and engineers of the importance of profitability.

To summarize, there is a large body of literature that views accounting practices as obstacles to creativity and incapable of supporting product innovation. However, there is also an emerging literature that has offered rich case descriptions of the enabling role of accounting practices in product innovation. As noted in the Introduction, these studies have mainly focused on the later phase of the product innovation process (i.e., new product development) which means that there is a worrying lack of knowledge on what it actually means to practice accounting in the uncertain fuzzy front-end of product innovation. In the next section, we therefore discuss the characteristic of the fuzzy front-end and provide a tentative discussion of the implications for the role of accounting practices in this phase of product innovation.

2.2. Accounting practices and the fuzzy front-end of product innovation — the importance of network bricolage

The fuzzy front-end starts with the surfacing of an idea for innovation, and it ends with a decision to either approve or disapprove a formal product development project (Frishammar et al.,

Please cite this article as: Carlsson-Wall, M., & Kraus, K., Opening the black box of the role of accounting practices in the fuzzy front-end of product innovation, *Industrial Marketing Management* (2015), http://dx.doi.org/10.1016/j.indmarman.2015.01.007