



Creativity, trust and systematic processes in product development

Anna Brattström^{a,*}, Hans Löfsten^b, Anders Richtner^a

^a Center for Innovation and Operations Management, Department of Management and Organization, Stockholm School of Economics, Box 6501, SE 113 83 Stockholm, Sweden

^b Division of Operations Management, Department of Technology Management and Economics, Chalmers University of Technology, SE 412 96 Göteborg, Sweden

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ABSTRACT

This paper addresses the challenge of striking a balance between, on one hand, mitigating uncertainty through the existence of systematic processes and structures and, on the other, stimulating creativity through allowable variation in work processes and structures. Both objectives are fundamental aspects of product development work. Our main finding is that both objectives can be achieved simultaneously. We introduce trust as a mediating variable. We show first, that being systematic in the processes for obtaining information and applying explicit organizational rules and structures in product development work creates an atmosphere of trust in the organization. Second, we show that trust increases creativity. The paper contributes to an understanding of how and why trust is important in product development organizations and of how trust can be actively managed. Above all, the paper contributes to the understanding of how uncertainty and creativity should be managed in organizations conducting product development.

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1. Introduction

This paper addresses the balance between mitigating uncertainty and stimulating creativity in product development. Facing the inherent uncertainty in product development work (e.g., Stockstrom and Herstatt, 2008), firms are advised on one hand to decrease variation through systematized processes and structures (e.g., Cooper, 1992) and on the other, they are also advised to increase variation in processes and structures in order to stimulate creativity in product development work (Amabile et al., 1996). Both systematized processes and structures (e.g., Cooper, 1992), and creativity (e.g., Bassett-Jones, 2005) are central aspects of innovation. Achieving both requires balance, as expressed by Clark and Fujimoto (1991, p. 161) “The challenge in product development is not so much unilateral pursuit of organic structure and permissive management style as a subtle balance of control and freedom, precision and flexibility, individualism and teamwork”.

At its most general level, this paper argues that there is no inherent tradeoff between being systematic with processes and structures while also stimulating creativity in product development work. More specifically, the paper shows that the process for obtaining information can be systematic and organizational rules and structures can be explicit – while the climate in the organization remains nevertheless creative. The compatibility of these

apparent contraries lies in how *trust* is achieved and managed within organizations.

Previous research has modeled trust as an outcome of predictability (e.g., Lewicki and Bunker, 1996), i.e., when the actions of organizational members are perceived as predictable, trust will increase. Systematic processes and structures exist in order to decrease variation and thereby increase predictability. We argue, therefore, that systematic processes and structures will foster trust in an organization.

Previous research has identified trust as an important element in product development because it enhances learning and stimulates creativity (Barczak et al., 2010). This paper therefore explores the following research question: *can trust function as a mediating variable that, enables firms to combine systematic processes and structure with creativity?* We propose and then test the proposition that when goodwill trust is high in an organization, product development activity can benefit from being systematic in processes and structures without crowding out creativity.

In doing so, this paper makes four key contributions. First, we show that trust can emerge beyond the simply the scope of individual interaction. More specifically, our study describes how systematic processes and structures contribute to predictability in an organization and thereby foster trust. Second, we show how trust can be actively managed within an organization. We are able to do so by translating the abstract notion of predictable behaviors into the tangible notion of systematic processes and structures. Because processes and structures are the result of active management, the results of this paper imply that trust can also be actively managed. Third, we analyze trust in two dimensions – goodwill

* Corresponding author. Tel.: +46 733 86 79 49; fax: +46 8 31 81 86.

E-mail addresses: anna.brattstrom@hhs.se (A. Brattström), hans.lofsten@chalmers.se (H. Löfsten), anders.richtner@hhs.se (A. Richtner).

trust and competence trust. We argue that whereas goodwill trust and creativity are closely related, competence trust does not necessarily stimulate creativity. This finding complements earlier studies arguing for a relationship between trust and creativity (Bidault and Castello, 2009, 2010; Chen et al., 2008). Fourth, by introducing trust as a mediating variable, we find that being systematic in processes and structures does not necessarily crowd out creativity. Thereby, we elaborate on previous theoretical suggestions (Feldman and Pentland, 2003; Gilson et al., 2005) that systematized rules and routines can result in creativity.

First – in Section 2 – we outline a conceptual framework that defines the role of trust as a mediating link between being systematic and being creative. In Section 3, we describe and justify the sample and data collection process and the constructs and measures of investigation. In Section 4, we account for the analytical processes applied and for results. Finally, in Section 5, we discuss our findings and their implications for research and practice as well as their limitations.

2. Theoretical background and hypotheses

2.1. The supposed tradeoff between systematic processes and structures and creativity

Organizations need both to explore new knowledge and to exploit existing knowledge in order to create both radical and incremental innovation (e.g., Benner and Tushman, 2003; March, 1991). Incremental innovations are exploitative (products designed to meet customers' existing needs), and radical innovations are explorative (meet the needs of emerging customers). In most organizations product development work includes elements of both exploration and exploitation, yet the mutual pursuit of these two forms of innovation remains a central challenge.

Adding to this challenge is the inherent uncertainty in product development because for each new product the organization faces new problems that require novel information and imaginative problem-solving. In this paper, *uncertainty* is defined as *the difference between the amount of information required to perform a task and the amount of information already possessed by the organization* (Galbraith, 1973, p. 5). The three types of uncertainty (or in Galbraith's terms information gaps) relevant to product development are commonly referred to: market-related uncertainty; technology-related uncertainty and project scope (Davila, 2000). These types of uncertainty affect both the outcome and the process of product development.

Because the effects of uncertainty are potentially significant to product development, a good deal of research provides advice on mitigating uncertainty. When conditions are uncertain, firms are advised to systematize their methods for obtaining information (Arora and Gambardella, 1994; Davila, 2000; Holt, 1978; Horsmans, 1979). A systematic (as opposed to trial-and-error) process for gathering information about customer needs or technological advancements makes it easier to overcome the information gaps that Galbraith refers to. In addition, firms are advised to form explicit organizational rules and structures in order to moderate uncertainty. This line of argument can be traced back to the works by Robert Cooper (e.g., 1992) that led to the development of 'phase-gate' processes that many firms have subsequently adopted.

The process for developing a new product is less vague in an organization where employees know how to interact and with whom to interact. Taken together, systematized (as opposed to trial-and-error) processes and explicit organizational rules and structures detail how and by whom work should be performed. Their goals are to reduce the variance associated with the task (Gilson et al., 2005; March, 1991) and thereby make operations

more consistent and the product development process less uncertain.

Product development also calls for creative thinking (Amabile et al., 1996; Heinze et al., 2009; Iwamura and Jog, 1991). Amabile (1998) and Amabile and Conti (1999) argue that freedom in processes increases intrinsic motivation and helps employees make the most of their skills. Individuals who rely on well-known routines and rigid organizational rules and structures become less willing or able to try out new ideas – thus hampering creativity. Therefore, in order to be able to stimulate creativity, defined as the production of novel and useful ideas (Amabile et al., 1996), firms are advised to *enhance variation to optimize the fit between team efforts and outcomes* (Gilson et al., 2005, p. 523).

Mitigating uncertainty and stimulating creativity is consequently described in the literature as a balancing act. Systematized processes have been linked to the concept of exploitation and incremental innovation, as expressed by March's (1991): "exploitation includes such things as refinement [. . .] efficiency, selection, implementation, execution." Freedom in processes, on the other hand, has been linked to creativity, exploration and radical innovation. The purpose of this paper is to complicate and nuance the apparent tradeoff between having systematic processes and structures versus creativity. This we do by explicitly attending to the concept of trust. The main question we address is (1) can trust function as a mediating variable, thus enabling firms to combine systematic processes and structures with creativity? In order to answer this question, we will first address the role trust plays in product development, and we do so by answering the following two questions: (2) can systematic processes and structures foster a climate of trust in organizations? And (3) is there a link between goodwill trust and creativity in organizations? These questions are addressed from Sections 2.2 to 2.5.

2.2. The role of trust in product development settings

Following previous literature, we define trust as a psychological state comprising the intention to accept vulnerability based upon positive expectations of the intentions or behavior of another (Rousseau et al., 1998). To trust is to make a leap of faith, to expect others to honor rather than betray trust. Trust, thereby, does not reduce risk per se in a situation, but reduces the perceived level of risk (Das and Teng, 2001).

Trust is a multidimensional construct. In one dimension trust can exist between two individuals, within groups of individuals, within a single organization and between organizations. The focus of this paper is the level of trust within a product development project conducted within a single firm. In a second dimension, trust can be of different qualitative types (Dietz and Hartog, 2006). In a well-cited framework, McAllister (1995) distinguishes between cognition-based trust and affect-based trust. Cognition-based trust is grounded in available knowledge and "good reasons". Cognition-based trust, thereby, is closely related to responsibility, reliability, competence and dependability. Moreover it also evolves over time as the trustor confirms the expectations of the trustee. Affect-based trust, on the other hand, is grounded in emotional bonds between individuals. Such trust is based on a genuine concern for the other party, a belief in the inherent value of a relationship.

A third dimension of trust concerns the content of the trust (Dietz and Hartog, 2006). In this paper, we follow the line of Sako (1992) and Das and Teng (2001) and focus specifically on this dimension by addressing the difference between competence trust versus goodwill trust. Competence trust is defined as *trust that the other party is capable to do what he or she promises* and is also referred to as ability (Mayer et al., 1995). Goodwill trust is defined as *trust in the moral integrity of the other party* (Ring and Van De Ven, 1994), and it also denotes the extent to which a partner is genuinely

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