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Managing Uncertainty and Equivocality: The Role of Heavyweight Manager and Customer involvement

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ABSTRACT

In turbulent market environment, two practical challenges are the lack of understanding of precise customer requirements and misunderstanding on complexity of dynamic environments. We examine the role of heavyweight manager and customer involvement on improving NPD project performance with a general research model that defines key practices that are essential in managing uncertainty and equivocality of project environments. We further examine four different models to assess how project team determine shared team purpose and mission in achieving project time reduction and customer satisfaction. Based on 202 project team results, we report the findings and discuss practical and theoretical implications.

KEYWORDS: Uncertainty, Equivocality, Front-end planning practices, Shared team purpose, Heavyweight manager, Project performance, Empirical study

INTRODUCTION

In the increasingly dynamic, turbulent and complex market environments, the nature of information becomes quite equivocal (i.e., available ample information that is subject to multiple different information) and uncertain (i.e., challenging to make decisions because of lack of timely and relevant information). In the time-based completion, such information needs present serious challenges for project management (Eriksson, 2016; Sakka et al., 2016 Sjödin et al., 2016; Youn et al., 2014). This article is an extension of previous work on front-end planning practices by (1) Koufteros et al.(2002), Hong et al. (2004, 2005, 2011), Rauniar et al. (20008a, 2008b) , Doll et al., (2010). This is different from previous research in several ways: (1) The data set is different in terms of respondents and time period; (2) this paper examines both certainty and equivocality; (3) we examine the role of heavyweight manager and customer involvement in improving project performance through strategic fit and shared purpose.

LITERATURE REVIEW

There have been several articles that examine the frontend processing in terms of clarity of project targets (Hong et al., 2004), role changes of design engineers (Hong et al., 2005), role of heavyweight manager (Rauniar et al., 2008a), improving product development glitches (Rauninar 2008b), shared knowledge of customers, suppliers and international capabilities on

NPD performance (Doll et al., 2010), and strategic fit as an important linkage mechanism for NPD performance (Hong et al., 2011; Roh et al., 2014). These series of paper discuss briefly on the importance of managing uncertainty and equivocality of information. However, empirical examination of both of these two information characteristics are not available.

Fuzzy Front-end Planning Practices: Heavyweight Manager and Customer Involvement

The appointment of a heavyweight manager is defined as "the practice of appointing a senior executive to champion and direct product development efforts who has substantial expertise, informal influence, and formal decision making authority" (Clark and Fujimoto, 1991; Brown and Eisenhardt, 1995; Antonioni, 1996; Walsh, 1995). Heavyweight managers have the capability to solve the issues of uncertainty and equivocality in product development projects (Koufteros et al, 2002; Sarin and O'Connor, 2009; Zahra and George, 2002). Through direct and effective contact with the market, customers, and engineers, heavyweight managers can solve the problems that a lack of information in a product development project bring (Clark and Fujimoto, 1991; McDonough III, 1993; Rauniar et al., 2008).

Improvement of Information Quality: Uncertainty and Equivocality

Uncertainty is defined as the lack of information that the organization needs or "the difference between information possessed and information required to a complete a task" (Tushman and Nadler, 1978). Uncertainty or "lack of information" requires product development team members to think about the boundary of their tasks and the characteristics of their work, and to be ready to have enough knowledge on necessary organizational routines (Becker, 2005).

Thus, uncertainty enables team members to possess the cognitive and practical motives to use integrative practices (the instruments to provide the necessary information) in a timely manner (Cunha et al., 1999; Epstein et al., 1996; Escalas, 2004; Levinthal and Warglien, 1999). Equivocality means ambiguity, or, in other words, the existence of multiple and conflicting interpretations about an organizational situation (Daft and Weick, 1984; Daft and Lengel, 1986).

The existing literature has not addressed the external environment as a source of equivocality. The business environment is unanalyzable (there is an unclear cause and effect) because, in the market, there are many signs about competitors (Porter, 1980). Much information is available, but interpreting such information is difficult (Lenz and Engledow, 1986; Lieberman and Asaba, 2006). Even in cases where the market size is small, there can be many impacting factors which are hard to anticipate in advance (Loch et al., 2008). The market may be new, growing or dying but there is some chance for technology to change the market environment.

Shared Team Purpose and Mission

Through team vision, team learning is shared and transferred across the functions of a team (Takeuchi and Nonaka, 1986; Daft and Weick, 1984; Youn, 2012)). Team vision helps team members mutually understand the realities of the market and strategic initiatives and it also minimizes the conflicts between members (Lynn and Akgün, 2001, 1998; Pinto et al., 1993). Shared team purpose refers to the entire team's understanding and acceptance of the project's mission (Hong, 2000; Cramton, 2001). Shared team purpose helps team members to define the scope of their project (Rosenthal, 1992) and to understand the product development goals (Rosenthal and Tatikonda, 1992; Bstieler, 2006).

Product Development Process Outcomes: Time to Market Reduction and Customer Satisfaction

Product development outcomes are defined as "performance measurements of IPD in terms of process outcomes and product outcomes" (Hong 2000, Hong et al., 2004, 2005; Rauniar, 2005). Reducing product development time while maintaining good product quality is one of the key success factors in the market (Gupta and Wilemon, 1990; Hong, 2000; MacCormack and Verganti, 2003; Rawsky, 2005).

Customer satisfaction refers to "the satisfaction of the customer for the product designed in a certain target market" (Cooper and Kleinschmidt, 1996; Syamil, 2000; Rawsky, 2006). Customer satisfaction is an effective tool in attracting new customers, in verifying the quality of products and in confirming created customer values (Clark and Fujimoto, 1991; Porter, 1985; Syamil, 2000).

RESEARCH MODEL

Theoretical Background

Information processing theory emphasize the inflow of information from outside of organization. Under this theory the role of product development team can be viewed as to obtain the data and information externally. In contrast, knowledge management is about the generation of useful knowledge from the inside of organization (Nonaka, 1994). Product teams try to realize solid and concrete product artifacts by reinterpreting the tacit knowledge that shared or suggested by team members who play the expanding boundary roles. With the leadership of team leader, product development team could be successful in their efforts to realize shared vision on products they are developing. These two theories explain well the certain aspects of product development process.

Figure 1: Front-end Planning Practices, Information Quality, Shared Team Purpose and Development Process Outcomes

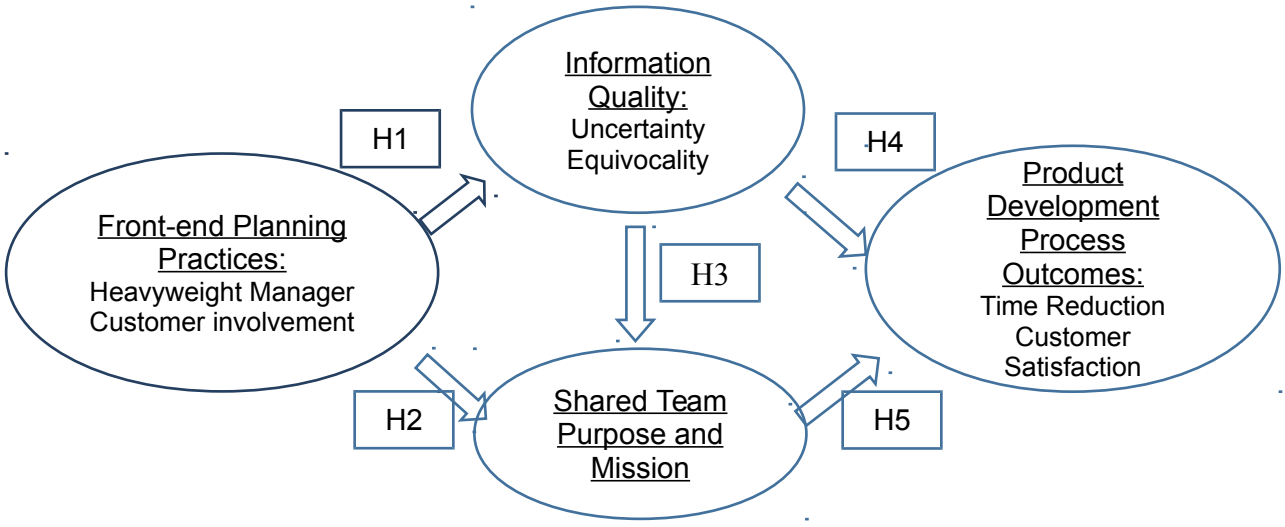


Figure 1 shows our theoretical model that explains the relationships between fuzzy-front end planning practices (i.e., heavyweight manager, customer involvement), improved information

quality (i.e., uncertainty and equivocality), shared team purpose and mission, and product development process outcomes (i.e., time to market reduction and customer satisfaction). Customer involvement belongs to information gathering routines. Heavyweight managers gather information and generate knowledge that their team require. With customers and heavyweight manager's active participation in the process, the needed information is suggested, which could be led to team vision if the information is well accepted by team members.

Hypotheses Development

According to Daft and Lengel, it is the roles of integrative practices that make an organization cope with this uncertainty and equivocality. For instance, in the product development process, firms adopt integrating mechanisms to help cope with environmental uncertainty (Ketokivi and Schroeder, 2004; Gupta et al., 1986; Rajagopalan and Spreitzer, 1996). As project teams (a) know what they are supposed to know but do not know the details (i.e., uncertainty) and (b) do not know what they need to know (equivocality), then the team makes an effort to solve these problems internally and externally. The product development teams depend on strategic, organizational, and technical mechanisms to gather and clarify information about the nature of the project, purpose, goals, and direction. In spite of the limitation of the use and restoration of resources within organizations, a high degree of uncertainty brings a wide use of organizational practices (Milgrom and Roberts, 1988; Miller, 1991). Thus, this research develops the following hypotheses:

H1: The greater level of front end planning practices, the greater level of improvement of information quality.

Front-end planning activities have a major information processing capability as they translate the languages of different “occupational communities” into a common understanding (Bechky, 2003; Boland and Tenkasi, 1995; Szulanski, 1996). They control the level of information, defining uncertainty and equivocality (Daft and Lengel, 1986; Gersick and Hackman, 1990). Through routines, the project team comes to know what they are supposed to know (to solve uncertainty) and (b) know what they need to know (to solve equivocality), to have a common and updated understanding about the project nature, purpose, goals, and direction (Bettenhausen and Murnighan, 1985; Eisenhardt and Tabrizi, 1995; Ethiraj and Levinthal, 2004).Thus, this study hypothesizes:

H2: The greater level of front end planning practices, the greater level of Shared team purpose and mission.

High levels of uncertainty and equivocality will make it more difficult for the project team to enact a shared interpretation (Ettlie and Subramaniam, 2004). As project teams (a) know what they are supposed to know but do not know the details (i.e., uncertainty) and (b) do not know what they need to know (equivocality), then team does not have any shared understanding about the project’s nature, purpose, goals, and direction. In other words, an unstable task environment might often change product strategies, which result in difficulties in sharing understanding among team members (Karlsson and Ahlstrom, 1997; Pinto et al., 1993). Therefore, the project team may not have a shared team vision. Thus, the following hypothesis is derived from the discussions:

H3: The greater level of improvement of information quality, the greater level of Shared team purpose and mission.

Through front-end planning practices, as project teams improve the level of uncertainty and equivocality. the lesser the information processing burden. Where the firm process enough information, the result would avoid project delays or failure. As project teams (a) know what they are supposed to know in adequate details (i.e., uncertainty reduction) and (b) know what they need to know (equivocality), then the whole process is operating in the informed environment, the outcomes of the product development teams may be better (Pagell and Krause, 2004; Frishammar et al., 2011). Thus, the following hypothesis is derived from the discussions:

H4: The greater level of improvement of information quality, the greater level of product development process outcomes.

There is strong theoretical support in the organizational behavioral literature for a relationship between team vision and product development success. Team vision involves goal setting and the positive effects of goal setting on performance are well established (Naylor and Ligen, 1984; Latham and Locke, 1979; Gaglio and Katz, 2001; Gaglio, 2004). Hoopes and Postrel (1999) maintain that shared knowledge enhances the success of product development projects; it reduces glitches. As project teams know what they are supposed to know, then the information flows in the whole product development processes are quick and flexible, resulting in a flexible manufacturing process and successful outcomes for the product development teams (Bahrami, 1992; Boisot, 1998; Koufters, 1999; Lam, 1996). Team vision has elements of both goal setting and shared knowledge (Nielson, 2006; Niezen and Weller, 2006). Thus, this research proposes the following hypothesis:

H5: The greater level of shared team purpose and mission, the greater level of product development process outcomes.

RESEARCH METHODS

Since unit of analysis is the product development team, the respondents were product development managers, or those who were involved in cross-functional product development projects. The respondents were asked to answer the questions based upon their perceptions of a recently completed project regardless of the project's success. The responses are based on the respondent's actual experience on a completed project where they can judge PP or the antecedent variables in the context of the project experience or the competitive market place consequences (i.e. competition).

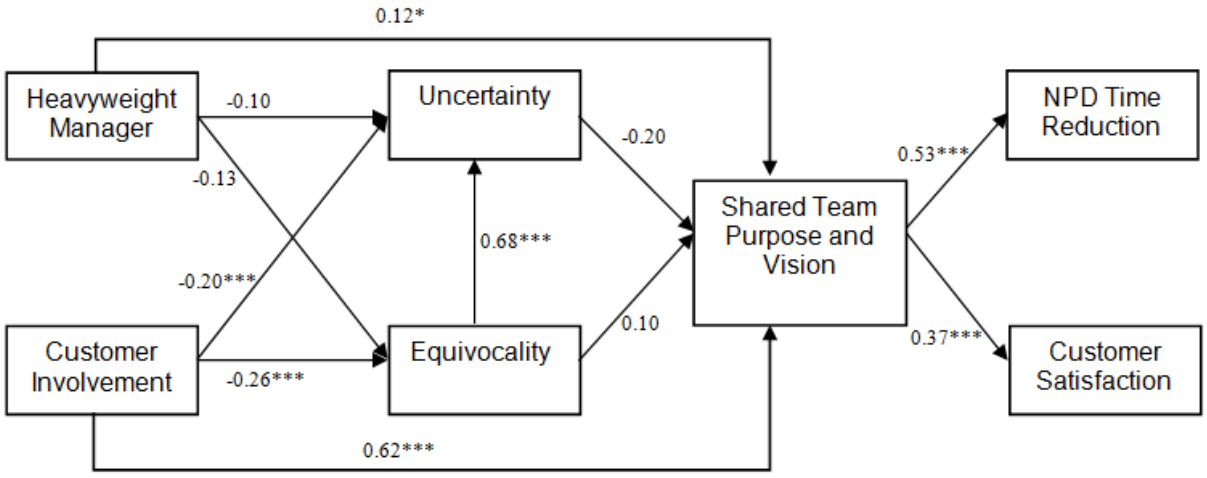
RESEARCH RESULTS

In addition to the five hypotheses, we also tested the relationship between Uncertainty and Equivocality and found that Equivocality significantly increases Uncertainty. All three models supported this relationship. This shows that by improving Equivocality, a firm can improve Uncertainty. To examine different team dynamics we examined four different models of how heavyweight managers (HW) and customer involvement (CI) interact with information quality (i.e., uncertainty and equivocality), shared team purpose and mission to achieve desirable performance outcomes.

Figure 2 assumes that both Heavyweight managers and Customer involvement impact both Information Quality (i.e. uncertainty and equivocality) and Shared Team Purpose and Mission.

Both HW and CI impact on information quality and shared team purpose and mission. In this case information quality does not have statistically significant impact on shared team purpose and mission.

Figure 2: Model 1-- Active Roles of Heavyweight and Customer Involvement



* p-value < 0.10; ** p-value < 0.05; *** p-value < 0.01

CONCLUSION

The main idea is about the roles of heavyweight managers (HW) and customer involvement (CI). If primary roles of HW and CI are to improve information quality in terms of reduction of uncertainty and equivocality, then the project team is empowered enough to work on the formation of shared team purpose and mission on their own. However, both HW and CI are continually influence the nature of shared team purpose and mission of team, then the shared team purpose and mission are heavily influenced by HW and CI activities rather than quality of information.

Future studies may examine further how project team really work. In the increasingly information intense environment, both heavyweight manager and customer involvement is important in fuzzy frontend planning. However, this study shows that improved information quality without continuous involvement of HW and CI result in similar level of quality work as HW and CI continually involved on team's work processes. As project teams develop their new projects and services based on dynamic and rapidly changing market environments, the nature of fuzzy front end planning practices and the role of information quality deserve continues fruitful research attention.

REFERENCES

References available upon request.