



High commitment work system, transactive memory system, and new product performance [☆]

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ABSTRACT

Although scholars find that the transactive memory systems can improve new product performance, few studies have empirically examined how managers can induce a transactive memory system in new product development teams with a set of systematic management practices. Based on the theoretical argument about human resource system in the strategic human resource management literature, this study proposes that implementing a set of coherent human resource management practices with workers in new product development teams can induce a transactive memory system in the team. Following previous scholars, this study calls this set of coherent human resource management practices as the high commitment work system. With survey data collected from 336 new product development engineers of 73 new product development teams in 73 firms, this study finds that transactive memory system mediates the positive relationship between the high commitment work system implemented with workers in new product development teams and new product performance.

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1. Introduction

Past research finds that innovation and new product (NP) performance are crucial for firm success (Gupta & Woodside, 2006; Gupta, Woodside, & Dubelaar, 2009; Tseng & Wu, 2007; Wu, 2007, 2010; Wu & Wang, 2007). A team process found conducive to new product performance is the transactive memory system (TMS) (Akgun, Byrne, Keskin and Lynn, 2006; Akgun, Byrne, Keskin, Lynn and Imamoglu, 2005). Transactive memory (TM) involves two components: (1) a set of organized knowledge contained in the individual memory of team members, and (2) a set of transactive processes that occur among team members (Wegner, Giuliano, & Hertel, 1985). The transactive memory system (TMS) refers to a set of individual memory systems in combination with the communication that takes place between individuals (Wegner, 1986). As such, TMS refers to a shared system that people in relationships develop for encoding, storing, and retrieving information about different substantive domains (Hollingshead, 1998). TMS exists when team members actively use their transactive memories to draw on and combine others' knowledge to perform a joint task (Lewis, 2003, p. 588).

Much research has examined TM, TMS, and TMS' beneficial effect on performance (Peltokorpi, 2004, 2008, 2012; Peltokorpi & Manka, 2008; Rau, 2005, 2006; Ren & Argote, 2011). One line of investigation in the TMS research examines how TMS can promote NP success (Akgun, Byrne, Keskin, & Lynn, 2006; Akgun et al., 2005; Dayan & Elbanna, 2011). Although scholars have verified TMS' beneficial effect with NP performance (Akgun, Byrne, Keskin, Lynn, & Imamoglu, 2005; Akgun et al., 2006), comparatively fewer studies have empirically demonstrated how managers can bring about a TMS in new product development (NPD) teams to promote NP success.

This study complements the research into TMS and NP performance by investigating how managers can implement a set of coherent human resource (HR) management practices with workers in NPD teams to develop a TMS in the team in enhancing NP performance. Following previous scholars (Collins & Smith, 2006), this study calls this set of interrelated HR practices the high commitment work system (HCWS).

This study draws on the HR system theory (Lepak, Liao, Chung, & Harden, 2006) in the strategic human resource management literature to develop hypotheses on the relationship between HCWS and TMS. The HR system theory argues that implementing HCWS with employees can nurture workers' abilities to perform, provide workers with the opportunities to perform, and adequately motivate workers to perform according to the company's objectives (Lepak et al., 2006, p. 231). The HR system theory also argues that HR practices first affect individual worker's behaviors and then aggregates into better performance of the collective (Lepak et al., 2006, p. 231).

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Based on the HR system theory, this study proposes that implementing HCWS with NPD personnel in NPD teams can nurture workers' specialized knowledge, help them know of the specialized knowledge of their teammates, and motivate them to utilize the knowledge of their teammates to accomplish the team assignments. Since TMS exists when team members actively use their transactive memories in combination with others' knowledge to perform a joint task (Lewis, 2003, p. 588), this study argues that implementing HCWS with workers in NPD teams can nurture a TMS in the team to help the team attain the NP's developmental goals.

To empirically examine the authors' propositions, this study surveys NPD team members in Taiwanese electronic product manufacturing companies. These Taiwanese firms face keen competition in their operating environment so they often assemble cross functional teams to develop new products to cater to the changing demands of their clients (Chiang & Hung, 2010). With survey data collected from different persons with time lag, this study finds that team aggregated HCWS is positively related to team-level TMS and that the team TMS is positively related to the performance of the NP the team develops.

This study possesses significance to the literature regarding TMS and new product development. Previous authors have examined several antecedents of TMS, such as communication (Peltokorpi & Manka, 2008), interpersonal trust (Akgun et al., 2005), and team stability (Lewis, Belliveau, Herndon, & Keller, 2007; see Ren & Argote, 2011 for a review). However, mechanisms like trust and communication suggest that extant scholarship has paid more attention on exploring how TMS may be formed through informal interactions among team members than by managing team workers with a set of explicit, systematic management practices.

Based on the HR system theory (Lepak et al., 2006), this study argues that the company can implement a set of systematic HR practices with workers in NPD teams to nurture team members' specialized knowledge, provide them with the opportunities to learn of the expertise of their colleagues, and motivate them to cooperate with their teammates and use others' expertise to accomplish a joint task. In this way, this study reminds scholars of a TMS antecedent that has so far been neglected in the TMS literature.

This study also possesses meaning to the literature about new product development. Although previous scholars have validated TMS' beneficial effect with NP success (Akgun et al., 2006, 2005), this study extends the research into TMS and NP development by demonstrating a way for managers to develop a TMS in NPD teams to boost NP performance. In this way, this study can offer useful advice to managers of NPD teams.

The following sections discuss the relevant theories as well as derive hypotheses. The authors then discuss the research method and report the findings. Implications of the results are discussed in the final section.

2. Theories and hypotheses

2.1. The transactive memory system

Transactive memory (TM) refers to a set of knowledge possessed by the members of a team combined with an awareness of who knows what within the team (Rau, 2005, p. 746; Wegner, 1986). TMS, on the other hand, refers to a shared system that people in relationships develop for encoding, storing, and retrieving information about different substantive domains (Hollingshead, 1998; Ren & Argote, 2011, p. 191). Although the terms TM and TMS are used interchangeably, TM exists in the mind of an individual but TMS is a collective construct that exists among individuals as a function of team members' individual transactive memories (Lewis, 2003, p. 588; Peltokorpi, 2008, p. 379).

Research indicates that TMS functions through encoding, storage, and retrieval phases (Peltokorpi, 2008, p. 379; Wegner, Erber, & Raymond, 1991). In inferring the existence of TMS in a team, Liang,

Moreland, and Argote (1995) argue that specialization, credibility, and coordination behaviors can adequately represent the distributed and cooperative memory characteristics of the TMS. Based on this argument, Lewis (2003) proposes that TMS exists when team members (1) develop specialized knowledge, (2) trust and rely on others' expertise, and (3) integrate knowledge in a coordinated fashion (p. 590). The above components: specialization, credibility, and coordination, have been used to measure TMS in several empirical studies (Zhang, Hempel, Han, & Tjosvold, 2007, see Ren & Argote, 2011 for a review). Relevant research has also validated that TMS can induce better team performance (Faraj & Sproull, 2000; Rau, 2005; Peltokorpi, 2004; Akgun et al., 2005, see Ren & Argote, 2011, p. 206 for a review).

Studies on the antecedents of TMS find that team member familiarity (Akgun et al., 2005), communication (Peltokorpi & Manka, 2008), interpersonal trust (Akgun et al., 2005), and task interdependence (Zhang et al., 2007) are related to higher TMS in work groups. Other scholars find that incongruent goals among individual experts in a group deter members' sharing useful information with others (Jarvenpaa & Majchrzak, 2008). Such findings indicate that, to expect better team outcomes, managers should encourage team communication, facilitate knowledge dissemination, and design works to ensure congruent goals among team members to facilitate TMS formation in work teams (Lewis & Herndon, 2011).

In the next paragraphs, this study will draw on the strategic human resource management (SHRM) literature to show how implementing a set of coherent HR practices with members in NPD teams can create favorable conditions for TMS development.

2.2. The HR system theory

HR theorists argue that since employees are exposed to multiple HR practices simultaneously, understanding the influence of HR practices with workers requires a focus on the interactive effects of a set of related HR practices (Delery & Doty, 1996). Because these related HR practices do not affect workers independently, they need to be analyzed together at the level of the HR system (MacDuffie, 1995). The HR system that this study examines is the high commitment work system, also called HCWS (Collins & Smith, 2006).

Although the exact HR practices examined in the HR system literature vary among studies, scholars argue that companies adopting a set of commitment-based HR practices with their employees generally emphasize at least three broad aspects: (1) creating an internal labor market by promoting from within, (2) adopting team-based compensation to encourage knowledge sharing and organizational commitment, and (3) providing training and adopting performance appraisal aimed at employee growth and development (Collins & Smith, 2006, p. 546).

As evidence accumulates on the beneficial effects of HR system with firm performance (Huselid, 1995; see Lepak, Liao, Chung and Harden, 2006 for a review), scholars also begin to explore why HR systems may enhance organizational outcomes (Bowen & Ostroff, 2004). In explaining the mechanism through which HR system benefits firm results, Lepak et al. (2006) proposed a theoretical model, arguing that HR system promotes organizational outcomes by first improving the performance of individual workers in three ways. First, the HR system can improve employees' abilities to perform by offering training and developmental programs. Second, the HR system can provide employees the opportunities to perform by structuring work and allowing for employee involvement. Third, the HR system directly motivates employees to perform by offering incentives and rewards, and indirectly motivates employees to perform by shaping a climate indicating what behaviors are expected, supported, and rewarded (p. 230). Lepak et al. (2006) argue that improved individual performance, when aggregated together, promotes the performance of the collective.

The conceptual model proposed by Lepak et al. (2006) has been widely referred to in the HR system literature (Chadwick, 2010;

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