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The individual and joint effects of process control and process-based rewards on new product performance and job satisfaction



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Summary An important issue facing innovation managers is how to exercise adequate managerial control over new product development (NPD) teams in order to ensure that project goals are met. The current study advances research on this subject matter by analyzing the individual and joint effects of process control and process-based rewards on job satisfaction and four measures of new product performance. Findings from our study reveal that process control and process-based rewards can have either positive or negative effects depending on the type of performance outcome considered. Thus, process control is beneficial to new product quality but detrimental to adherence to budget, adherence to schedule, and team's job satisfaction. Interestingly, our results suggest opposite effects for process-based rewards. In terms of their joint effects, results suggest that firms should only combine process control and process-based rewards when their goal is to develop new products with high quality.

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Introduction

An important issue facing innovation managers is how to exercise adequate control over new product development (NPD) teams in order to ensure that project goals are met

(Rijsdijk and van den Ende, 2011). The present study focuses on two types of managerial control systems: process control and process-based rewards. Process control pertains to the specification and monitoring of the appropriate behaviors, activities and processes in which NPD teams must engage to achieve the expected project goals (Bonner et al., 2002). Process-based rewards denote a reward system that compensates NPD teams for finishing specified procedures and activities that are crucial to accomplishing the project goals (Atuahene-Gima and Murray, 2004; Li et al., 2010; Sarin and Majahan, 2001). It is worth noting that although both process

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control and process-based rewards emphasize behaviors and/or activities; these two forms of controls perform different functions. Thus, while process control centers on the provision of information (i.e., directing, monitoring and feedback), process-based rewards focus on the provision of reinforcements (Challagalla and Shervani, 1997). The purpose of this study is to address two gaps in the extant empirical research in relation to the effects of process control and process-based rewards on NPD performance.

First, although several studies have examined the impact of process control and process-based rewards on NPD performance (e.g., Bonner et al., 2002; Li et al., 2010; Poskela and Martinsuo, 2009); the empirical findings to date have been ambiguous on both fronts. Regarding the effect of process control on new product performance, the empirical evidence is mixed suggesting negative (e.g., Bonner et al., 2002), positive (e.g., Tatikonda and Montoya-Weiss, 2001) and non-significant (e.g., Rijdsdijk and van den Ende, 2011; Poskela and Martinsuo, 2009) effects of process control of new product performance. Similarly, extant research provides a confusing picture of the performance impact of process-based rewards, with empirical studies reporting positive (e.g., Song et al., 1997), negative (e.g., Sarin and Majahan, 2001) and non-significant (e.g., Li et al., 2010; Chang et al., 2007) effects of process-based rewards on new product performance. The unclear findings may stem from the fact that with a very few exceptions (i.e., Sarin and Majahan, 2001; Rijdsdijk and van den Ende, 2011), most studies have used general or aggregate measures of NPD performance as the outcomes under investigation and ignored the fact that process control and process-based rewards can have differential effects across different performance outcomes. The current study therefore advances extant research by examining the effects of process control and process-based rewards on four separate dimensions of new product performance, mainly, product quality, adherence to budget, adherence to schedule and commercial success. Having a deeper understanding of the nature of the consequences of process control and process-based rewards is important, as managers may prioritize different outcomes such as development costs, development time or product quality in different projects and may therefore need to adapt the controls that they use to the outcomes they primarily want to attain (Rijdsdijk and van den Ende, 2011). The present study also investigates the impact of process control and process-based rewards on job satisfaction. The issue of how management controls affect job satisfaction of NPD teams has received little research attention so far. This again is an important gap as job satisfaction has been widely recognized as a strong determinant of team effectiveness and performance (Barczak and Wilemon, 2003; Rodríguez-Escudero et al., 2010).

Secondly, it is unclear how process control and process-based rewards, together, can affect new product performance outcomes and job satisfaction. On one hand, one could argue that the simultaneous use of process control and process-based rewards could have synergistic effects. Thus, Sarin and Majahan (2001) stated that rewards and punishments are logical extensions of the control process, following information, monitoring and feedback. Rewards are important to control systems because people recognize actions that lead to positive consequences, repeat

those actions, and avoid any action that lead to negative consequences (Challagalla and Shervani, 1996; Poskela and Martinsuo, 2009). Therefore, the use of process-based rewards along with process control can further reinforce the completion of those procedures and activities considered critical to accomplishing the project goals, strengthening the positive effects of process control. Also, contingent rewards such as process-based rewards are said to increase employees' perceptions of workplace justice (Podsakoff et al., 2006), which could help reduce some of the negative consequences of process control. On the other hand, rewarding has been associated with decreased intrinsic motivation and hampered creativity and even it has been interpreted as a type of bribe used to induce employees to do something that they may otherwise be reluctant to do (Burroughs et al., 2011). From this point of view, process-based rewards could offset (increase) the positive (negative) performance effects of process control. Unfortunately, to date there has not been research examining how process-based rewards influence the effectiveness of process control. Although previous work has examined the influence of process control (e.g., Bonner et al., 2002; Rijdsdijk and van den Ende, 2011) and the influence of process-based rewards (e.g., Sarin and Majahan, 2001) on new product performance separately, no study has considered their joint effect. Therefore, the second objective of this study is to examine the joint effects of process control and process-based rewards on job satisfaction and several measures of new product performance.

Overall, this study makes two important contributions to the extant literature. First, this study provides a clearer and more refined picture of the impact of process control and process-based rewards on new product performance. As noted above, most research on the impact of process control and process-based rewards has considered general performance measures as the outcomes under investigation. In a significant improvement over existing studies, this study examines the impact of process control and process-based rewards on five different performance outcomes: adherence to budget, adherence to schedule, product quality, commercial success and job satisfaction. Second, this is the first study to report on the combined effects of process-based rewards and process control on new product performance and job satisfaction. To this day, research on this subject was lacking and thus it was unclear how these two types of control together affect new product performance outcomes. Our results show that the simultaneous use of process control and process-based rewards leads to both synergistic and incompatible effects depending on the nature of the project outcomes.

Theoretical model and definitions

Fig. 1 illustrates our theoretical model, which proposes that process control and process-based rewards individually and jointly impact product quality, adherence to budget, adherence to schedule, and job satisfaction. Indirect effects of process control and process-based rewards on commercial success are also posited via the above mentioned outcome measures. As noted earlier, process control refers to the extent that management attempts to achieve desired ends

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