

# Knowledge contribution in information system development teams: An empirical research from a social cognitive perspective

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## Abstract

The extent of knowledge contribution is the key to the success of system development projects. Knowledge contribution refers to the knowledge that is provided to increase a team's efficiency and achieve its goal. This study proposes a research model exploring factors that influence the extent of knowledge contribution from a social cognitive perspective. These factors include the team relationship commitment, team relationship norms, and awareness of expertise location. Additionally, this study argues that a team's awareness of expertise location mediates the effects of affective commitment and relationship norms on knowledge contribution. The result shows that the awareness of expertise location plays a crucial mediating role in the relationships between the two socially prescribed motivations and knowledge contribution. Moreover, team relationship commitment has an important impact on team established relational norms.

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*Keywords:* Knowledge contribution; Social cognitive theory; Team relationship commitment; Team relational norms; Expertise location

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## 1. Introduction

Today, information system development (ISD) teams face greater challenges as they are compelled to adapt to changing business needs and technical issues, as well as deliver desired deliverables on time and under budget (Jaros et al., 1993; Lee and Xia, 2005). Rapid changes in business conditions and contexts add to the uncertainty in ISD projects (ISDPs). Consequently, the effective application and integration of the knowledge possessed by a team in swiftly responding to unexpected disruptions in the course of development have become salient factors for successful project performance (Lin and Huang, 2010; Mitchell, 2006). To address the growing challenges arising from socio-technical environments, recent research on systems development has devoted increasing attention to demonstrate how knowledge can

be shared in a contributive manner. Past research has primarily utilized a bivariate approach relating predictor variables to contributions, focusing on the effect of personal motivations on contributions (e.g., Wasko and Faraj, 2005). These studies argue that voluntary contributory behaviors take place when individuals are intrinsically and/or extrinsically motivated by the expectation of receiving personal benefits (e.g., reputation, recognition, autonomy, pay, and promotion); giving away knowledge eventually causes the possessors to lose their unique value relative to what others know. This approach has facilitated significant contributions to identify specific motivations that correlate with knowledge contributions.

Previous research has made substantial contribution to the understanding of contributory behaviors. However, evidence indicates that knowledge contributory behaviors are not explained by the above-mentioned motivation-related factors alone, suggesting that the investigation of other factors is required (Bock et al., 2005). There are two reasons accounting for the insufficiency. First, the extant studies overlooked the fact that the individuals

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reside in an open environment and their contributory behaviors are likely to be socially influenced. Previous research has noted that knowledge contribution involves important social influence (Argote et al., 2000; Bock et al., 2005; Kankanhalli et al., 2005). Social influence refers to the ways in which external forces alter an individual's thoughts, feelings, and attitudes, or behaviors. In the ISD context, contributing knowledge is not solely an individual phenomenon since a successful ISDP requires a high degree of team cooperation. In such a context, ISD team members may perceive institutional influences from external constituents. These external effects prescribe norms, rules, and values that could exert profound impact on individuals' attitudes and eventually shape their behaviors. In this study, we argue that perceived social influences may lead to knowledge contribution as they constitute an institutionalized ambiance in which contributory behaviors are expected and considered desirable.

Secondly, motivation may be a necessary driver for individual intention to share knowledge and skills. However, having motivation is insufficient for contributory behaviors to be effective because willingness to share knowledge does not guarantee that the knowledge exchanged is appropriate for the problems encountered. Some authors have acknowledged that motivation's effect on knowledge contribution involves mediating mechanisms pertaining to cognitive elements. Limited attention has been paid to specify the cognitive mechanisms through which contributory acts take place in group contexts. However, these studies either have not integrated cognitive and motivational explanations of contributions (Hinds and Pfeffer, 2003) or merely develop conceptual models in which mediating mechanisms are delineating for contribution behaviors (Olivera et al., 2008). Few studies have explicated the role of the cognitive mechanism through which socially molded motivations affect knowledge contribution.

To fill this gap, the present study draws on social cognitive perspective as a theoretical base for investigating the social factors and mechanisms influencing knowledge contribution. More specifically, the purpose of this study is to examine the relationship among social influences and knowledge contribution and the cognitive mechanism that mediates the relationship. To this end, we develop a model of knowledge contribution fostered by the presence of social and cognitive elements. The present approach contends that socially molded motivational factors initiate, sustain, and carry to completion the activities that are necessary for making a contribution. The cognitive constituent involves searching and matching activities that mediate the effect of motivation to contribution behaviors (Olivera et al., 2008). Team relationship commitment, relational norms, and awareness of expertise location serve as antecedents for determining whether knowledge contribution can be enhanced. While team relationship commitment and relational norms represent socially molded motivations, awareness of expertise location indicates the cognitive element in the research model. A survey of 71 ISD teams in Taiwan indicates that the model holds, demonstrating that shared cognition emanating from social behaviors and norms collectively promote desired knowledge contribution. The implications of the findings for researchers and practitioners are also discussed.

## 2. Background

The importance of knowledge contribution has long been recognized as crucial to the success of an organization (Schultze and Leidner, 2002). The benefits of contributory acts include improved productivity and quality (Haas and Hansen, 2007). Knowledge contribution describes the extent to which knowledge exchanged from an individual is valuable to other individuals. Knowledge contribution concerns not only the willingness of individuals to share knowledge to others (Bock et al., 2005) but also the delivery of appropriate and useful knowledge to the individuals who need it. Research has suggested that effective contribution involves a deeper form of integration between knowledge providers and recipients. The underlying mechanism characterizing the integration is that there exists a shared knowledge between knowledge contributors and recipients (Cramton, 2001). When help is requested, mutual knowledge allows the contributors to formulate their contributions with an awareness of what their addressee does and does not know. Furthermore, mutual knowledge provides frames of reference that increase the likelihood of comprehension and accurate evaluation whether the knowledge provided is appropriate and useful to the problems (Nelson and Coorridor, 1996). In other words, knowledge contribution goes beyond the information sharing level and describes that the knowledge being exchanged is relevant and can be applied to solve a particular problem, the organization comes across. Knowledge contribution focuses on the quality of knowledge (King and Marks, 2008), while knowledge sharing addresses the quantity of information flow (Augley et al., 2007).

In ISDPs, the knowledge contributions of team members in knowledge management systems are useful for existing and future projects (Watson and Hewett, 2006). In particular, open source software development depends heavily on the voluntary knowledge contribution of team members because it is a primary component of IS development (Oreg and Nov, 2008). In this study, knowledge contribution is conceptualized as the outcome of effective delivery of problem-related knowledge from reliable knowledge contributors to the recipients. The extent of knowledge contribution depends on its appropriateness, usefulness, and helpfulness in resolving problems. Appropriateness pertains to the instance at which knowledge exchanged enables the provision of relevant solutions to problems (Wasko et al., 2004). Usefulness signifies that knowledge transferred is inclusive and reliable (Ma and Agarwal, 2007; Wasko et al., 2004). Helpfulness indicates that knowledge provided corresponds to the problems (Olivera et al., 2008; Wasko and Faraj, 2005).

Social cognitive theory forms the basis for understanding the effect of social influence on individual behaviors such as knowledge contribution. Social cognitive theory focuses on the interaction of individuals and the environments in which they reside, as well as its effect on individual behaviors. The perceived environmental forces (e.g., social norms, codes, and structure) provide expectations and require meaningful and justifiable behaviors, rendering motivation that in turn incites an individual to act in a certain manner (Bandura, 1986; Wood and Bandura, 1989). Team relationship commitment and relational norms

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