# Examining the factors influencing cross-project knowledge transfer: An empirical study of IT services firms in China

Dali Zhao [a,b], Meiyun Zuo [c,*], Xuefei (Nancy) Deng [d]

[a] *College of Economics and Management, North China University of Technology, Beijing, China*
[b] *Key Laboratory of Data Engineering and Knowledge Engineering, Renmin University of China, Beijing, China*
[c] *Key Laboratory of Data Engineering and Knowledge Engineering, School of Information, Renmin University of China, Beijing, China*
[d] *College of Business Administration and Public Policy, California State University, Dominguez Hills, USA*

## Abstract

Despite the significance of the knowledge initiatives at project level, our understanding of knowledge transfer between projects and of its influencing factors remains limited. Drawing on knowledge transfer and project management literature, we develop a theoretical model positing that cross-project knowledge transfer is influenced by project teams' transfer capabilities, project teams' relationship, project task context and project team context. We adopt mixed methods and empirically test the model in the context of Chinese IT services firms. Our data analysis reveals that cross-project knowledge transfer is affected differently by the capabilities of and governance efforts by the source and recipient teams. Our study concludes that project-based organizations and project managers will be able to better manage the complexity of cross-project knowledge transfer if they simultaneously consider the multiple dimensions of factors underlying the complex knowledge transfer process and be mindful of the source and recipient of knowledge in the project setting.
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## 1. Introduction

Organizations increasingly use knowledge worker teams to accomplish projects, and believe that teams can benefit from the accumulated knowledge and learning from other projects. When knowledge acquired and created within a project (referred to as "source project" or "base project") is transferred to and used by another project (referred to as "recipient project" or "new project"), cross-project knowledge transfer occurs (Newell and Edelman, 2008). Such cross-project knowledge transfer exerts a positive impact on project outcome, such as accelerating the project implementation process and improving project efficiency and service quality (Landaeta, 2008; Park and Lee, 2014; Petter and Vaishnavi, 2008). However, cross-project knowledge transfer is not always successful. For example, a

source project team may find it difficult to document and store "lessons learned" in knowledge repositories (Newell and Edelman, 2008), while the recipient project team may find most of the project-related knowledge in the repositories outdated (Pemsel and Müller, 2012), or fragmented (Pemsel and Wiewiora, 2013). The problems associated with cross-project knowledge transfer have negative impacts on the development of organizational and project management capabilities, affecting organizational performance in the long term (Scarbrough et al., 2004). How to improve the transfer of knowledge across projects continues to challenge project-based organizations (PBOs), especially those relying on project teams to perform knowledge-intensive work.

However, managing knowledge transfer across projects remains to be a challenging and complex process, because of the temporary nature of projects. The disbanding of members at a project's completion leads to the fragmentation of project-based knowledge (i.e., knowledge stored in the transactive memory system of each disbanded member), increasing the risk of

\* Corresponding author.
*E-mail addresses:* zdxlzhao@ncut.edu.cn (D. Zhao), zuomy@ruc.edu.cn (M. Zuo), xuefeideng2002@yahoo.com (X.(N.) Deng).

knowledge loss for the project-based organizations (PBOs). To make the matter worse, project teams often face time pressure to complete and deliver their projects. Under tight project deadlines, they become focused on project tasks rather than on knowledge transfer activities, causing a lack of cross-project learning (Davenport et al., 1998; Loo, 2002). Moreover, the members of a disbanded team often have little time and motivation to carefully reflect on their past experiences and to diligently document the lessons they learned for reuse in the future (Brady and Davies, 2004). The accumulated knowledge and valuable lessons learned throughout the project, if not effectively shared with other projects, can be regretfully lost.

Extant research on team knowledge transfer related information technology (IT) projects has primarily concerned the factors influencing knowledge transfer *within* the same IT project (Joshi et al., 2007; Ko et al., 2005). Project-related factors (i.e., time urgency) and the significant "projectized" characteristic (Meo et al., 2010) embedded in other factors may greatly influence knowledge transfer *across* IT projects, but their influences remain under-explored. For PBOs and project management, there are two important but under-studied questions to address: (1) *What are the main factors that may influence cross-project knowledge transfer within IT services firms?* (2) *How can these factors predict the effectiveness of cross-project knowledge transfer?*

Our study is informed by research on knowledge transfer and project management. Drawing upon prior studies on the characteristics of project management (Meo et al., 2010) and knowledge transfer in organizations (Argote and Ingram, 2000; Szulanski, 1996), we define *cross-project knowledge transfer* as the communication activities of knowledge from a source project to a recipient project so that the useful knowledge is absorbed and reused by the recipient project. In particular, our study examines if those factors impact on source project and recipient project differently.

We conduct our research in the context of IT services firms in China. This context is appropriate for addressing our research questions for two main reasons. First, IT services firms typically rely on project teams to develop products and provide services, whether building new software applications or implementing packaged systems. Consistent with McFarlan et al. (2012), we define IT services as consisting of software development and information technology services. Because IT services are based on integrating diverse knowledge domains (e.g., technology, business, and project management), the knowledge and learning accumulated by one IT services project thus become important knowledge sources for other projects. It is essential for IT services firms to efficiently and effectively share those project knowledge and learning. Yet, as most project teams in IT services are temporarily formed to achieve specific project goals under specified timeframes, the quick disbanding of team members at the completion of a project often causes the loss of useful project knowledge and limits its subsequent reuse (Disterer, 2002). Second, Chinese IT services market has undergone fast growth over the last decade and has paid increasing attention to knowledge transfer initiatives in organizations and at projects. According to a recent IBISWorld report (2013), the IT services industry in China

has been growing at an annualized rate of 6.8% over the past five years, with expected total revenue of $100.4 billion in 2013, which is up 9.0% from the total revenue in 2012. For an IT services firm to grow into a major player in this burgeoning industry and to become competitive in the global IT marketplace, it must learn how to manage their project knowledge effectively.

The remainder of the paper is organized as follows. First, we review relevant literature on knowledge transfer to identify the main factors affecting the effectiveness of cross-project knowledge transfer and develop a research model with hypotheses. We then describe the mixed methods used in the study; we combine an empirical study based on survey data to test our hypotheses and a case study for an in-depth understanding of the complex phenomenon of cross-project knowledge transfer. Data analysis and findings are presented subsequently. We conclude the paper with a discussion of the implications of our findings and directions for future research.

## 2. Literature review and theoretic model

Our study of cross-project knowledge transfer is informed by extant research on knowledge transfer in organizations. Based on the established generic framework of the factors influencing knowledge transfer in the organizational context, we develop a theoretic model to incorporate the factors influencing cross-project knowledge transfer at project level.

### 2.1. Knowledge transfer in organizations

Organizational scholars have examined knowledge transfer from different perspectives. Most studies adopt the communication perspective and view knowledge transfer as a process of two sub-processes—sending knowledge and receiving knowledge—during which the source communicates knowledge with the recipient (Ko et al., 2005; Szulanski, 1996). Other scholars highlight the consequence of the process and the differences in contexts when examining knowledge transfer in organizations. For example, Argote and Ingram (2000) emphasize the importance of absorbing and applying the transferred knowledge, and define knowledge transfer as "the process by which one unit of an organization, such as a group or department, is affected by the experience of another." Singley and Anderson (1989) view knowledge transfer as the process of applying the knowledge acquired in one situation to another and highlight the role of context in knowledge transfer.

Furthermore, organizational scholars have conducted numerous studies to identify a set of key factors influencing knowledge transfer. Taking both communication process and context into account, Szulanski (1996) proposes four types of factors, including the characteristics of knowledge (i.e., causal ambiguity and unproven), the source (i.e., motivation and perceived reliability), the recipient (i.e., motivation, absorptive capacity and retentive capacity) and context (i.e., organizational management mechanism). Similarly, Gupta and Govindarajan (2000) adopt the perspectives of communication process and information flow, and propose an expanded list of five key elements: (1) perceived value of the knowledge from the source, (2) motivational