



Managing Knowledge Transfer in Offshore Software Development: The Role of Copresent and ICT-Based Interaction

Aini Aman, University Kebangsaan Malaysia, Malaysia

Brian Nicholson, Manchester Business School, UK

ABSTRACT

The aim of this article is to examine the role of copresent interaction and the extent to which this can be supplanted by information and communication technology-based interaction for managing knowledge transfer in distributed settings. This study draws on two case studies of small UK firms sourcing software development from India and Bangladesh. Using Nonaka and Konno's knowledge creation theory, the role of copresent and ICT-based interactions in managing knowledge transfer is explained. The article contributes an extension of the concepts of knowledge creation theory by providing evidence of the role of copresent and ICT-based interaction for knowledge transfer in the context of offshore software development.

Keywords: Bangladesh, ICTs, Knowledge Transfer, Offshore Software Development

INTRODUCTION

Offshore software development refers to the process of sending tasks at various stages of the software development lifecycle to suppliers in low-wage countries. This may involve direct ownership of foreign facilities, partnering, or outsourcing (Shao & Smith David, 2007; Carmel & Tija, 2005). There is a large, expanding literature on knowledge transfer (see Schultze & Leidner [2002] for a review) and an increasing focus on the complexities of knowledge transfer between software team members that are sepa-

rated across time and space (e.g., Nicholson & Sahay, 2004; Kotlarsky, Oshri, Hillegersberg, & Kumar, 2007; Cha, Pingry, & Thatcher, 2008; Vlaar, Fenema, & Tiwari, 2008). Other authors have questioned the need for co-present interaction for effective knowledge transfer in such scenarios (Boden & Molotch, 1994; Maznevski & Chudoba, 2000; Nardi & Whittaker, 2002; Oshri, Kotlarsky, & Willcocks 2007). Boden and Molotch (1994) emphasize how co-present interaction contributes to the development of trust. This concurs with the findings of Maznevski and Chudoba (2000), who describe the importance of initial co-present meetings to establish effective temporal rhythms like

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'heartbeats' which support subsequent stages of global virtual teamwork. Nardi and Whittaker (2002) point out how copresent interactions allow bodily shared activities such as touching, eating and drinking together, or engaging in mutually meaningful experiences through socialization in a common physical place. They argue that copresent interaction is particularly useful as it is 'thick' with information and can enable a transfer of greater degree of contextual knowledge than ICT-based interaction. Oshri et al. (2007) also emphasize the importance of copresent meetings for creating interpersonal ties and facilitating socialization. However, in their study, socialization in globally distributed teams is also supported by the use of various collaborative technologies employed before and after copresent meetings.

A gap in the existing academic literature and a problem facing practitioners is that although copresence is desirable for knowledge transfer, arrangements may be logistically impossible or cost prohibitive. This article aims to improve our understanding of the practices firms are adopting to overcome the dilemma between the need for co-presence on the one hand and the drive for lowest cost ICT-mediated offshore outsourcing on the other. The study is guided by the following research questions:

- What is the role of co-present interaction for knowledge transfer?
- How can ICT-based interaction enable knowledge transfer?

The empirical study draws on two cases of UK-based software companies sourcing software development from India and Bangladesh. The contribution of the article lies in the application and extension of the concepts of knowledge creation theory or "SECI-Ba" (Nonaka & Konno, 1998), enabling an analysis of the knowledge transfer practices and difficulties experienced. The article is organized as follows. The next section presents the literature review and theoretical framework drawing on concepts derived from SECI-Ba. Subsequently

in the research methodology section, we explain the data collection and analysis approach. Following this is the discussion and analysis of the findings, and finally we present the conclusions and limitations of the study.

THEORETICAL FRAMEWORK

The theoretical basis draws on knowledge creation theory (Nonaka, 1994; Nonaka & Konno, 1998). This theory presents knowledge as created and transferred through a continuous dialogue between tacit and explicit knowledge along four patterns of interaction—socialization, externalization, combination, and internalization (SECI)—that create a 'spiral' model of knowledge. Tacit knowledge is broadly understood as intuitive and unarticulated, while explicit knowledge is knowledge that can be codified or documented (Nonaka & Konno, 1998). The concept of 'Ba' refers to a "shared space for emerging relationships," which can be physical (e.g., office, dispersed business space), virtual (e.g., e-mail, teleconference), mental (e.g., shared experiences, ideas, ideals), or a combination of all three. For Nonaka and Konno (1998), knowledge is embedded in Ba and acquired through one's own experience or reflections on the experiences of others within Ba. The authors identify four Ba types that correspond to the stages of the SECI model: originating Ba (copresence), interacting Ba (peer-to-peer), cyber Ba (group-to-group), and exercising Ba (onsite). Thus, each Ba supports a particular knowledge conversion process in the SECI model, as summarized in Table 1.

Nonaka (1994) argues that tacit knowledge cannot be formally articulated between individuals and can only be exchanged through joint activities. Originating Ba provides a physical context for 'socialization', an existential space where individuals can share feelings, emotions, and experiences, hence removing barriers, as well as increasing trust. Examples are group physical activities or educational visits (Kostainen, 2002). Secondly, 'externalization' is the process of converting tacit knowledge into

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