Explicit Knowledge Transfers in New Product Development

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ABSTRACT

The literature on learning in new product development (NPD) documents the processes globally but is short on specifics. Knowledge levels are not clearly conceptualized, nor are there clear devices for documenting knowledge transfers in terms of knowledge levels. This paper presents the methods of a qualitative research approach for measuring knowledge transfer directly in terms of knowledge. The paper specifically addresses the commonly avoided dimension of knowledge, depth. The methods are derived from a real-life comparative case study exploring knowledge sharing in product development. Our focused interview approach has been refined to avoid unproductive digressions by the subjects and certain forms of bias, yet still obtain rich accounts of project events. Evidence of transfer obtained by the interviews is analysed in terms of three knowledge dimensions: scope, depth and action. Methods for aggregating and interpreting data are discussed and an operational flowchart for knowledge transfer coding is proposed.

Keywords: Case Study, Knowledge Transfer, Innovation Management, Literature, New Product Development (NPD)

INTRODUCTION

In the digital economy, the need for managing data, information and knowledge is ever-increasing. Technological advances such as supply-chain management, customer relationship management (CRM) and radio frequency identification (RFID) aim to enhance firm performance by passing data packets throughout the organization. Sadly, data packets by themselves do not automatically translate into effective knowledge transfers. Therefore, a failure to craft the underpinnings of knowledge transfers from multiple organizational resources such as people, technologies and processes, leaves firms struggling with a plethora of data and a paucity of knowledge.

The area of interest here is technological new product development (NPD), where learning dominates the process as well as its outcome. Product development is an appropriate area of study for knowledge transfer since it represents one of the few formal activities performed by the firm facilitating guided, purposeful learn-
ing across the entire organization. Hitt, Ireland and Lee (2000) state two forms of learning: acquisitive and experimental. Acquisitive learning is the acquiring and internalizing of external knowledge outside the firm’s boundaries, mostly during the innovation or adoption stages. Occurring mainly in NPD’s early innovation phase, acquisitive learning eventually giving way to experimental learning in the latter stages of development and production ramp-up. In complementary fashion, experimental learning is the result of coordination and active experimentation by members who acquire new knowledge, distinctive to the organization, to build templates of best practices that would become standard operating procedures (SOPs) in the development and transfer stages.

Our study investigates the rich tapestry of knowledge transfers as experimental learning paves the way towards creating SOPs. It is established that development and production ramp-up require stronger adherence to leveraging explicit knowledge (Terwiesch & Böhn, 2001). In studying agent-driven process reengineering of organization knowledge from discovery to application, Datta (2008) notes how explicit knowledge creation is a prelude to knowledge application; Datta and Acar (2010) delve deeper to unravel how routinizing knowledge creation in organizations requires codification of knowledge. In this paper, the scope of knowledge transfers is primarily focused on explicit knowledge transfers. Given that our area of investigation is on knowledge transfers during production rather than the ab initio knowledge discovery and creative synthesis, our emphasis is on the transference of explicit knowledge specifications into a streamlined production environment.

Effective NPD requires effective knowledge flows (Mentzas, Halaris & Kavadias, 2001). Nonaka’s (1991) attribution of knowledge as a dynamic resource created by the processes of combination and externalization is augmented by Gold, Malhotra and Segars (2001) who finds that knowledge flows are “embedded within, available through, and derived from the network of relationships”. Together, knowledge transfer is a process where an organization recreates a complex, causally ambiguous set of routines across various development environments (Szulanski, 2000).

Also germane to our investigation are research thrusts from work on knowledge replication (Nelson & Winter, 1982; Winter & Szulanski, 2001; Baden-Fuller & Grant 2004) and Nonaka and Takeuchi’s (1995) knowledge transfer research with an emphasis on combination and externalization. Nelson and Winter’s (1982) reference to “templates”, or examples encompassing the knowledge, as the locus of knowledge transfer was appended by Baden-Fuller and Winter’s (2006) inclusion of “principles”, or ideas encompassing the knowledge, as a complement. While templates and principles offer knowledge transfer artifacts, Nonaka and Takeuchi’s (1995) research concentrates more on the knowledge transfer process. With explicit knowledge, the knowledge flow process focusses on combination (knowledge mobilization through synthesis and integration) and externalization (mobilization by embodiments in manuals, new products and services). Without a mechanism to manage knowledge flows, shared knowledge can increase complexity and variance (Szulanski, 1996). In a product development and production environment, variance can impede performance; it becomes important to discover patterns of knowledge that can be replicated in product development processes and embed these routines as SOPs and best practices.

The paper explores the mechanics of knowledge flows in the context of explicit knowledge transfers and sharing in NPD. It is organized as follows. The first section reviews some relevant literature on knowledge measurement, organizational learning and new product development. The second section discusses our approach to measuring knowledge through semi-structured interviews and presents a rich yet adaptable coding scheme for capturing knowledge depth. The third section describes the cognitive and affective impediments encountered during the course of probing interviews with project participants. Included in this section are some
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