Does Knowledge Management Systems Moderate Turnover Effects?
A Study on Software Development Teams

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ABSTRACT
Knowledge assets are key to innovative capability, but are perishable and may decay over time. Knowledge Management Systems (KMS) can prevent knowledge decay and maintain and enhance performance and innovation. This paper investigates if the use of a KMS mitigates employee turnover negative effects on organizational performance. Data on turnover and project performance from two software development teams from the same corporation were collected and compared. One team adopted and uses a KMS to support development, while the other did not implement a KMS. Paired t-tests were performed and confirmed that KMS usage moderate turnover impact on organizational performance. There is also evidence that, when KMS are not used, turnover and performance are correlated with a time lag. From a practical stance, results indicate that knowledge intensive firms can avoid knowledge assets loss by implementing a KMS.

Keywords: Innovative Capability, Knowledge Assets Loss, Knowledge Management, Knowledge Management Systems (KMS), Turnover

INTRODUCTION
Knowledge assets are the foundation of competitive and innovative capability, and, as non-rival goods, are not depleted by use. However, they are perishable, and can decay over time, due to employee turnover, technology obsolescence and poor recording systems (Argote et al., 1990). Among the organizational knowledge repositories, people is the most important one, from the managerial team to the operatives, and thus, even the exit of one person may represent significant loss to the firm. It may lead to poorer performance, loss of work experience and or-
Organizational memory, and decay of internal and external social networks (Massingham, 2008; Jennex & Durcikova, 2013). As turnover, and the resulting knowledge loss, is potentially harmful to the organization, the literature on turnover deals with its negative impact on organizational long-run performance and innovative capability (e.g. Meier & Hicklin, 2008; Whitt, 2006; Guidice et al., 2009).

Knowledge Management Systems (KMS), IT-based systems designed to enhance knowledge creation, storage and dissemination (Alavi & Leidner, 2001), can store and distribute large amounts of information at low cost. Albeit limitations, they can contribute to knowledge preservation, as information from a firm’s previous experiences can be stored, recovered and used. Thus, KMS can mitigate knowledge losses due to turnover (Lee & Van den Steen, 2010), and may contribute to improve organizational performance (Pietrantonio, 2007). However, although the literature on the use of KMS studies its effects on innovation and agility, there is little empirical evidence on whether it moderates turnover impact on knowledge assets.

This paper aims to help to fill that gap, by investigating the KMS implementation effect on knowledge stocks and organizational performance. To put it clearer, its purpose is to verify if the use of a KMS can moderate the effect of turnover on organizational performance. To accomplish the task, it analyses data from software development units of FinCorp, a Brazilian financial conglomerate located in Sao Paulo. Information technology applications are at the heart of financial operations, and FinCorp, as many Brazilian financial corporations, keep in house software development capability. Software development is a knowledge intensive activity, relying extensively on the exploitation of knowledge-based assets (Van de Ven, 2005; Alvesson, 2004), and it constitutes a relevant setting to study the effect of using a KMS.

FinCorp have two independent business units, Alpha and Beta, and each keeps its own software development team. Each team develops software projects on demand, providing solutions for its business unit. Alpha’s team, struggling with quality and schedule issues, implemented a KMS, aiming to reduce errors, delays and enhance quality. Beta’s team however, facing fewer problems, had not yet adopted any knowledge management practice, relying on informal training and knowledge sharing. Alpha’s team started to implement the KMS in January 2008, and it was fully operational six months later (data on system accesses shows that it has been extensively used since its deployment). Due to FinCorp internal issues, both teams faced high turnover rates during 2009. Data on project performance and turnover of each team from January 2007 to December 2009 was collected and compared, allowing to assess the impact of the use of KMS.

Despite data might be considered limited, as they come from two teams of one company, those teams perform similar tasks and are subjected to the same corporate and HR practices, and the only relevant difference during the period of observation was the KMS adoption by one of the teams. Thus, KMS usage effects can be isolated, and results although limited, allow conclusions. Paired t-tests on collected data indicated that KMS usage prevented project delay increase, confirming its positive effects over organizational performance. From a practical stance, results indicate that knowledge intensive firms can avoid knowledge assets loss by implementing a KMS.

**TURNOVER AND KNOWLEDGE LOSS**

Organizational knowledge can decay over time, due to employee turnover, poorly designed or faulty recording systems, lack of use, or simply because it gets obsolete or is forgotten (Argote, 1990; Jennex & Durcikova, 2013). Turnover may cause knowledge loss, especially when it is not properly shared or recorded; and structural capital loss, when individuals who contribute to create and develop routines and procedures leave the organization, impairing its ability to learn. Turnover can also represent loss of social relations, both within the organization and with
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A Cross-National Comparison of Knowledge Management Practices
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