Role of HRM in knowledge integration: Towards a conceptual framework

Abstract

Knowledge integration (KI) is a source of sustained competitive advantage for firms. This paper draws upon the knowledge-based view of the firm and ability-motivation-opportunity framework to develop a theoretical and empirical model showing the role of human resource management (HRM) practices in achieving KI. Findings suggest three ability-enhancing practices (training and development, focused hiring, and knowledge questioning values), four motivation-enhancing practices (project-specific performance, competency-based performance management, project-based information dissemination, and information and knowledge sharing forums) and five opportunity-enhancing practices (team working, information and knowledge sharing, verticalisation of business, geographical information and knowledge sharing, and structural change) that facilitate KI. The paper concludes with managerial implications, directions for future research and the study's limitations.

Keywords: Knowledge integration; global knowledge-intensive firms; HRM practices; offshoring; outsourcing; verticalisation.

1. Introduction

Knowledge management and integration for competitive advantage has gained prominence in the last two decades (Connell & Voola, 2013; Grandori & Kogut, 2002). Grant's (1996) knowledge-based view of the firm focuses on a firm's ability to apply specialist knowledge for sustained firm performance, wherein knowledge integration (KI) has been noted as a key organisational capability for applying specialist knowledge to an organisation's production function (Henderson & Clark, 1990; Grant, 1996a, b; Grandori, 2001; Okhuysen & Eisenhardt, 2002) and achieving innovation outcomes in high-technology firms (Berggren et al, 2013; Johansson, Axelson, Enberg & Tell, 2013).

Prior research found that human resource management (HRM) practices can facilitate knowledge management processes, such as, knowledge sharing, knowledge acquisition, knowledge transfer, and KI (Brewster, Suutari & Minbaeva, 2005; Cabrera & Cabrera, 2005; Foss, Minbaeva, Pedersen, & Reinholt, 2009; Minbaeva, Foss & Snell, 2009; Minbaeva et al., 2003; Minbaeva, 2013; Palmatier, Dant, Grewal, & Evans, 2006). HRM practices create a social context for knowledge management processes as these practices support the key mechanisms of direction and routines for effective KI (Chinying Lang, 2004; Soliman & Spooner, 2000; Oltra, 2005). The relationship between knowledge management processes and HRM for innovation and other performance outcomes has been noted in recent studies (Kianto, Sáenz, & Aramburu, 2017; Rupietta & Backes-Gellner, 2017).

While the above studies have enhanced our understanding of the role of HRM in the knowledge management process, we know relatively little about how HRM influences KI in the context of outsourcing firms, particularly from a vendor and foreign subsidiary perspective. This is the core focus and contribution this study offers. Mukherjee et al. (2017), for example, note that offshore outsourcing firms have different motives for knowledge

related outcomes such as knowledge replication, refinement, renewal, and recombination. They note that the success of these outcomes depends on a firm's knowledge skills and capabilities as well as client-supplier relations. Successful KI in such contexts is difficult due to cooperation and coordination challenges between the two contracting parties and parent-subsidiary relationships (Johansson, Axelson, Enberg & Tell, 2013; Söderlund & Tell, 2013).

The challenges are greater if buyers and vendors have vastly diverging cultural backgrounds and access to different knowledge and capability markets (Hofstede, 2001). To this end, this study provides a better understanding of meso-level contextual factors that affect KI in high technology firms. More specifically, as specialist knowledge, especially tacit specialist knowledge resides inside the minds of individuals, it is therefore critical to understand how firms apply (and integrate) such knowledge to their productive function. This paper argues for a critical role of key HRM practices employed by a firm to serve as enabling mechanisms for individuals to apply their knowledge to an organisation's production function. This study offers a distinctive theoretical contribution to the theoretical body strategic HRM and KI by identifying the key ability, motivation and opportunity enhancing HRM practices for achieving the goals of KI. This contribution is much needed as there is limited theoretical basis for understanding how HRM practices influence KI.

Research on this topic is critical as studies of High-Performance Work Systems suggest that bundles of HRM practices are central in creating and applying knowledge skills and abilities to an organisation's productive function for achieving sustained competitive advantage. Our study identifies key bundles of HRM practices for influencing KI goals in high-technology knowledge-intensive firms. To this end, and in line with the literature on HRM (Boxall & Purcell, 2016), we argue for a collective implementation of bundle of HRM practices to variously affect KI outcomes. The underpinning logic advanced here is that HRM practices create a social context through which efficient, effective and flexible integration of

knowledge is possible. Thus, in the context of high-technology offshore IT subsidiaries and vendors in India, this study aims to answer two specific research questions: (1) *what are the key HRM practices that influence knowledge integration?*; and (2) *why are some subsidiary and vendors firms better at integrating knowledge than others?*

Overall, this study offers three contributions. First, we offer new insights of how the goals of KI are achieved given the intricate relationships between buyers and vendors by moving the discussion from a buyer's perspective from advanced countries to a vendor perspective from an emerging market context (Lacity et al., 2010). Second, responding to the calls by Minbaeva (2008) and Garau et al., (2015), we contribute to the literature on international HRM and knowledge management by focusing on HRM practices for achieving KI goals. Employing a knowledge- and resource-based view (Barney, 1991; Grant, 1996 a, b) and utilising the ability, motivation and opportunity (AMO) framework (Blumberg & Pringle, 1982; Boxall & Purcell, 2015; Vroom, 1964), this study analyses and identifies the bundle of AMO-enhancing practices that influence KI (Minbaeva, 2013). Third, using an inductive qualitative case design, we develop a conceptual model to understand the relationship between AMO-enhancing practices that lead to efficiency, effectiveness and flexibility of KI, combining their hard (work/organisational design) and soft (by creating organisational values of open-mindedness and questioning the assumptions of information shared) aspects.

The rest of the paper is structured as follows. First, a review the literature of knowledge management processes–especially of KI and HRM practices is presented. Second, details of the methodological strategy employed is next. Third, the analysis and findings are presented. Finally, the paper offers a discussion and conclusion, with implications for theory and practice, highlighting the limitations of this study.

2. Theoretical background and conceptual framework

2.1 Knowledge management process and knowledge integration

Owing to the increased importance of knowledge-based assets, the last two decades has witnessed extensive research that focuses on knowledge management processes such as knowledge acquisition, creation, sharing, transfer and integration and various facets of firm performance (e.g. Grandori & Kogut, 2002; Grant, 1996 a,b; Hansen, 1999; McFayden & Cannella, 2004; Minabeva, 2013; Scarborough, 2003). This paper, however, focuses on KI, a critical knowledge management process that can be a source of sustained competitive advantage (Henderson & Clark, 1990; Grant, 1996a, b; Grandori, 2001; Okhuysen & Eisenhardt, 2002). Using a general systems model of inputs, process and outputs, Berggren et al. (2013) state that the primary inputs to the KI processes are a firm's knowledge base, which enables it to achieve its goals or intended outcomes of efficiency, effectiveness and flexibility of KI. By integrating such knowledge bases, firms can deliver develop new knowledge bases needed for developing new processes and products. Existing or new knowledge inputs undergo a transformation process, wherein KI process are affected by a range of contextual and organisational factors. A key outcome of KI is the "physical or informational integration of knowledge in products, processes, systems, services, and solutions" (Berggren et al. 2013: p.9). See Figure 1 for a simple depiction of this idea.

< Insert Figure 1 about here >

Although Grant (1996 a, b) acknowledges two common contextual factors that serve as mechanisms for KI – *directions* and *routines,* there are several other multi-level organisational factors that affect KI goals of efficiency, scope and flexibility of KI. In his work, Grant notes that *efficiency of KI* can be achieved by having a (1) level of shared knowledge and shared norms; (2) frequency and variability of task performance; and (3) an appropriate organisational structure. Similarly, *scope of KI* can be enhanced by increasing (1)

different types of specialised knowledge as it supports causal ambiguity; and (2) sequential and reciprocal interdependence of tasks between teams. Finally, *flexibility of KI* can be strengthened through (1) extending specialist knowledge base; and (2) reconfiguring existing pools of specialist knowledge into new organisational capabilities. In other words, KI should be *efficient*, its *scope* should be broad enough so it can applied to a wider set of productive tasks and it should be a source of *flexibility* for renewing and recombining the existing knowledge base with new and complementary specialist knowledge.

Embedded in the mechanisms for achieving *efficiency, scope* and *flexibility* of KI are aspects of *direction*, *sequencing enhancing complementary specialist knowledge base* and creating *routines* that support integration. For example, employing a common language and shared norms standardise interactions between employees. Sequencing encourages interdependence between employees, typically through the use of cross-functional team design and application of team members' complementary skills. Routines are relatively complex patterns of behaviours that allow employees to operate in a predictable fashion. Although Grant identifies the antecedents of KI goals, this study advances a case for how AMO-enhancing practices helps firm achieve KI. Thus, using the logic of equifinality (Van de Ven, & Drazin, 1985) and our above assertions, we argue that a bundle of strategic HRM practices influence KI will further develop the state of theory in KI and strategic HRM and inform practitioners with additional applications for developing such a capability.

2.2 Mechanisms supporting goals of KI

As noted above, the *efficiency of KI* can be enhanced by the processes that increases collective knowledge and how frequently such knowledge can be applied for completing the productive tasks of a firm. Firms need to have a common language for sharing its explicit

knowledge, establish behavioural norms for supporting it, and encouraging team members for efficiently integrating knowledge it in various projects.

Scope of KI requires firms to acquire and apply complementary specialist knowledge to its daily routines. Scope of knowledge increases the social complexity and causal ambiguity, which are critical aspects of a resource-based view of the firm (Barney, 1991). Through sequential interdependence of workflow scope of KI can be enhanced as employees with specialist knowledge apply their knowledge to interdependent productive tasks in socially complex work interactions (Grant, 1996a).

Finally, *flexibility of KI* is possible by extending existing knowledge base and reconfiguring it with existing or new forms of specialist and shared knowledge. Formal process that support how groups share common and specialist knowledge with other group members and apply it to productive routines enhances the flexibility of KI (Okhuysen & Eisenhardt, 2002). Grant suggests that some of this is possible by making specialist tacit knowledge explicit or looking for new common and specialist knowledge that is not in an organisation's immediate productive ecosystem. Several sources such as suppliers, partners, clients, customers and academic institutions enhance the flexibility of KI. By combining existing internal and external pools of common and specialist knowledge new architectural knowledge, for example, for innovation, can be integrated (Henderson & Clark, 1990).

Following an extensive review of the literature of KI, Tell (2013) summarised KI to incorporate three key activities: 1) sharing of knowledge; 2) the relatedness and relevance of knowledge to a work context; and 3) the ability of firms to combine or recombine existing and new specialist and complementary knowledge for its productive work tasks. While the latter two activities are critical to KI (Grant, 1996a), knowledge sharing can be inefficient as not all sharing of knowledge leads to its application. Firms that are adept in embedding and

repeating KI routines are known to possess KI capability. Our focus therefore, as Grant noted (1996a) is on integrating specialist knowledge for completing discrete productive tasks that help firms create value by transforming inputs into outputs.

Extant research also suggests that relevant and sometimes unconnected and isolated specialist knowledge resides in individual members of a team (Okhuysen & Eisenhardt, 2002) as do organisational level explanations of knowledge processes (Felin & Hesterly, 2007; Foss, 2007). Thus, for this paper, organisational-level AMO-enhancing HRM and work practices are need for understanding how individual level knowledge (Minbaeva, 2013) can support the main goals of KI.

2.3 HRM practices and knowledge management processes in knowledge-intensive firms

Although number of studies that have explored the impact of HRM and work practices on knowledge management processes such as knowledge sharing and knowledge transfer (Brewster et al., 2005; Cabrera & Cabrera, 2005; Foss et al., 2009; Minbaeva et al., 2009; Minbaeva,et al., 2003; Minbaeva, 2013), recent studies have started to explore its relationship with KI (Garaus et al., 2015; Hayton, & Macchitella, 2013). The importance of social context and managerial practices such as those embodied in HRM are critical in integrating specialist knowledge (Kang et al., 2007; Smith et al., 2005). Depending on the nature of managerial approaches and business model followed by knowledge intensive firms in the IT industry, the nature and extent to which new and specialist knowledge is integrated varies (Malik & Rowley, 2015). Furthermore, formal and informal approaches to learning and development are central in integrating new and existing knowledge for performing discrete tasks and or working across interdependent cross-functional project teams (Collins, 2001; Kang et al., 2007; Verona 1999). Offer of team-based rewards can further support integration of knowledge for performing interdependent tasks (Gomez-Mejia & Balkin, 1989).

AMO-enhancing practices is regarded as a robust framework in the field of HRM. Implementing AMO-enhancing HRM practices can create a social context for better organisational and individual level performance (Blumberg & Pringle, 1982). To this end, numerous studies have attempted to identify a system of HRM practices, which focuses on enhancing ability and motivation of employees and the opportunity to apply the skills (Applebaum et al., 2000; Kehoe & Wright, 2013). For example, Kehoe and Wright (2013) noted training, selective hiring and structured interviews as key *ability-enhancing HRM practices*. Selectively hiring people with right skills, ability, culture-fit and attitude is vital for work teams' ability to integrate diverse knowledge bases (Carbrera & Carbrera, 2005; Grandori & Soda, 1995), especially as traditional approaches to recruitment and selection are considered less effective in developing specific knowledge (Currie & Kerrin, 2003; Scarbrough, 2003). Prior experience, specialist knowledge and skills has been linked to effective knowledge sharing (Chang et al., 2012; Haas & Hansen, 2007). Cross-functional and team-based training, orientation and socialisation programmes have also been noted to positively impact knowledge sharing (Carbrera & Carbrera, 2005; Kang, Morris & Snell, 2007; Yamao et al., 2009). Kehoe and Wright (2013) note internal and external rewards and performance management as key *motivation-enhancing HRM practices*. Gagné (2009) provided an extensive review of HRM practices that motivate employees to share knowledge.

In a similar vein, Foss et al. (2009) highlighted the importance of external rewards in improving knowledge sharing behaviours, especially when employees value such external rewards. Similarly, team-based designs and the ability to interact with group members has a positive impact on knowledge exchange between employees (Hansen 1999). Finally, work design that supports empowerment and involvement of employees, contributes to individual and group decision-making or problem-solving is seen as an *opportunity-enhancing HRM practice*. Although HRM practices have been linked to several knowledge management

processes (Minbaeva, 2013; Minbaeva et al., 2003, 2009) in inter- and intra-organisational settings, very few have focused on linking a bundle of AMO-enhancing HRM practices, as key antecedents of KI goals. This paper develops a conceptual framework for understanding such relationships (Figure 2).

< Insert Figure 2 about here >

3. Methodology

3.1 Sample description

Considering the nature of research questions, Eisenhardt's (1989) suggestion of adopting an inductive approach is appropriate. An inductive approach is desirable where there are opportunities for building, extending or refining an existing theory by observing the phenomenon in a novel context. Table 1 provides the descriptive details of the case organisations. Of the seven case organisations in the sample, four organisations (Cases A–D) are from the Business- and Knowledge-process outsourcing industry whereas three organisations (Cases E–G) are offering IT products and IT services to the global IT industry. Within this mix, there are three third-party service providers (cases B, D and F) and four are subsidiaries of UK or US MNCs (cases A, C, E and G). Descriptive details about the cases and interviewees are provided in Tables 1 and 2. High-technology knowledge-intensive IT firms often need to integrate, on an ongoing basis, new types of specialist knowledge. The nature of such knowledge is challenging due to geographical distance and resultant coordination and cooperation issues between a client and its service provider or the parent-subsidiary dyad. Further, experts hold specialist knowledge across borders can integrate such knowledge through expatriation and job rotation assignments.

< Insert Tables 1 and 2 about here >

3.2 Data sources

In addition to qualitative semi-structured interview data from 59 employees, HR and training managers, CEO/COO, business development, and quality management managers from the case study organisations, secondary data from public domain, organisational documents and policies data were also analysed (See Table 2 for interviewee details). On average, the interviews ranged from 60 to 120 minutes and were transcribed verbatim.

3.3 Overview of analytical techniques

The analysis involved two stages. First, an unstructured analysis of case study data of transcripts was undertaken using Leximancer- 4, a specialist content analysis software. Next, akin to the conventional qualitative analysis, an abductive approach was employed for identifying second order themes from the first-order data concepts. This stage involved a more targeted theoretical coding using an iterative process of linking the initial concepts and codes to the AMO literature for identifying second order themes and then seeking evidence of how these variously influenced the goals of KI.

Leximancer-4 enables automated extraction of seed concepts using machine learning, statistical processes (Grech et al., 2002; Smith & Humphreys, 2006) and validated algorithms (Metropolis, Rosenbluth, Rosenbluth, Teller & Teller, 1953). The application analyses: (i) frequency counts and relational co-occurrence of text in a two-sentence block, which leads to auto-identification of key concepts and themes; and (ii) produces conceptual maps depicting the relationships between different themes and concepts (Smith & Humphreys, 2006).The application's statistical rigour reduces researcher bias typically associated with manual coding in qualitative research (Smith 2003). Hence, it is not surprising to see applications of this approach in applied disciplines such as HRM (Malik et al., 2017), marketing management (Dann, 2010), international business and psychology (Liesch et al., 2011).

3.4 Concepts and themes

Using a non-selective program, the application analyses words by concepts from a transcript using synonyms, relationships and its frequencies (Harwood, Gapp & Stewart, 2015). The resultant concepts and themes are clustered as conceptual words (Cretchley et al., 2010) after undergoing about 1000 interactions of the data (Harwood et al., 2015). Following the automatic generation of concepts, the editing function was employed to merge concepts and plural words, for example, 'process' and 'processes' into 'processes' and 'client', 'customer' and 'clients' into 'clients' and so on. This process was followed by an analysis of seed concepts and themes and its relationship with other sub-concepts and themes using conceptual map, textual exploration and frequency hierarchies relevant for this paper.

Following several iterations, a stable and re-clustered concept and theme map is presented (See Figure 3). The themes are re-labelled based on the meaning found through exploration of concepts in that group of thematic data. The maps depict themes (as circles) and concepts (as points). Regarding heat map relevancies, red circle depicts the most dominant theme, followed by shades of brown and green, and icy blue, such that shades of blue depict a somewhat less related theme in the context of the data set. The size and proximity of themes also matter, wherein, the further away a theme is from another theme, the relative similarity of the theme/concept in the context of the data set, reduces. The lines depict the path between concepts. Forty-three concepts and eleven themes were auto-generated by the software.

3.5 Preliminary analysis

Since the goals of KI were not directly measured in this study, data exploration focused on analysing theoretical concepts of AMO-enhancing HRM and workflow design practices and how these shape the efficiency, scope and flexibility of KI (Grant, 1996a). To this end, the auto-generated concept seed of 'knowledge' was explored further to understand how this

concept was related to other themes and concepts (Figure 4 provides a snapshot of key

relationships). The concept of 'knowledge' was part of the theme of 'business requirements'.

Exploration of this concept at a within- and cross-theme level provided an account of how

knowledge was integrated in the productive function or business requirements. Analysis also

suggests that organisations access and apply knowledge through organisational processes, a

view that was established by March (1991: p. 73) wherein "procedures, norms, rules and

other forms" of knowledge grows by its application and use by individuals in an

organisational system. Figure 4 shows that the concept of knowledge is related to other

concepts of process-, client-, team-, project-, product-, quality- and business-knowledge as

well as, not surprisingly, to the themes of training, scale, duration, clients and people.

Further exploration of 'knowledge' concept and its relationship with other concepts and

themes was also undertaken.

3.6 Further analysis techniques

Following an initial automated analysis of 43 concepts and 11 themes, further theoretical

coding was undertaken using abductive logic. This approach followed an iterative process of

using the preliminary codes from stage one and exploring these further to link it back to the

literature (Van Mannen, Sorensen & Mitchell, 2007) on AMO framework. Such an approach

allowed us to explore how elements of AMO framework variously influenced the goals of KI.

Using the preliminary automated analysis of first-order seed concepts or categories, the next

stage of analysis progressively identified specific AMO-enhancing practices (second-order

themes) that supported efficiency, scope and flexibility of KI (aggregate dimensions) (Gioa,

Corley & Hamilton, 2012). Figure 5 depicts the relationship between the first-order concepts,

second-order themes and the aggregate dimensions of goals of KI, which are further

explained in the next section.

< Insert Figures 3, 4 and 5 about here >

4. Data analysis and results

We identified several HRM practices influencing the goals of KI. While these practices differed in emphases at an individual case level, there were similarities in the content of the AMO-enhancing HRM practices across the cases. The findings are presented based on the relationship between goals of KI and how these were variously influenced by AMO-enhancing HRM practices. The empirical data structure guiding this analysis is presented in Figure 5 along with supporting examples of quotes for each theoretically developed second order theme in Table 5. The following section provides a detailed analysis of different AMO-enhancing HRM practices and it effect on KI (see Tables 3 and 4 for details).

< Insert Table 3, 4 and 5 about here >

4.1 HRM and efficiency of KI

The findings suggest that efficiency of KI was achieved through HRM practices of investing in *training and development* (ability), *focused hiring* (ability), *competency-based performance management* (motivation) and *team working* (opportunity). We discuss each of the HRM practices in the detail.

4.1.1 Training and development and focused hiring

From the list of 43 seed concepts, first-order concepts of *training, people, person, skills, job, knowledge* and *time* (See Figure 5) suggested the second-order theme of investing in *training and development* and *focused hiring* for KI relevant for time-bound software development projects. The standardised and modular nature of training and hiring specifications is suggestive of a common vocabulary, a 'rule-like' and 'process-driven' (Grant, 1996a) mechanism for achieving efficiency of KI. This analytical process was

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followed iteratively for all theoretical second-order AMO-enhancing themes and aggregate dimensions using input data from the first-order seed concepts. For example, Organisations A, E, F and G invested significant amounts in training and development due to their volume and diversity of projects, encompassing a range of industries and specialisations. All four firms had set up their corporate universities in India and globally, focusing on providing several common and specialist knowledge modules.

In order to recoup their local and global training investments, these four firms routinely hired graduate engineers and associates. These graduates were put through a very structured learning and development program spanning 8-12 weeks in duration, using local and global internal, and sometimes external, subject-matter trainers. The use of a common vocabulary and standardised processes for delivering training and focused hiring were the key enablers of efficient KI. Our findings take a departure from Kang et al.'s (2007) research wherein training played the role of socialising and mentoring employees for integrating specialist knowledge. In contrast, organisations B, C and D had relatively less established training infrastructure and, in some cases, was ad-hoc in nature, as the following quotation illustrates:

> *...we have clients' trainers who come over and train our people in the product knowledge. We have this voice process....[for] a UK-based broadband provider...our trainer went there, got trained in the product knowledge, came back and subsequently trained our people here. **Business Development Manager (Org. C)***

4.1.2 Competency-based performance management

First-order concepts of *business, work, specific, process, product, things, skills, knowledge, role* and *quality* (See Figure 5) suggested the importance of efficiently integrating role- and project-specific knowledge through the use of common behavioural norms of (Grant, 1996a) competency-based performance management (second-order theme). Such an approach integrates employees common and specialist knowledge using internal and external

sources (e.g. clients) of trainers. For example, the process associates and software engineers in these firms were motivated to perform at higher levels and become proficient in client-, project- and domain-specific knowledge to service their clients. This performance approach was strengthened by the use of standardised quality management processes and performance measures employing, for example, Six-Sigma methodologies.

> *…it [review process] has a performance focus on the competencies …over the last couple of years we also tried to create much more matrix oriented performance review. So, we have created a global dashboard. Whatever you call it, it essentially means that we can take a simple parameter like performance or utilisation of an individual. …if an employee's utilisation is less than 80%, he/she is not qualified to get a CRR 1 [a high rating].* **HR Manager (Org F)**

In line with Hayton and Macchitella's (2013) study, the focus on only individual attributes may only lend support to efficiency of KI and acquisition. However, by adopting a more collectivist and a shared cultural approach, higher levels of KI are possible.

4.1.3   *Teamwork*

The first-order concepts of *people, teams, organisation, group, processes, knowledge, project, doing* and *happens* (Figure 5), shows extensive use of team working (second-order theme) as a deliberate strategy to minimise duplication of tasks and creating an opportunity for employees to deepen their knowledge in areas with knowledge gaps. Deeper domain and vertical-specific knowledge was developed through the use of cross-functional teams, processes and project teams. Also by providing employees, internal and external performance feedback at a team level, specialist and complementary knowledge base was strengthened.

> *Teams are related to a project...have a direct relationship with increasing the productivity of the process ....you are at a certain level but now you need to think more of project improvements and look at [the] training related to this, so that you can take the performance from a desirable level X to X plus 10%.* **Manager Quality (Org. C)**

The use of shared behavioural norms and project- and group-specific team working (Grant, 1996a) ensured efficient integration of common and specialist knowledge.

4.2 HRM and scope of KI

The scope of KI can be enhanced by cross-functional sharing and coordination of knowledge within and across units, accessing different pools of specialist and complementary knowledge and applying it to IT and BPO projects. Through sequential and reciprocal interdependence the scope of knowledge integration can be achieved (Grant, 1996a). The findings suggest that the scope of KI was achieved by AMO-enhancing HRM practices of *project-based information dissemination* (motivation)*, competency-based performance measurement* (motivation)*, information and knowledge sharing forums* (opportunity) and *verticalisation of business units* (opportunity).

4.2.1   Project-based information dissemination and competency-based performance measurement

The first-order concepts of *project, specific, particular, examples, different, process, technical*, and *knowledge* (See Figure 5) suggests that project-based information and dissemination (second-order theme) occurs for critical knowledge of different performance dimensions for each project. Project managers' and employees' competency-based performance measurement (second-order theme) metrics suggest there are particular mandates for sharing, capturing and disseminating project-specific knowledge through numerous directed activities such as: cross-functional team meetings, team briefings, brown bag lunch sessions, white paper sharing and developing 'critical to quality' performance dashboards, shared within the team and sometimes across geographies in a similar domain. The following quotation illustrates reciprocal interdependence in information dissemination:

...we have forums ....General sharing forums, new technology, market intelligence and development [forums]– that's from the functional side. We have also got something from the business development side where we have weekly forums to discuss experiences of the project sharing sessions via audio and video conferencing happens frequently. For leadership teams there are quarterly meetings to discuss domain-specific information. ...we will have Training/Learning leaders from different CoEs [units] get together for quarterly calls; calls on functional market information sharing to share domain-specific knowledge, intelligence and, generally what work is going on in different areas and what new learning can be shared. ...Similarly, there would be a call for finance and a call for HR....quick market intelligence (QMIs) calls for HR and Learning and Development teams. For instance, we have QMIs between content solutions CoE [units] across all the three locations These calls share domain-specific knowledge related to content solutions, not learning solutions, whereas the functional QMIs have a much wider scope and are across the organisation. **VP- Content Solutions (Org. A)**

Application of different pools of common and specialist knowledge held by employees and project leaders from different projects covering a range of performance dimensions, enhanced the scope of KI (Grant, 1996a).

4.2.2 Verticalisation of business and information and knowledge sharing

The first-order concepts of *different, knowledge, people, product, project, organisation, change,* and *particular* (See Figure 5) suggests that larger firms undertook structural changes to move to a 'verticalisation' approach to engage in mutual information and knowledge sharing (second-order themes). Verticalisation of business refers to a structure which at a higher level is industry-based, followed by geography-specific structures for a given area of specialisation. For example, a firm's business may specialise in delivering networking technologies and IT infrastructure management for the Telecom industry. The firm allocates its knowledge and resources in this area, first, creating an industry-level structure, and then builds further expertise, in the same area of specialisation, drawing upon knowledge from different geographical areas e.g.

knowledge from the Americas, Europe, UK, Middle East and North Africa, Asia and so on. Such a structure allows firms to fully leverage the knowledge that resides both within its local industry specialisation i.e. Telecom, but also across its geographically dispersed business units.

> *…creation of independent business units [IBUs], creation of verticals has been a big change…. So that's has been pushed down into IBU level which is a fairly strong structural readjustment with the company's view…. So the separate IBU's would be different verticals ….capital markets, banking, retail, communication service providers, product engineering… and the service lines will cut across both the IBU's and as well as the geographic units [e.g. Americas, Europe, MENA]* **VP-HR (Org.F)**

Such an approach increases the scope of knowledge integration as firms share *different pools* of geography- and industry-specific knowledge and share information for applying specialist knowledge to a wide range of *performance dimensions* (Grant, 1996a). Different sets of organisational values and routines facilitated collaboration, coordination and interactions between employees, teams, clients and equipment suppliers. For example, Organisation A had a strong metrics-driven culture using its Six Sigma capabilities. These capabilities were embedded in daily routines of this firm. As noted by Organisation A's manager:

> *Six Sigma (SS) is a culture, it is the way we work, …it is not a drive that happens and then people pack up their bags once the drive is over. It does not work that way. The way you start working is driven by the way SS runs, so as a part of the control, let's say, my project is an insurance process. To increase the number of transactions, increase the number of applications processed per FTE,…I will look at putting in some improvements in place, as a part of SS one has to put in some dashboards in place. Not only this, a monitoring system has to be in place and a review mechanism also needs to be in place.*

4.3 HRM and flexibility of KI

Flexibility of KI not only requires deepening and updating of current knowledge bases but it also involves reconfiguring existing complementary knowledge to develop innovative products, processes and services through its internal and external knowledge

bases (Grant, 1996a). Our findings suggest that flexibility of KI can be enhanced

through the second order theme of *knowledge questioning values* (ability), *geographical

information and knowledge sharing* and dealing with *structural change* (opportunity).

4.3.1 *Knowledge questioning values, geographical information and knowledge sharing and structural change*

The first-order concepts of *quality, client, specific, error* and *process* (See Figure 5)

suggested that the larger organisations (e.g. A, E, F G and C) invested heavily in

induction programs that focused on knowledge questioning values (second-order

theme). Knowledge questioning values challenge status quo and untested business and

client assumptions. Such approaches involve adopting an open mind to questioning the

clients' theory-in-use and their business assumptions by demonstrating a superior

understanding of performative knowledge in one's area of expertise (Malik & Rowley,

2015; Malik et al., 2012; Sinkula et al., 1997). Such values often rely on informal

knowledge sharing, using prior and already established quality management and

performance metrics, thereby extending existing knowledge bases and searches for

complementary knowledge, at a within- and across-industry domains and functional

specialisations, from both, the clients' side and the MNC's global network of

subsidiaries. Developing a strong set cultural values was evident at Organisation G:

> *Whatever happens at Organisation G is right, whatever happens else it does not matter. We have a strong culture, and it is very important for people to integrate with this. I will call it like re-integrating with Organisation G, because everything that you do has a particular Organisation G way, and when you are talking to global teams, you have to follow certain Organisation G ways. You should have it else you are not adequately dedicated so whether it is conducting the virtual meeting or doing anything that need to follow on. People have to make sure things like timelines etc. This [culture] is a part of Organisation G, very, very Organisation G way.*

Finally, the first-order concepts of *process, knowledge, people, product, project,

organisation, change* and *particular,* suggest that for flexibility of KI, firms are sharing

geographical knowledge and information through structural changes (second-order

themes) across the network of operations of both Indian and global MNCs. The knowledge base of clients also complements the transfer and application of specialist knowledge from the network of subsidiaries. It is through a unique combination of both these types of knowledge that firms can renew, extend and reconfigure their knowledge bases to achieve flexibility of KI.

> *.... Organisation G had always believed and told the customer that 'megahertz is it'! The faster you [the processor] go, the better. From the processor mindset we are moving towards to platformisation paradigm where we are saying that faster need not necessarily be better. There is a need to understand what the customer wants; the customer is now telling us that we do not need to have speed, what is the cost, what is the power consumption, how compatible is this with other systems and what is my total cost of owning it [the processor]? This is the mindset change that R&D organisations need to capture in their approach to design and development. The second mindset change that has to come is that US is not the centre of universe, where 60 % of the work used to come from the US earlier, now it is likely to be more geographically dispersed.* **Head- Learning and Development (Org. G)**

5. Discussion, conclusion and implications

This study investigated the relationship between how HRM practices influence KI. Given the complexities associated with inter- and intra-firm coordination and cooperation, this study found firms develop a standardised and process-driven workflow design, which is typical of several knowledge-intensive firms (Malik et al., 2012; Malik & Rowley, 2015; Zollo & Winter, 2002). The critical mechanisms of direction, sequencing, and routines (Grant, 1996a) were in evident in the sample of firms. The presence of a bundle of AMO-enhancing HRM practices for achieving KI suggests that several socially complex and causally ambiguous resources and processes were supporting the application of knowledge. In line with earlier studies of HRM practices, investment in training (Cabrera & Cabrera, 2005; Chang et al., 2012; Haas & Hansen, 2007; Kang et al., 2007), focused hiring (Cabrera & Cabrera, 2005)

team-based designs (Hansen, 1999) information sharing between parent firm, clients and network partners (Hayton & Macchitella, 2013; Sinkula et al., 1997) and having a strategic approach to performance management (Swart & Kinnie 2003) was present in the sample and supported KI (Tell, 2013).

The unique and novel finding of this study lies in identifying a bundle of AMO-enhancing HRM practices for supporting the goals of KI. Specifically, three bundles of HRM practices enhance efficiency, scope and flexibility of KI. For example, KI goals of scope and flexibility were enriched by: novel work/organisational design and building a culture that values knowledge sharing and open-mindedness or knowledge-questioning values. We posit these HRM practices create an overall socio-cultural system that enables the formation of automatic routines for shared application of new and existing specialist knowledge. Through the promotion of organisational values of critical confrontation, cross-functional team sharing and learning, continuous learning, competence-based rewards and project-specific adherence to business specifications created a social and cultural context for developing organisational routines. This cultural context supported the scope and flexibility of KI.

Employing a novel organisational structure, which at its lowest level of task and knowledge, was organised around client-, project- and process-specific teamwork. Such an approach was logical not only because of client's contractual stipulations, but also to understand the knowledge of client's project-specific standard operating practices. The structure of teams was clustered around 'industries' (verticals or verticalisation as noted in the findings) and areas of specialisation (horizontals) — a vertical structure required domain-specific knowledge whereas horizontal structures needed specialist technical knowledge. Such structures seemed logical in the context of larger firms as it provided them with the opportunity to share, apply and integrate knowledge from the same vertical (e.g. banking sector) and specialisation (e.g. auditing) areas, to different client accounts in the same vertical

and specialisation (i.e. auditing in the banking sector). This structural design enriched the scope of knowledge integration. Further, work was designed to leverage new knowledge from different geographies by creating a structure by verticals and specialisations serving different set of industries and specialisations in a particular geography.

Such an approach developed context-specific knowledge and provided an opportunity to leverage specialist knowledge within the same vertical and horizontal as well as across different geographies. This approach improved flexibility of KI. In the context of large MNCs, knowledge transfer was also facilitated by the international HRM practices of expatriate assignments (Minbaeva, 2007). There was no support found for the differences in KI between inter- and intra-organisational firms. However, firms that had a more formalised and evolved workflow design and process methodologies (such as Organisations A, E, F and G), also had better AMO-enhancing HRM and work practices. As a consequence, they were able to achieve higher levels of KI, than the smaller and younger organisations (Organisations B, C and D). This finding is presented in Table 4.

In conclusion, in answering the first research question, eleven HRM practices variously impacted the key goals of KI (See Table 3). For the study's second question, the study found firms that did not have well-developed routines for standardisation of workflow and developing process-driven approach to project management (Organisations B, C and D) had poorly developed HRM practices (See Table 4). As such, this affected their ability to integrate knowledge. The findings also suggest that there were interactions between different AMO-enhancing HRM practices for integrating different types of specialist knowledge. The diversity of AMO-enhancing practices' impact on KI outcomes has implications for theory and practice. As the interdependence is high in this industry, managers must focus on not only the combined implementation of the above AMO-enhancing practices, they should also pay greater attention to how these practices are implemented.

The results also show that firms in the global IT industry can benefit from HRM designs that focus on developing standardised software competencies for delivering *efficiency* in integrating specialist and common knowledge through a common language and routines. This finding has implications for job design theories: logically ordering key tasks and determining their interdependency with other tasks, the nature of knowledge that is required, is critical for efficiency of KI. For example, in an offshore outsourcing context of IT firms, tasks are highly complex, uncertain and have higher levels of heterogeneity. As such, these tasks require greater streamlining for better coordination and cooperation for successful KI (Brusoni & Cassi, 2009; Carlie & Rebentisch, 2003; Grandori, 2001). Similarly, depending on the nature of knowledge: tacit or explicit, internal or external, shared or differentiated, related or unrelated, the extent of effort required and planning needed for KI will vary (Edmondson & Harvey, 2017; Dibiaggio, 2007). In other words, knowledge that is tacit, differentiated and unrelated often requires greater effort for its integration.

Managers can achieve *efficiency* and *scope of KI* through sequential and reciprocal interdependence, whereas for *flexibility* of KI, interactions between local and global teams is critical. Therefore, managers must continue to invest in process excellence to gain a better understanding of the workflow and knowledge of performance metrics relevant to client projects in a given area of specialisation and industry. This was borne out in the verticalisation of business structures. The above finding has implications for practice. Managers must promote the creation of social context that helps build strong social capital among the actors in a system. Increased levels of collaboration and interaction between employees and other groups facilitates KI, as does the development of a collective and shared identity of employees. The ability to form and access knowledge within and across networks is a critical aspect of design for effective KI. Therefore, it becomes imperative to manage key people who have strong ties in such networks as they have access to valuable specialist and

complementary knowledge. From a theoretical viewpoint, the conventional theories of network analysis and job design can benefit from an integrative understanding of the above network dynamics and how it supports KI. These symbolic artefacts encourages the development of a common language and therefore facilitates the ease with social, cultural and relational environment enables effective KI. Future research is needed on how different forms of social, organisational and professional identities and leadership and management styles can have a moderating effect on the goals and outcomes of KI.

6. Limitations and future research

Given the limited scope of this study (i.e. single industry and national context), future research can confirm the relationships outlined in this study's conceptual model by employing ex-post facto designs and longitudinal in-depth qualitative case studies. We note our findings are not be generalizable to the broader population but argue for its transferability to KI literature and believe it has some application within the global IT/BPO industry owing to some convergence in HRM and knowledge management practices through the use of standardised international quality management frameworks and software development protocols. Future studies could explore the relationships between micro-foundations of HRM, high-performance work systems and KI in different contexts, especially the relatively underexplored contexts of public service and social enterprises. Further, as the focus in this industry is on project teams, future research could focus on cross-border team dynamics and individuals in cross-functional teams, employing additional theoretical lens of power, trust and politics that are critical in extracting tacit specialist knowledge and integrating it to an organisation's productive function.

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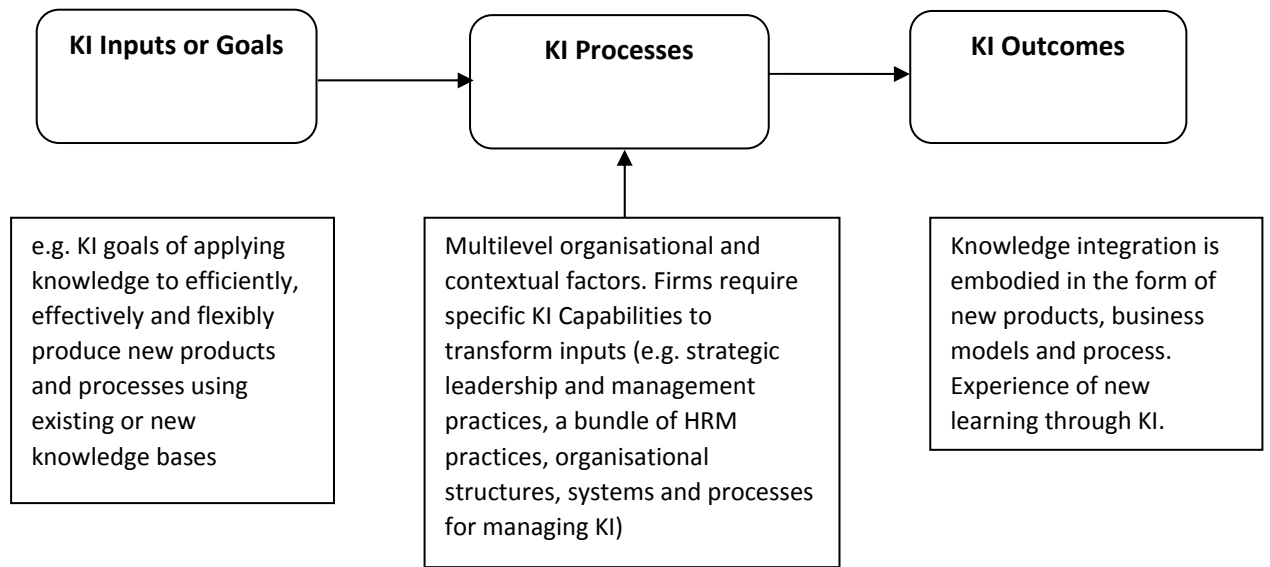
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Figure 1. A simple general systems model of knowledge integration

KI Inputs or Goals	KI Processes	KI Outcomes

| e.g. KI goals of applying knowledge to efficiently, effectively and flexibly produce new products and processes using existing or new knowledge bases | Multilevel organisational and contextual factors. Firms require specific KI Capabilities to transform inputs (e.g. strategic leadership and management practices, a bundle of HRM practices, organisational structures, systems and processes for managing KI) | Knowledge integration is embodied in the form of new products, business models and process. Experience of new learning through KI. |

Source: Adapted from Figure 1.1 Berggren et al., 2013 (p.8)

Figure 2. Conceptual model - A bundle of AMO-enhancing HRM practices influencing knowledge integration goals

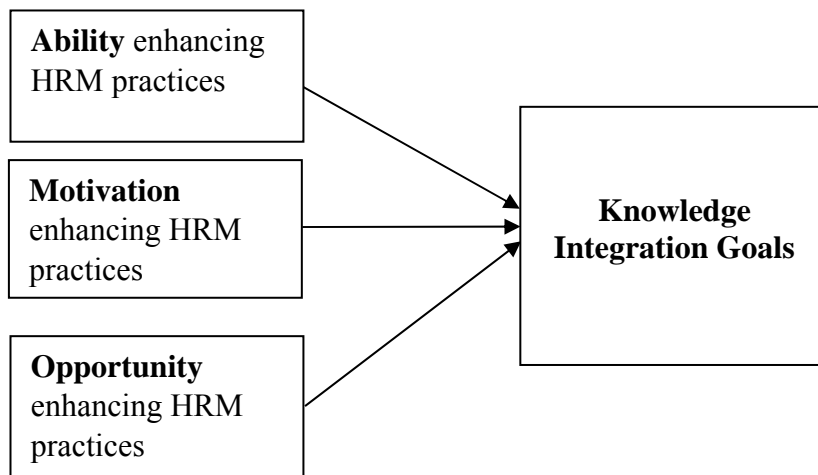| **Ability** enhancing HRM practices	
Motivation enhancing HRM practices	**Knowledge Integration Goals**
Opportunity enhancing HRM practices	

Figure 3. Visual map showing key themes and concepts
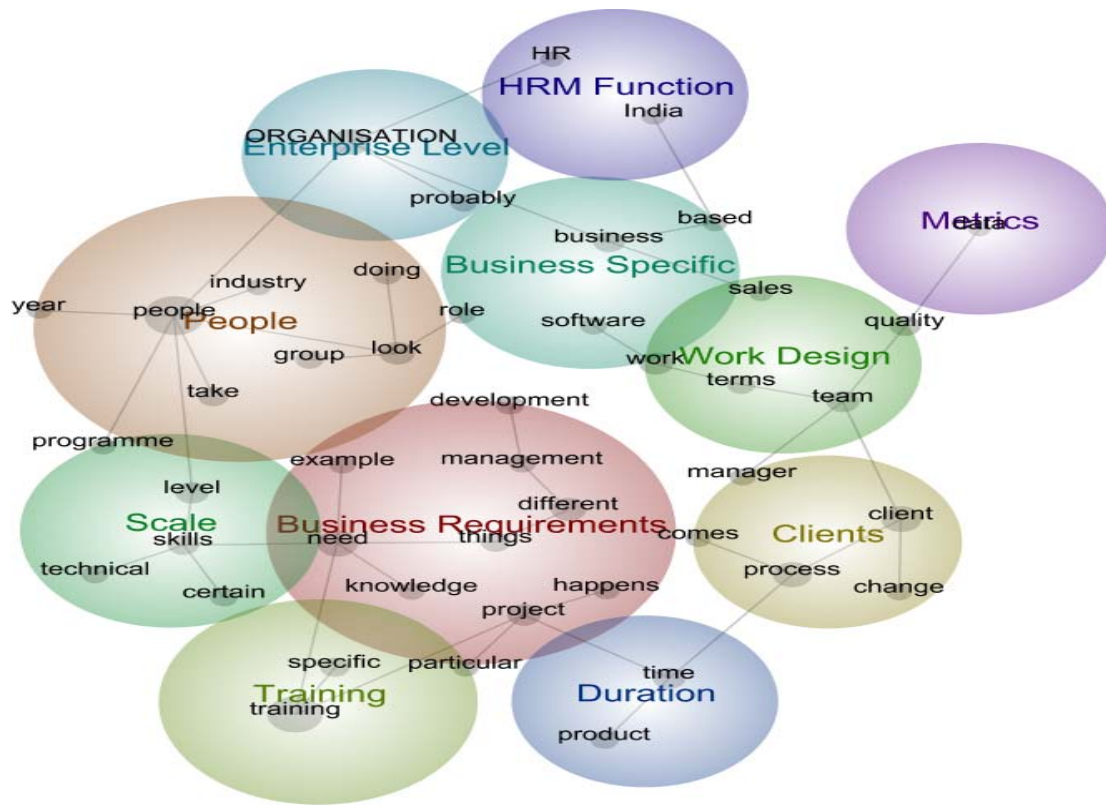
Figure 4. Mapping the relationship between knowledge and other concepts and themes
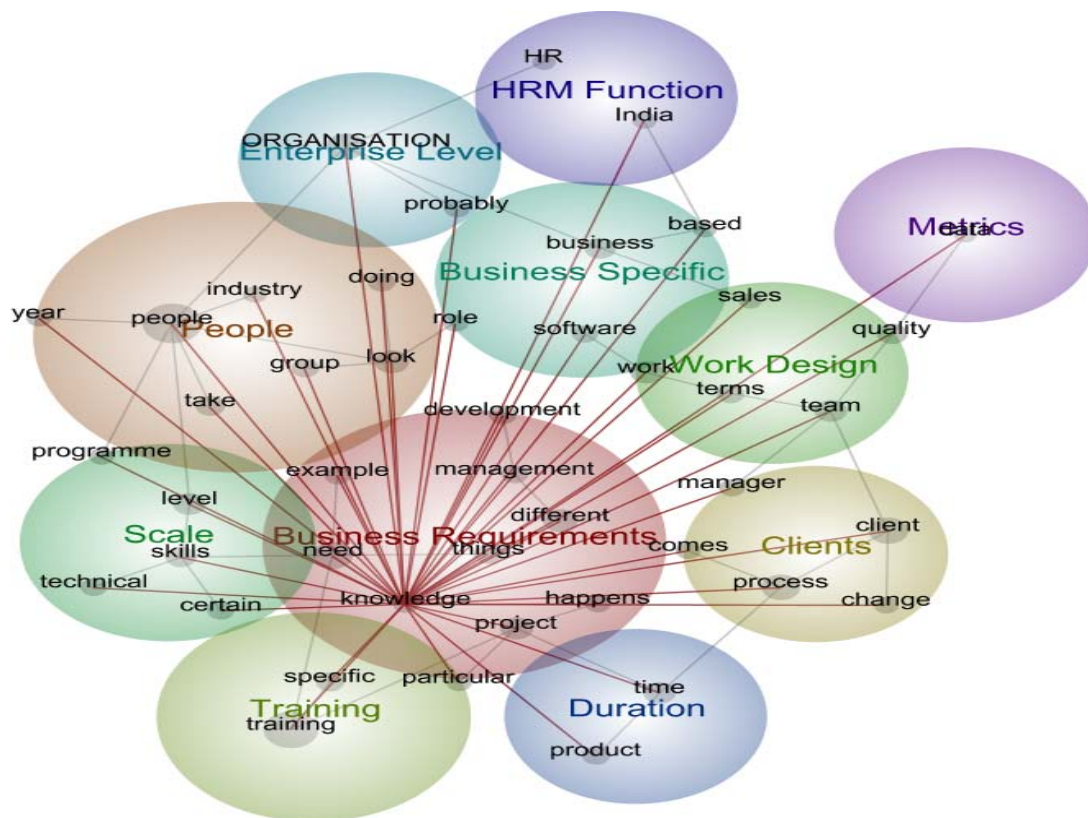
Table 1. Case organisations: A descriptive overview

Cases	Location	Ownership	Services
A	Gurgaon	US-MNC	Business process outsourcing (BPO)
B	Mumbai	Joint venture (India & US)	BPO & Knowledge process outsourcing (KPO)
C	Gurgaon	UK-MNC	BPO
D	New Delhi	Indian	BPO
E	Bangalore	US-MNC	IT-product and software services
F	Bangalore	Indian MNC	IT-product and software services
G	Bangalore	US-MNC	IT-product development

Table 2. Interviewee details

Case Name	CEO/ COO	HR Managers	Training Manager	Project Manager	Quality	Employ-ees	Business Develop-ment	Total
A		2	1	3	2	2		10
B		1	2	2	1	2		8
C	1	1	1	2	1	6	1	13
D	1*			2	1	6	1*	10
E		2		2	1	1		6
F		1	1	3	1			6
G		2	1	1	1	1		6

* Note: The CEO/COO was also the business development manager in small-sized firms

Table 3. Knowledge integration capability and main HRM and work practices

Knowledge integration goals	HRM and work practices	Enhances ability, motivation or opportunity
Efficiency	*Training and development*	Ability
	Focused hiring	Ability
	Competency-based performance management	Motivation
	Team working	Opportunity
Scope	*Project-based information dissemination*	Motivation
	Competency-based performance measurement	Motivation
	Information and knowledge sharing	Opportunity
	Verticalisation of business units	Opportunity
Flexibility	*Knowledge questioning values*	Ability
	Geographical information and knowledge sharing	Opportunity
	Structural change	Opportunity

Table 4. Nature and strength of HRM and work practices

HRM system	HRM and Work Practices	Organisation A	Organisation B	Organisation C	Organisation D	Organisation E	Organisation F	Organisation G
Ability	*Training and development*	High	Medium-High	Medium	Low	High	High	High
	Focused hiring	High	Medium-High	Medium-high	Low	High	High	High
	Knowledge questioning values	High	Medium-Low	Medium-High	Low	High	High	High
Motivation	*Project-specific performance*	High	Medium-Low	High	High	High	High	High
	Competency-based performance measurement	High	Medium	Medium	Low	High	High	High
	Project-based information dissemination	High	Medium	Medium	Low	High	High	High
	Information and knowledge sharing forums	High	Medium	Medium	Medium	High	High	High
Opportunity	*Team working*	High	Medium	Medium	Medium- High	Medium- High	High	High
	Information and knowledge sharing forums	High	Medium	Medium	Medium	High	High	High
	Verticalisation	High	Medium	Medium	Low	High	High	High
	Geographical Information and knowledge sharing	High	Low	Low	Low	High	High	High
	Structural change	High	High	Medium	High	High	High	High

Table 5. Linking automated concepts and themes with theoretical codes data excerpts

First order concepts	Relevant automated theme(s)	Additional quotes for supporting second order themes	Second order themes
Efficiency of KI			
Training, people, person, skills, job, knowledge, time	Training Scale People Duration	*[Training] Not only in the product line but [also] on the basis of the kind of programming we have and we're looking at …product specific training for a month or so.* *This is over and above the 5-7% that we spend on training. After that also, we have a regular training, so then the client comes here with the product knowledge, it is like a train-the-trainer programme.* *That is how their hiring strategy works- Right qualification, aptitude and skills and then they and mould them into Organisation G specific requirements. Focussed level of interaction between very highly experienced professionals who have specialised Organisation G [specific] knowledge and are in the US train teams in India and help them build the expertise.*	**Ability-enhancing Practices** Training & development and focused hiring
Business, work-specific, process, product, things, skills, knowledge, role and quality	Metrics HRM function Scale Business specific	*They have tools to define. They have metrics, they have the data which is coming out of the quality from various projects, so the first role of quality is to look at the process looking at the variance and from what they find where there should be changed and look at what should, where should, what modifications should happen to the process.* *Here we have what's called competencies for example Sybase skills, they are all one competency, SAP, Siebel, Oracle, Bann etc, all this comes under packaged skills. On other side, we have custom applications like …data warehousing, mainframe, AS400 and testing, …these things don't exactly come under the packaged skills, they are part of custom applications.* *So first, what is your quality score, the second thing is what is the kind of company you have covered, which category have you covered; we divide [this] into three categories A, B and C. A is for the toughest slot with large volumes of data, B being somewhere lying inbetween and C is probably which dosen't report so much of data. Then …the time that you have taken to do that work and then …performance is evaluated.*	**Motivation-enhancing Practice** Competency-based performance management
People, teams, organisation, group, processes, knowledge, project, doing and happens	Work design People	*As a top performer of the XYZ process, I was given the opportunity to grow within the organisation – from sales to business development. We have access to databases, which we use for setting up meetings with the client and our business team based out of UK.* *Silo mentality is going slowly. No silo business; it is teamwork–that is happening.* *So, for that, typically, teams have got 2 quality management executives attached, and these people bring with them process level knowledge, because they worked for a year and they know exactly, how does it happen and what are the difficulties that people face…*	**Opportunity-enhancing Practice** Team working
Scope of KI			
Project-specific, particular, examples, different,	HRM function Metrics Business	*So, not a lot of product or even project companies have this kind of environment conducive to learn …we go to the knowledge shop and look at what kind of projects have been there or you go and look at the CBD which are available just sharing this with e-learning, library.* *We have people aligned to these competencies… but end of the day every single employee in the BFSI vertical today are attached to one of these competencies. Organisation E's internal services group …they are all attached to these competencies*	**Motivation-enhancing Practices** Project-based

process, technical, and knowledge	specific Duration	*and we track every training by competencies...* *So, today in the role with organisation, we have defined roles and, we have defined competencies for that role of either you have it or you do not ...or you are in the middle of it....*	information dissemination & competency-based performance measurement
Different, knowledge, people, product, project, organisation, change, and particular	Organisation Clients People Business requirements Work design	*For example the research group that has been set up there isn't a central training competency, most of the things, like in business and knowledge sharing happens here.* *Team leader skills are important; you cannot find everyone in the market, so you have to develop your own people continuously. ...I can show you that the type of people we need for different verticals will be very different, hence the knowledge that you get within the training team is very diverse tremendous domain knowledge.* *So now what it means is now we have to invest in capability development in your vertical how do you develop consulting expertise and experience and this is a very different games than saying, " I do not care what kind of customer you are". These are all the different services we offer and that is how we work.*	**Opportunity-enhancing Practices** Information & knowledge sharing and verticalisation of business
Flexibility of KI			
Quality, client, specific, error and process	Clients Business specific	*so we do challenge, lot of times we challenge why do we need people with so and so skills and people challenge, it happens all that.* *Database captures the errors and performance of agents and clients and accordingly the information gets updated and challenged. We also keep in touch with news and tele media to see what the issues are with any of the products and sometimes do take it up with the company.* *The technology that we have to put in continuously changes and the clients may not be very savvy on the technology. What they would probably have is their consultants who will advise them and our consultants on the kinds of technologies that they would want*	**Ability-enhancing Practice** Knowledge questioning values
Process, knowledge, people, product, project, organisation, change, and particular	Clients Business requirements	*I can show you that the type of people we need for different verticals will be very different, hence the knowledge that you get within the training team is very diverse... tremendous domain knowledge.* *I think this is one industry that gives people the opportunity to try out different things and allows you to experiment extremes.*	**Opportunity-enhancing Practices** Geographical information and knowledge sharing & structural change

Figure 5. Analysis of data structure

First-Order Categories/Concepts	Second-Order Themes (Theoretical Themes)	Aggregate Dimensions (Theoretical)
Training, people, person, skills, job, knowledge and time	**Ability-enhancing Practices** Training & development and focused hiring	Efficiency of Knowledge Integration
Business, work, specific, process, product things, skills, knowledge, role and quality	**Motivation-enhancing Practice** Competency-based performance management	
People, teams, organisation, group, processes, knowledge, project, doing and happens	**Opportunity-enhancing Practice** Team working	
Project-specific, particular, examples, different, process, technical, and knowledge	**Motivation-enhancing Practices** Project-based information dissemination & competency-based performance measurement	Scope of Knowledge Integration
Different, knowledge, people, product, project, organisation, change, and particular	**Opportunity-enhancing Practices** Information & knowledge sharing and verticalisation of business	
Quality, client, specific, error and process	**Ability-enhancing Practice** Knowledge questioning values	Flexibility of Knowledge Integration
Process, knowledge, people, product, project, organisation, change, and particular	**Opportunity-enhancing Practices** Geographical information and knowledge sharing & structural change	

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