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KNOWLEDGE MANAGEMENT GOVERNANCE IN MULTINATIONAL COMPANIES: A CASE STUDY OF SIEMENS

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Abstract

Managing knowledge in multinational companies (MNCs) has been of critical importance not only because of the need to overcome the ever-present competition in globalised market, but also due to the need to tap local knowledge and diffuse global knowledge. Global presence for MNCs means an opportunity to learn from local markets, exploit worldwide experiences, and induce innovation. It is only through globally effective management of knowledge that such opportunity can be realised. A deliberate knowledge management (KM) strategy needs to be incorporated along with relevant governance mechanisms to ensure KM benefit realisation. This paper examines how the governance of KM can lead to successful KM implementation particularly in an MNC. Through a case study of Siemens based on secondary data, it is argued that KM governance evolves towards changes in KM strategy to ensure that KM benefits are realised. While the enablers of successful KM have been discussed in the literature, little research has been done in examining how governance mechanisms assist in realising KM benefits in a multinational setting. The paper suggests that cross-cultural management and a relevant approach to incentive schemes are critical in considering how KM governance can lead to successful KM implementation in MNCs.

Keywords: knowledge governance, knowledge management, multinational companies, Siemens.

1 INTRODUCTION

Knowledge has long been regarded as the most critical asset for an organization. In an international business setting, where competition spreads globally, the role of knowledge as a strategic asset has become even more critical. Globalization and the dynamics of the business environment have necessitated cross-border enterprises to capitalise on their diversified knowledge base in order to attain desirable growth and profitability level (Zaragoza-Saez, Claver-Cortes, & Quer-Ramon, 2009).

Having realised the importance of knowledge, many multinational companies (MNCs) have undertaken deliberate attempts to effectively create, capture, retain and utilize knowledge. From the early 1990s, several large MNCs were among the first organisations to deploy knowledge management initiatives (Powers, 2006; Rollo & Clarke, 2001; Volpel, Dous, Brenner, & Kolbe, 2007). The global presence of the company was no longer seen as simply exploiting new markets and pursuing cost efficiency. It was an opportunity to diffuse best practices amongst the various locations. Furthermore, the dispersed locations of the company means a chance to learn from local markets, and exploit knowledge globally towards innovation and growth (Bartlett, Ghoshal, & Birkinshaw, 2004).

To best achieve the desired business performance, managing knowledge should be undertaken explicitly and deliberately. When there is no formal knowledge management (KM) approach, organizations are likely to suffer from vague benefit realization, and are unlikely to meet their business objectives (Zyngier & Burstein, 2004). KM is largely a business venture, which aims to leverage knowledge through the deployment of KM processes and facilitating technologies (McDermott, 1999). Therefore, there must be a deliberate framework outlining how business goals are to be achieved through KM. In addition to a deliberate KM strategy, there needs to be a mechanism that ensures the delivery of KM expected benefits. It should provide feedback channels, which can inform whether the implementation of KM strategy is leading to the desired state. This indicates the need for governance in the implementation of KM strategy. Governance of KM provides the mechanism of pre-emptive controls, which manifest in an executive framework to inform the decision making process in KM (Zyngier, Burstein, & McKay, 2004).

In a multinational setting, cultural difference between headquarters and subsidiaries distinguishes KM practice in cross-border enterprises as opposed to single-country companies (Paik & Choi, 2005). As Ang and Massingham (2007) explain, there are different scenarios for the deployment of KM initiatives in an MNC, involving either standardization across business units, or adaptation by local subsidiaries. This implies that there are differences in terms of controls and authorization of a KM initiative between headquarters and subsidiaries. Thus, examining how KM governance appears in this situation will aid understanding of factors contributing to the successful implementation of global KM.

This paper investigates the practice of KM governance in multinational companies, particularly its role in ensuring the delivery of KM benefits across different countries. Through a case study of KM in Siemens, a large MNC known for its reputation in pioneering successful KM initiatives, the role played by KM governance in leading the fulfilment of KM goals throughout different countries is demonstrated. With secondary data being used in the case study, transitional changes throughout different periods of deployment are also highlighted.

2 LITERATURE REVIEW

2.1 Knowledge and knowledge management

Knowledge is multifaceted and thus may not easily be defined. There are many different views on the concept of knowledge. Researchers use various metaphors to define knowledge and its operationalisation in the context of knowledge management (Andriessen, 2008). Some favour viewing ‘knowledge as stuff’, whereas others see ‘knowledge as thoughts’ or ‘knowledge as feelings’ as more compelling. These various metaphors represent the notion of interpretation and meaning that knowledge is associated with. In addition, Alavi and Leidner (2001) demonstrate the various lenses

that can be used in examining the nature of knowledge. It is argued that the adoption of a particular lens affects the perceived operationalisation of knowledge. If knowledge is considered as an object, for example, leveraging knowledge will primarily focus on managing and transferring knowledge stocks. In contrast, if knowledge is seen as a process, it will then involve optimisation of knowledge flows, and sustaining of knowledge processes. When knowledge is managed as a process towards enhancing capability, it implies the capitalisation of information, learning and experience, into an ability to improve best practice (Earl, 2001). This notion highlights the relevance of knowledge to an organisation for driving its innovation and effectiveness.

KM can be described as a deliberate attempt to utilise knowledge assets in order to realise value and achieve organisational objectives (Stewart, et al., 2000). Wiig (1997) claims that KM acknowledges the potential control that an entity has over applying its knowledge assets. KM is regarded as a business approach which extends the use of technology as an enabler (Gray & Meister, 2003; Zyngier, 2003). Technology is installed in KM to help improve access to knowledge as well as proliferate knowledge for strategic use (Alavi & Leidner, 2001; McDermott, 1999). Taken as a whole, knowledge management is the overall process deployed by an organisation to exploit its knowledge (Burstein & Linger, 2006).

2.2 Knowledge management and MNCs

Given the networked nature of MNCs, there are different applications of knowledge that do not apply to single-site companies. The notion of knowledge transfer, for example, is far more intricate within MNCs as opposed to non-MNCs. Within MNCs, flows of knowledge are convoluted due to multiple organisation layers, dispersed geographical locations, and diverse cultural values. Knowledge transfer in an MNC is unique as it employs multichannel transmission, complex infrastructure and various knowledge conversion modes to facilitate effective knowledge sharing intra-organisationally (Chini, 2004). Desouza and Evaristo (2003) point out that knowledge processes in MNCs involve tension between headquarters and subsidiaries, and amongst the subsidiaries themselves. With respect to creating enduring value for organisation, knowledge processes referred to include knowledge creation, capture, organisation, sharing, and utilisation (Becerra-Fernandez, Gonzalez, & Sabherwal, 2004; Gold, Malhotra, & Segars, 2001). MNCs distinctively have multiple instances of knowledge creation as their operations span widely across countries (Bartlett & Ghoshal, 1998). This entails the necessity of integrating knowledge capture processes and ensuring consistent organisation throughout host countries.

For organisations to leverage knowledge effectively, they should sustain a full chain of knowledge processes consisting of creation, storage, distribution and application (Shin, Holden, & Schmidt, 2001). The notion of knowledge storage, for example, involves customisation within organisational memory, which is critical in the provision of access to knowledge reuse (Chini, 2004). While effective knowledge creation and transfer in MNCs have attracted considerable research (Foss & Pedersen, 2004; Gupta & Govindarajan, 2000), little research has been done to address how managing knowledge is realised for value-added processes. That said, how MNCs organise and utilise the knowledge disseminated throughout their business units also need to be considered. In this regard, different organisational structures, cultures, and authority and role distribution patterns lead to different characteristics of managing knowledge in MNCs (Nielsen & Michailova, 2007).

2.3 Knowledge management governance

KM governance is the implementation of decision rights and responsibility through control and feedback mechanisms to ensure the delivery of KM benefits (Zyngier, Burstein, & McKay, 2006). Onions and de Langen (2006) suggest KM governance as a string of input, process, and output which functions to ensure the attainment of KM performance standards. Schroeder, et al. (2007) argue that the framework of KM governance includes organisational structure, process, and relational mechanisms—as a basis for explaining how structure and process in organisations can be honed to support coordination activities in KM deployment. While Schroeder, et al. (2007) offer a pragmatic view of the exercise of KM governance, Zyngier, et al. (2006) suggest KM governance aspects in

relation to KM strategy. Their aspects of KM governance include: authority, risk management, strategy development, organisational culture, and evaluation and measurement.

The governance aspect in authority means rules and exercise of authority are subject to good practices. Authority is the exercise of power legitimately mandated in an organisation. It is expected to occur in an organisation based on the position or rank one has (Zyngier & Burstein, 2004). While leadership relates to the role of individuals and teams (Burstein, Sohal, Zyngier, & Sohal, 2010), authority is a manifestation of power that emerges from legitimate rank and position in an organisation. In the case of an MNC, Zaragoza-Saez et al. (2009) reveal that leadership and level of autonomy contribute to the effective knowledge creation and transfer intra-MNC.

KM is not immune to the risk of failure and thus requires proper risk management. Zyngier (2008) describes risk management as a control mechanism and feedback loop for KM strategy. It provides analysis and monitoring of KM strategy, and promotes iterative improvement toward KM strategy. With respect to MNCs, KM strategy is strongly affected by the adoption of business strategy. This is particularly related to the exertion of control over networked units of MNCs (Desouza & Evaristo, 2003) and the diversified knowledge base they have.

KM strategy development pertains to the processes and mechanisms which guide the development of KM strategy in an organisation. This translates into the identification of roles and responsibilities for developing and executing KM strategy (Ionescu, Burstein, & Zyngier, 2006). In the case of an MNC, the control nexus between headquarters and subsidiaries impacts on how KM strategy is developed. Desouza and Evaristo (2003) illustrate the development of KM strategy in MNCs with three categories: (1) headquarter commissioned and executed; (2) headquarter commissioned and regionally executed; and (3) regionally commissioned and locally executed.

Organisational culture is the environment in which resources used to achieve an organisation's objectives is leveraged. Zyngier and Burstein (2004) claim that leaders create organisational culture by leading their staff towards collective improvement and exemplifying the expected attitude in the organisation environment. The culture itself can be in the form of corporate values, professional attitude, ethical conduct, or simply a positive climate to foster collaboration and task achievement (Hofstede, 1997). Leidner and Kayworth (2006) examine how cultural conflicts may emerge in different levels such as group, organisational, and national. Further, they argue that cultural conflicts in IT adoption, including KM systems, can stem from the different perceptions of values which result in system conflict, contribution conflict, and vision conflict. As Paik and Choi (2005) point out, national language and traditional values can be obstacles to the global implementation of KM systems in MNCs. National culture is also argued to significantly influence the adaptation of organisational culture (Ang & Massingham, 2007). Pauleen (2007) explores the relationships between national culture, organisational culture, and individual behaviours. He argues that national culture may impact individual behaviour directly and indirectly through the mediation of organisational culture. Therefore, organisational culture may vary in MNCs due to its various encounters with the traditional values of individuals.

As an iterative process of control, KM governance stimulates refinement of KM strategy through the mechanism of evaluation and measurement (Zyngier, et al., 2006). Onions and de Langen (2006) argue that evaluation and measurement are parts of KM governance that perform the function of performance management in KM. The two arguments differ in their level of operationalisation, but both convey the imperative of evaluation and measurement as a governance aspect.

3 METHODOLOGY

The study adapted the KM governance framework of Zyngier (2006), which includes authority, strategy development, organisational culture, risk management, and evaluation and measurement as governance aspects. The selection of this framework is based upon the role of KM governance in realising the KM benefits that the framework suggests. It illustrates KM governance as a means to lead KM strategy. This is an aspect not brought out in other frameworks such as those of Onions and de Langen (2006) and Schroeder, et al. (2007). In analysing secondary data, semantic analysis was

undertaken of the texts presenting the case studies. The semantic analysis was further translated into analytical questions which encompassed the KM governance framework. Table 1 illustrates the analytical questions derived from the KM governance framework.

Governance aspects	Analytical questions	Focus of governance activities
Authority	• Who are the governing bodies in KM? • What roles does the KM leadership have?	• Ensuring adequate leadership to sustain the KM program • Developing an appropriate framework of decision rights (regulation, supervision)
Strategy development	• Who are the responsible parties involved in developing KM strategy? • Who is responsible for executing KM strategy worldwide? • What are the considerations in developing global KM strategy? • What are the methods and tools used to identify KM goals and align them with KM components (people, process, technology)?	Developing strategic alignment over knowledge processes, technologies, and people (supervision, revision)
Organisational culture	• What are the organisation values available to support KM strategy? • How is organisation culture incorporated worldwide? What are the impacts of national culture? • What are the facilitating processes to deliver KM strategy toward benefit realisation?	Devising and nurturing a supportive organisation culture (examination, supervision)
Risk management	• What are the anticipated risks of KM implementation worldwide? • What are the attempts to mitigate those risks?	Maintaining adequate plans to identify and mitigate risk of KM (examination, regulation, revision)
Evaluation and measurement	• What are the evaluation and measurement systems included in the KM initiative? • What are the mechanisms to provide feedback concerning KM strategy?	• Developing an appropriate framework for performance measurement of KM • Developing appropriate channels and mechanisms for feedback concerning KM strategy (examination, supervision, revision)

Table 1. Analytical questions for semantic analysis.

In this study, Siemens was selected as an appropriate case study for investigation based on its recognised performance on criteria such as reputable KM initiatives, relevant business strategies, variety of geographical locations, high-level KM technology advances, knowledge-intensive business sectors, and leading market positions. Siemens has been renowned for its excellence in implementing KM since the 1990s, as shown by the global recognition of its outstanding performance in delivering a knowledge-driven culture and maximising enterprise intellectual capital (Chase, 2009).

The study employed secondary data sourced from corporate documents, corporate slides, books, journal articles, conference papers, and other publicly available data, as shown in Table 2.

Author	Data year	Summary	Type of document
Davenport & Probst, 2002b	1998 - 2002	A compilation of case studies of KM in Siemens, from its inception in 1998 to 2002, exploring KM practices in Siemens' diverse business units	Edited book
MacCormack, Herman, & Volpel, 2002	1998 - 2002	A case study on the implementation of ShareNet in Siemens globally	Case study report

Author	Data year	Summary	Type of document
Knowledge Board, 2002	2002	Brief analysis on the challenges of Siemens' ShareNet	Electronic article
Goller, Kleiber, & Schoen, 2002	2002	Report on knowledge management approaches in Siemens pertaining to e-business	Case study report
Gibbert, Jenzowsky, Jonczyk, Thiel, & Volpel, 2002	2002	Case study report of Siemens' ShareNet particularly in regard to its initial stage	Book section
Kugel, 2003	2003	The challenge in Siemens' ShareNet and its extension toward PeopleShareNet, the people exchange initiative	Company slides
Saphorster, 2004	2002	Brief report on the state and expected development area of Siemens' ShareNet as of 2002	Company whitepaper
Muller, Baumann, Manuth, & Meinert, 2004	1998 - 2003	Case study report on Siemens' ShareNetits expansion to the R&D department	Conference paper
Volpel, Dous, & Davenport, 2005	1998 - 2002	Case study report outlining the insights taken from the success of Siemens' ShareNet globally	Journal article
Ciabuschi, 2005	1999 - 2003	Analysis of IT solutions used as part of KM solutions in Siemens' ShareNet.	Journal article
Volpel & Han, 2005	1998 - 2002	Analysis of the cultural discrepancies that emerged from the implementation of Siemens' ShareNet in China	Journal article
Heier, Borgman, & Manuth, 2005	1998 - 2003	Analysis of the initiation of Siemens' ShareNet as well as its expansion to the R&D department	Book chapter
Nielsen & Michailova, 2007	1998 - 2006	Analysis and comparison of the typology of KM systems in MNCs, with a section containing a discussion of KM in Siemens	Journal article
Volpel, et al., 2007	1998 - 2002	Case study report on the development of Siemens' ShareNet	Journal article
Muller, 2007	2005 - 2007	Analysis of the development of References@SBT, a KM initiative under Siemens Building Technologies	Conference paper
Siemens, 2009	2009	Annual report outlining the financial and business performance of Siemens for the year ended 2009	Company report
Muller, et al., 2009	2005 - 2009	Current progress of References@SBT which includes the development of social networking tools within the system	Conference paper
Gibbert, Probst, & Davenport, 2010	2000 - 2002	Analysis of the lessons learned from Siemens' ShareNet, particularly in avoiding implementation traps and failure traps	Journal article
Stocker & Müller, 2010	2005 - 2009	Recent state and development of microblogging within References@SBT	Published paper

Table 2. Data sources for Siemens' KM deployment.

With the use of data from secondary sources, there were possibilities that the data was inconclusive due to different focus of the data. The study also exposed to the risk of outdated information. However, this was minimised by taking into account the longitudinal perspective, 1998 – 2009, while carrying out data collection and analysis. In the study, the secondary data presented by earlier authors was re-examined based on the framework and analytical questions to draw implications for practice.

4 THE CASE STUDY: SIEMENS

4.1 Organizational background

Siemens is a leading company which promotes itself as a global powerhouse in electronic and electrical engineering (Siemens, 2009). Its major areas of business include energy, healthcare,

industrial productivity and intelligent infrastructure solutions (MacCormack, et al., 2002). Following its worldwide operation, responsibilities and managerial roles in Siemens were organised into three major regions (MacCormack, et al., 2002). One region consisted of Europe, Africa, and Middle East. The other regions were the Americas and Asia including Australia. Siemens' corporate governance structure included the Supervisory and Managing Board as required by the German Stock Corporation Law (Siemens, 2009). Further, the Managing Board was responsible for conducting top management activities across different divisions worldwide (Siemens, 2009).This suggested that the reporting structure followed a decentralised structure (MacCormack, et al., 2002). This meant that each division was independent from other divisions in terms of managerial and operational role although sharing a similar reporting structure towards headquarters (Davenport & Probst, 2002b).

4.2 KM initiatives in Siemens

In 1998, the first KM system, named ShareNet, was launched within Siemens' largest business division, Information and Communication Network (ICN), and only included Sales and Marketing functions in its scope (MacCormack, et al., 2002). This was one of Siemens' early KM initiatives. It was initiated by the CEO of the ICN Group in collaboration with the Business Transformation Partners (BTP) (MacCormack, et al., 2002). Other than ShareNet, numerous other KM initiatives had proliferated in Siemens business units. These included e-learning, communities of practice, and replication of knowledge during mergers and acquisitions (Davenport & Probst, 2002a). Over time, ShareNet evolved to incorporate mobile-based systems, and was connected with other systems such as document management systems and e-learning applications (Volpel, et al., 2005). These contributed to the transformation of Siemens' value chain processes to embrace an e-business model (Ciabuschi, 2005).

The development of KM initiatives in Siemens over time can be illustrated in a timeline of major events as follows.

- 1998
  - The first KM initiative in Siemens' ICN Division called ShareNet was established.
  - Communities of practice in KM emerged.
- 1999
  - The corporate KM program was established.
- 2002
  - Budget cutting in KM due to Siemens' decline in market share caused by the collapse of the global telecom industry.
  - Expansion of ShareNet into PeopleShareNet which included mobilising people in addition to knowledge sharing through intranet portals.
- 2004
  - Extended scope of ShareNet to include the R&D function.
- 2008
  - KM began to embrace social media and social networking tools.
  - The first in-house social networking tools embedded within References@SBT, a KM system within Siemens' Building Technologies, was incorporated.

5 FINDINGS

Earlier KM deployment in Siemens was marked by the implementation of ShareNet as was shown by the high number of references to ShareNet to date. While ShareNet has remained the most widely spread KM system in Siemens, more recent KM initiatives in Siemens saw the development of KM to include a wider variety of KM systems and tools. This encompassed the incorporation of social networking tools in 2008 as part of the enabling technology for KM. There was a distinguishable pattern of KM strategy between the years prior to, and after, 2008. The distinction mainly lies in the focus of KM in which from 1998 – 2007 witnessed knowledge reuse through sharing best practices as the main paradigm of KM in Siemens (Gibbert & Krause, 2002). In contrast, current Siemens' KM initiatives reveal a stronger focus on collaborative performance and improving access to expertise and

people (Stocker & Müller, 2010). The transition of KM strategy into focusing KM on collaborative performance was noticeable when social networking technology was incorporated into KM systems. With this, KM governance practice in Siemens evolved in order to cope with changes in KM strategy. In order to delineate how KM governance in Siemens evolved, the findings of each governance aspect are organised into two different periods, i.e., the years prior to, and after, 2008.

Detailed findings on the practice of KM governance in Siemens are indicated in Table 3.

Governance aspect	1998 – 2007	2008 onwards
Authority	• Decentralised structure of organisation • Corporate KM was located under the auspices of the CKO • Strategic direction of KM systems was provided through considering inputs from local offices • Local KM managers were present to help socialise KM • Global content editors were present in moderating knowledge objects • The largest KM system, ShareNet, was located in the head office but governance structure extended to include inputs and decision making from business units	• Business units had the authority to set up their own KM systems despite the common KM platform,ShareNet • In Siemens Building Technology, the use of enterprise 2.0, e.g. microblog, wikis, has been initiated bottom-up and then adopted globally in that business unit • Decentralised KM was evident from the development of References@SBT as an individual KM system apart from ShareNet
Strategy development	• Knowledge as an asset • Focus was on sharing best practices • Codification strategy was used to elicit tacit knowledge in the KM system • Typical technologies used were expert directory, discussion forums, intranet, knowledge portals, knowledge library • Supports toward communities of practice were present	• Greater focus of KM on people as shown by the extension of ShareNet into PeopleShareNet • Staff were mobilised worldwide through assignments based on identified knowledge base • Enterprise 2.0 began to emerge and partially implemented in one business unit with global branches
Organisational culture	• Cultural difference emerged in adoption of KM systems with particular issues in China and India. • There was also cultural difference in motivational factors in sharing knowledge • Incentive schemes in the form of both financial and non-financial rewards were introduced to encourage participation	• Sharing of best practice was still the common theme of the organisational culture • In case of enterprise 2.0 in the business unit, participation was voluntary and reward scheme was only introduced in the initial adoption phase. Reward was seen intrinsically through the social experience introduced by the software adoption
Risk management	• Local business units were involved in ShareNet strategic development to address the risk of non-conformance with users' needs • External threat in form of dynamic business environment was recognised to adjust KM system strategic direction	• Given the infancy of the enterprise 2.0 adoption, risks of negative responses from other users were acknowledged and were under research by the business unit
Evaluation and measurement	• Quantitative measurement was used to evaluate the state of contribution into KM systems	• Early stage of evaluation and measurement of communities of practice was underway • In the case of enterprise 2.0, a pilot study was done to evaluate the perceived impact by the users

Table 3. KM governance practice in Siemens.

5.1 Authority

The establishment of KM in Siemens began through a bottom-up approach, as was shown in the development of communities of practice in Siemens (Enkel, Heinold, Hofer-Alfeis, & Wicki, 2002). Siemens' KM reflected a high-level of autonomy around its subsidiaries. This was evident from the existence of multiple KM programs throughout Siemens' business units, e.g., Know-How Exchange, KN Service Knowledge, and Knowledge Motion (Davenport & Probst, 2002b). Nevertheless, ShareNet was the largest KM program as it was set up in the largest division of Siemens worldwide, the Information and Communication Network (ICN). In ShareNet, decentralisation was visible through the involvement of selected local subsidiaries throughout the development of ShareNet. The KM system was organised in head office, while the governance structure extended to include subsidiaries in the decision making role. Local ShareNet managers also had the authority to moderate knowledge inflows into the KM system (MacCormack, et al., 2002).

> *"For compensation, visibility and expert recognition, invitation to high-level events, end integration with business processes, for example employee target agreements, were planned. However, most decisions were neither taken nor implemented since Siemens' decentralized matrix structure required such decisions from local companies and not from Siemens ICN's executive management (Heier, et al., 2005, pp. 382)."*

In relation to the current implementation of authority in Siemens' KM, decentralisation is still a dominant theme. The fact that Siemens Building Technologies (SBT) built its own KM system, References@SBT, apart from the corporate-wide initiative shows the high degree of autonomy it had. In the development References@SBT, users' inputs were included to encompass a local/subsidiary perspective in the governance structure (Muller, 2007). This relatively recent addition of KM programs included social networking tools as a means of collaboration. The decision to embrace such technology was made bottom-up, based on the inputs from the user community in the subsidiaries (Muller, et al., 2009).

5.2 KM strategy development

From a KM strategy development perspective, the initial phase of KM in Siemens saw a strong focus on knowledge reuse through sharing best practices (Gibbert & Krause, 2002). ShareNet was intended to help find the knowledge and best practices needed and reuse them to perform particular tasks.

> *"The basic idea [of ShareNet] is that knowledge created somewhere in the world should be made available for global reuse. Com ShareNet intends to network all local solution efforts to facilitate cooperative global learning, local reuse of global best practices, and the creation of global solution competences (Muller, et al., 2004, p. 1)."*

From 2008, Siemens has included the development of enterprise social software as part of its KM strategy development. This development was driven by external factors such as the growing informal use of social networking tools (microblogging services) within the communities. This emerging adoption of social software in Siemens showed the transition in Siemens KM, from primarily connecting people-to-content, to currently including connecting people-to-people.

5.3 Organisational culture

As part of building the organisational culture, several incentive schemes were introduced both financially and non-financially to encourage high user participation in using ShareNet from around the period of 1999 – 2003 (MacCormack, et al., 2002). Among these was Bonus-on-Top which entailed financial bonus and reward schemes in form of mileage (Volpel, et al., 2007). As noted in Volpel, et al. (2005), cultural problems arose in India. The incentives in forms of gifts were traded outside the company for an employee's personal benefit. Likewise, China witnessed cultural bias in terms of participation when English language was found as a barrier to sharing knowledge and caused a low level of participation (Volpel & Han, 2005). The employees in China were reluctant to participate freely due to their traditional beliefs.

> *"The Chinese culture strongly emphasizes "face saving," thus employees who are highly sensitive in respect of "face saving" and feel insecure with their ability to write English, are reluctant to make contributions. They are afraid that grammar and spelling mistakes can harm their "face" in the company (Volpel & Han, 2005, pp. 59)."*

In terms of participation within ShareNet, different motivational factors emerged. While financial incentives culturally remained the strong motivation factor in India, they were not perceived as equal in China. The ShareNet users in China felt that the material rewards were not the main driver to participate, particularly when referring to the spare time they needed to spend for making contributions. Instead, recognition and demonstrated capability were the more important motivational factors (Volpel & Han, 2005).

As for the KM systems from 2008 onward, particularly within the implementation of References@SBT, there was only limited use of incentive schemes. An incentive scheme was only used during first few months of rollout to bring quick buy-in (Stocker & Müller, 2010). The ongoing motivational scheme was thought of to be intrinsically available through the social networking tool itself. Individual benefits in form of satisfaction, peer-recognition, and social experience were among the prevailing drivers for user participation (Stocker & Müller, 2010).

5.4 Risk management

Risk management within ShareNet can be drawn from the inclusion of subsidiaries' input during the development of ShareNet (Volpel, et al., 2005). It also involved ensuring buy-in and quality contribution within the user base. The incorporation of content editors, ShareNet managers in local subsidiaries, and ShareNet consultants in the headquarters (MacCormack, et al., 2002) were attempts to mitigate risk specific to quality assurance. Different incentive schemes throughout different periods of time indicated the versatility of Siemens' approach in managing risks related to functional KM systems.

5.5 Evaluation and measurement

Within Siemens, most of the KM evaluations were related to quantitative measurement such as number of contributions and the number of new contracts secured from using knowledge available within ShareNet (MacCormack, et al., 2002; Volpel, et al., 2007). The evaluation mechanism of ShareNet was occurring rather emergently. Evaluations about how ShareNet has benefited Siemens and how it could further be developed only emerged when ShareNet was about to put on hold due to the global telecom downturn (Volpel, et al., 2005). This implies that governance of KM in the aspect of evaluation and measurement in ShareNet was ad-hoc rather than continuously maintained.

With respect to enterprise social software in the current times of Siemens' KM, system usage and system success were both addressed as measures of References@SBT which included perceived usefulness, perceived ease of use, perceived individual benefits, and perceived organisational benefits (Stocker & Müller, 2010). These evaluation outcomes also served as inputs for the improvement of References@SBT. While these have been identified in one instance of evaluation of References@SBT, it was not clear whether the practice has been thriving constantly throughout the full rollout.

6 DISCUSSION

The main distinction of KM implementation in Siemens between the period of prior to and after 2008, as argued in this study, is the breadth and incorporation of a wider spectrum of KM goals. Prior to 2008, KM systems were aimed to locate, preserve, and reuse knowledge and best practices for quick fixes, whereas from 2008 onwards, more attention was paid to increase the level of collaboration and nurturing of communities of practice in addition to knowledge reuse. This brought distinct characteristics of KM governance which fully supported the changes in KM strategy. While the cause of transition in Siemens' KM was beyond the scope of this exploratory study, the transition in KM strategy exemplified KM evolution from first generation to the second generation, as argued by

Tuomi (2002). It had evolved from codifying and manipulating explicit knowledge to the nurturing of communities of practice and collaborative performance.

Changes in the focus of governance activities in almost all Siemens' KM governance aspects, i.e. strategy development, organisational culture, risk management, and evaluation and measurement were evident from the case study. The only governance aspect with relatively constant function was the authority in Siemens' KM. Siemens still maintained its decentralised arrangements in KM, as it had done in the early establishment of corporate KM (Stocker & Müller, 2010). This is consistent with the decentralised nature of Siemens's organisation and business strategy which convey a form of agglomeration, where one particular area of business may be far related from another while maintaining links and integration throughout the company (Davenport & Probst, 2002a). By and large, the KM governance aspects in Siemens adjusted to embrace the transformation of KM strategy from a primary focus on reuse of knowledge to currently include enhancement in the level of collaboration. When the KM initiatives were aimed mainly at reusing knowledge, governance activities were made to ensure that contributions were adequate and impacts were measurable. Further, when KM strategy included the development of enterprise social networking tools for collaborative performance, KM governance was created to support the socio-environment needed and interrelationships between people.

With respect to its multinational setting, cross-cultural management was shown to be critical in determining whether discrepancies between global and local ends appeared. The study suggests that national culture could interfere with organisational culture and impact the likely success of a global KM system, as was evidenced by the issues of traditional values in China and the misused incentive scheme in India. These cultural conflicts fall under the category of system conflict, as argued by Leidner and Kayworth (2006). They are examples of conflict between different perceived values embedded in the KM system and group member values in the organisation. The conflicts resulted in deviation of KM use. Ang and Massingham (2007) reveal that a global KM system may either standardise or adapt KM systems, in relation to addressing the differences in national culture. In the study, it is found that even a standardised KM system should incorporate a level of cross-cultural consideration.

In addition to the cross-culture dimension, relevant incentive schemes emerged as one of the critical factors for successful KM implementation in Siemens. Different incentive schemes were applied by Siemens throughout different periods of KM implementation. While financial incentive schemes were one of the main drivers for participation in ShareNet (Volpel, et al., 2005), the adoption of social networking tools for collaboration within References@SBT was driven by intrinsic motivational factors instead (Muller, 2007). Deviation in the expected outcomes of incentive schemes appeared when little attention was paid towards local subsidiary circumstances, particularly in a decentralised organisation such as Siemens. In order to build a supportive organisational culture through incentive schemes, Siemens should have addressed the variety of characteristics in local subsidiaries. This is particularly the case when decision making in KM is decentralised, as is the case with Siemens. Thus, a centralised approach of incentive scheme was irrelevant to the decentralised KM of Siemens.

7 CONCLUSION

This paper has demonstrated the role that KM governance played in ensuring the delivery of KM goals in Siemens through the lenses of authority, strategy development, organisational culture, risk management, and evaluation and measurement. It has illustrated how KM governance can be a factor of successful KM initiatives and how an MNC could benefit from KM governance in its particular state. The paper suggests that KM governance activities evolved towards change in KM strategy. The KM governance activities in Siemens helped to ensure the implementation of KM strategy towards the desired benefits, i.e., knowledge reuse in the early stage of KM deployment and collaborative performance in the more recent phase of KM implementation. Further, to overcome discrepancy issues of global KM systems, cross-cultural management and relevant incentive schemes must be critically considered. This is particularly needed to avoid pitfalls when standardized global KM systems are to be implemented. Nevertheless, the use of secondary data in this study has limitations,

particularly over the possibly different focus presented by earlier authors. Thus, future research should include validation of the study findings through incorporation of broader samples and analysis based on empirical data.

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