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# UNDERSTANDING KNOWLEDGE MANAGEMENT SOFTWARE-ORGANISATION MISALIGNMENTS FROM AN INSTITUTIONAL PERSPECTIVE: A CASE STUDY OF A GLOBAL IT-MANAGEMENT CONSULTANCY FIRM

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## Abstract

*Inspired by the proposition that "Enterprise information systems configurations chosen by the organisations will encode institutionalised principles into these systems" (Gosain, 2004: 169), this study seeks to draw attention to potential sources of likely misalignment between Knowledge Management (KM) software and the implementing organisation from an institutional theory perspective. Employing a conceptual framework based on this perspective and the extended theory of structurational properties of technology and using a case study of a global IT-Management consultancy firm, the study elucidates KM software-organisation misalignments as the consequence of differences between organisational and KM technology developer's contexts with due consideration of the case organisation's large and diverse user base. Such contextual differences reflect the different institutional contexts where KM technology developers and adopting organisations operate. Theoretically, this study is arguably the first of its kinds to demonstrate how institutional forces can affect KM technology adoption and implementation in an actual business case, thereby enriching institutional theory. Practically, studies of this nature should assist organisations toward understanding the factors inherent within a successful implementation of KM technology in global firms, particularly those rich in high-value text-based knowledge for making decisions like management consultancies and legal organisations.*



*Keywords: Knowledge Management, software, misalignment, institutional theory, global IT-Management consultancy firm.*

# 1 INTRODUCTION

In recent years organisations worldwide have acquired and implemented Knowledge Management (KM) software, believing that such Commercial Off-The-Shelf packages can boost their innovation, creativity and responses to meet the ever-increasing market demands. An increasing number, however, have not gained the expected benefits from the technology and even worse, faced critical failures (Malhotra, 2005). For example in 2002, businesses sank US$2.7 billion into new KM systems (Babcock, 2004). Reflecting on that figure, an e-business consultant commented, "*Tools that have been developed in KM focused on information management and do not support many of the key knowledge work processes"* (Roell, 2004). Understandably if KM technology is not properly aligned with organisational needs and with people's ways of working, or if it results in information overload, then even with the cutting-edge technology, organisations would end up right back at square one: they cannot have the knowledge they need.

In this study, the potential for misalignment can be explained as follows. Whilst KM software packages may be configured to meet a wide range of organisational requirements and even integrated with 'best practices', a poor record of implementation success (Malhotra, 2005) suggests that, in some instances, the misfit between the context of adoption environment and the context within which the software was developed may be significant. Put another way, the privileging of commodification here is problematic for the organisations. To tackle this misfit, organisations could opt for software customisation or organisational adaptation. However, these 'solutions' may themselves be problematic by increasing implementation risks, promoting inefficient workarounds and bear serious implications for future support and maintenance (Besson and Rowe, 2001). In this regard, our reading of literature highlights a lack of research into the fundamental contextual differences between KM technology developer and the adopter. Here we explore the 'black-box' of KM software-organisation misalignment when the speed of software adoption gains greater momentum worldwide.

Using a case study of an IT-management consulting company ranked among the world's top 20 companies and whose offices are located throughout the world, this paper focuses on the causes and types of misalignments identified from a knowledge portal implementation. Significantly, understanding these issues can facilitate senior management to better control the KM project. To address this question, we drew upon institutional theory (Scott, 1987 and 1995; DiMaggio and Powell, 1983; Oliver, 1991) and the extended theory on structurational properties of technology (Orlikowski, 1992 and 2000) to develop a framework to analyse instances of misalignment. Orlikowski suggests that there is *'a duality of structures'*: structures (as reflected by assumptions along with knowledge of the work being automated, resources to accomplish the work and rules that define the organisationally sanctioned way of executing that work) that are inherent to advanced technologies (and hence, anticipated by designers and sponsors) and the structures that emerge in human action as users interact with these technologies. Differences in terms of such structures are viewed from the perspective of institutional theory, which provides insights into how organisations, technology developers and adopters alike, deliberately acquire, or have imposed on them, certain structures to gain legitimacy in their environment and thus to help sustain their business in the long-term (Meyer and Rowan, 1977).

Though there are some studies employing the notion of structures to understand how technologies are implemented in organisational life, a lot of aspects remain uncovered (Orlikowski and Scott, 2008). For example, by using structures Majchrzak et al. (2000) explore the interaction between a virtual team and a collaborative technology whilst Soh et al. (2003), Soh and Sia (2004) and Sia and Soh (2007) investigate the implementation of ERP systems in healthcare and defence industries. Most noteworthy, among numerous researches into KM technologies implementation in the literature, little is known of what and how institutional structures are embedded, appropriated and changed in KM technology implementation project has also underlined our rationales for embarking upon this interesting issue.

The remainder of the paper is organised into four sections. Section 2 reviews the misalignments between the context of KM software and that of adopting organisation. Section 3 introduces research methodology and the framework. Section 4 briefly introduces the case company and presents data analysis and findings. The last section discusses the issues related to findings and gives some conclusions and suggestion for future research.

# 2 LITERATURE REVIEW

## 2.1 Understanding the structures embedded in the software and organisations

Typing in 'technology' to Google conjures up a bewildering array of alternative definitions sometimes focusing on the physical reality of crafted equipment used in the production of goods and services, and at other times concentrating on the knowledge and skills inherent in the crafting of such equipment. A broad definition of technology would ideally acknowledge both the system of knowledge necessary for the manufacture of goods and services together with how technology mediates the environment around individuals and around organisations. In other words, 'technology' as such rarely arrives fully formed but requires mediation. Software for example typically requires appropriation and modification by end-users during operation because end-users are usually unaware of developers' context and their embedded assumptions and rules (Orlikowski, 1992 and 2000). Technology developers engrave their assumption or understanding of the surrounding world in the technology configuration (Latour, 1992; See also Gosain, 2004). Such assumption or understanding of the world is influenced by the institutional properties of their particular work setting and draws on certain components of their institutional context such as knowledge, resources and norms to design technology products (Orlikowski, 1992; See also Gosain, 2004; Soh et al., 2003; Soh and Sia, 2004; Sia and Soh, 2007; Besson and Rowe, 2001). Notably, the spirit of technology, represented by the appropriate behaviours in the context of technology, the understanding and interpreting of technology use and making technology performance explicit and feasible, is affected by its developers' institutional context and then reflected in the goals and values underlying the structural features of the technology. These 'structural' features then incorporate institutional structures such as reporting hierarchies, organisational knowledge and standard operating procedures as rules, resources and capabilities in the technology (DeSanctis and Poole, 1994). As such, it is understandable that the institutional contexts impinge upon the structures embedded in the technology or the implementing organisation. Consequently most organisations face significant knowledge barriers in reflecting their context in their implementation (Robey et al., 2002).

Many of these things hold true of KM software which enables the KM processes. For example, KM software developers draw on their existing sources of knowledge, resources and norms including their own corporate vision, business strategies and prevailing rules and norms about what constitutes good practices (Markus and Tanis, 2000; Gosain, 2004; Soh et al., 2003). In accordance with the institutional theory, to design the software package technology developers have to project the organisational requirements, and tend to learn from organisations in their home market with which they have relationships and other markets where they have official contacts or representation (Meyer, 1994; Nicolaou, 1999). Besides, the institutional perspective allows us to distinguish between country-level and industry-level differences (these issues will be further discussed in *section 2.2*). For example, KM software firms in the UK need to understand both the UK's laws and the industry's standards of maintaining personal privacy and identity as well as company information. They may seek a short cut to this process by seeking out the experiences of pioneers in the marketplace. Eventually the structures embedded in the Commercial Off-The-Shelf product would reflect the context of the association or cluster of organisations with which the developers frequently interacted during the system design and development.

Due to active agency, organisations may respond differently to the institutional contexts surrounding their enterprise systems (Gosain, 2004; See also Currie and Suhomlinova, 2006). In the case of KM software packages, the developer's institutional context could be different from that of many other potential adopters. Such a difference may be exacerbated where adopters are from different countries, industries and sectors than the original association or cluster of exemplary organisations. KM software implementation is now expanding beyond the Western European or North American market where many well-known and competent KM software developers are located. Alternatively, some organisations operating in a legal sector may purchase KM software that is more suitable for those in a financial services sector. From an institutional perspective, obviously, if we consider the coercive force (i.e. governmental regulations and legislations), legal firms are affected by a set of institutional structures (e.g. rules of collecting and storing information, rules of producing reports for clients, etc.) that may be different from that of financial services institutions (i.e. rules for sharing and transferring data, norms of maintaining the integrity of customers' and company internal information). Interestingly, even organisations operating within the same industry in a country may not share the same vision and knowledge of KM systems and practices due to differences in company's history and profile (Powell and DiMaggio, 1991), differences in economic, social and cultural background (i.e. organisations locate nationwide) and differences in reacting to market forces (i.e. considering the five-force model of Porter (1998)), and thus, as Farjoun (2002) notifies, possess different sets of institutional structures. Such a difference in the same organisational field is also due to the variations in the nature and strength of institutional forces exercising on different parts of an organisational field (Currie and Suhomlinova, 2006). The two giants in semi-conductor manufacturing, Intel and AMD, are good illustrations since they are in the same country and industry but do not seem to share completely the same institutional structures.

Empirical evidences inform that critical differences between the rules, resources and norms embedded in KM technology and in the implementing environment can even result in negative consequences, such as the collapse of many KM technology programmes (Kontzer, 2003), the inefficient and costly performance of British Aerospace's knowledge portal (Hoffman, 2002), or the Columbia space shuttle's knowledge sharing and integration system malfunction in 2003 (Computer Weekly, 2003). The reasons for such consequences may be attributed to the separation of developers from users in terms of time and space (Orlikowski, 1992) and that users tend to abandon any attempt to enhance the interpretive flexibility of technology (Pozzebon, 2001). Problems arise when these fundamental issues are not taken into account until later in the implementation phase. Though prior studies have employed different institutional arguments, there is obviously a consensus on the mechanism of how organisations are imposed by and deliberately adopt institutional structures to gain legitimacy (Scott, 1987). The next sections will elaborate these mechanisms.

### 2.2 Structures that are imposed on organisations

According to institutional theory, organisations are imposed by two types of authorised sources: the coercive authority of nation-states, and the normative authority of professions and industry (DiMaggio and Powell, 1983; Scott, 1987). By promulgating laws and regulations countries exert coercive pressures, and organisations accept the requisite structures to embed in their business processes to maintain legitimacy in their environment. For example, Massey et al. (2002) identify the case of Nortel Networks, which went through many changes in its KM initiative due to the government's deregulation of the telecommunications industry. Indeed, before deregulation, those operating in the telecom industry were governed by many of the state's rules affecting firms' innovation and competition. In particular, organisations operating in highly regulated domains tend to have information systems with similar mandated structures (Gosain, 2004).

Different countries exercise different types of institutional pressures and organisations will therefore need to adopt differing requisite structures (Gosain, 2004). Problems, however, could arise when the implementing organisation is based in a country whose institutional pressures are different from those

existing in the home countries of the developers. Generally, there are many dimensions in which countries differ from each other; yet only some certain differences will be relevant for analysing potential causes of misalignments with regard to KM software implementation. Since KM software are meant to support the processes of knowledge and creativity entities, differences in national knowledge and intellectual institutions should be considered. The knowledge and intellectual institutions and the laws and regulations imposed by each country on the organisations operating within its boundaries reflect its values and norms. In some countries, the government could play a decisive role in knowledge and intellectual property activity, and KM software designed and developed in or for such markets may inherently have features protecting intellectual property rights or nurturing innovation. For instance, KM software, if outsourced to a country where intellectual property and privacy are not strictly protected, may not be incorporated with the strong intellectual property protection required by certain developed countries (such as the UK, Switzerland and Singapore). Software adopters should therefore consider the extent to which national level laws and regulations pertaining to industry standards, knowledge, intellectual property, privacy with organisational identity and confidentiality (Malhotra, 2004), information security, human resource and cultural issues (Akhavan and Jafari, 2006), trade between organisations and between organisations and other key players in the value chain (See for example Malhotra, 2004; Dyer and Nobeoka, 2000), and new product and service development are different from those assumed by software developers from their own context.

Besides the coercive pressures created by nation-states, industry and professional associations or networks are more likely to create normative pressures through guidelines on good practices and industry accreditation and recognition of organisations, or inter-relationship of firm-supplier and firm customer (Scott, 1987; Dyer and Nobeoka, 2000; Massey et al., 2002; Burt, 1982). To gain a certain level of recognition of the industry, organisations have to follow procedures that are appropriate to their operation (Meyer and Rowan, 1977). For instance, the AS 5037-2005 standard gives guidelines on designing KM for any community or organisation (SAIGlobal, 2007). Asian Knowledge Management Association (AKMA) in Hong Kong is the first professional body to have developed a series of certification standards specific to KM (i.e. KM 8001), intellectual property protection (IP 8001) and intellectual capital realisation (IC 8001) (AKMA, 2007).

As mentioned above, organisations operating in different industries or sectors may also possess different institutional structures. The contextual differences of industry impinge on the structures incorporated into KM technology, as well as the structures embedded in the implementing organisations, and empirical studies have shown how such differences have lead to organisational problems. For example, Malhotra (2004) identifies the case where integration of data and processes across inter-enterprise value networks imposes certain challenges of organisational control on the design of KM systems. In effect, if the organisation adopts a KM system, which shares accurate information related to goods or services flowing across the supply chain without considering the potentially paradoxical roles of collaboration and competition adopted by various players in the same supply chain, then the organisation is likely to face peril in its operation. Another interesting case is Toyota which has established network rules/norms which is capable of imposing certain economic sanctions (e.g. withdraw business) and filter only those players in its supply chain to join if members agree to openly share their knowledge resources (Dyer and Nobeoka, 2000). Network members must therefore design their own KM systems in a way that facilitates 'open sharing'.

From a strategic perspective, the Knowledge-Based View (KBV) (Spender, 1996; Grant, 1996) also provides the important insight that the speed, efficiency and accessibility[1] of the knowledge types

[1] Kogut and Zander (1996: 503) suggest organisations look for the *"speed and efficiency"* of the technological solution in enabling the knowledge process. Alternatively, the technology must also enable *'differential access to externally generated knowledge'*. (DeCarolis and Deeds, 1999: 954).

could be in part identified through industry and professional differences. Differences in knowledge types will give rise to differences in routines and structures for extracting, distributing, applying, and re-using the knowledge (See for example Tiwana, 2000; Maier and Remus, 2001). A KM software designed and developed in the context of industries with lower requirements for speed, efficiency and accessibility may not have the competent routines and structures to support the KM processes for an industry where similar requirements are set very high. For instance, whilst a public council and a management consultancy firm have a similar need to provide staff and clients with knowledge about their services, the requirements for speed and accessibility of a knowledge portal in a consultancy firm could be higher than that of a public council. There are implications of what are acceptable degrees of such dimensions. Pushing and pulling knowledge items in the portal and search engine for a consultancy firm could likely require more complex sophisticated features and procedures than those designed for a public service organisation.

### 2.3 Structures that are deliberately acquired by the organisations

In addition to the imposed structures, under some mechanisms, organisations also deliberately acquire certain structures. Institutional theory has identified two types of pressures affecting the organisations: mimetic pressure arising from the uncertainty of the business environment, and the normative pressure arising from the inter-relationship between firms within a profession, business and trade (DiMaggio and Powell, 1983; Scott, 1987; Burt, 1982). When the business environment is volatile, organisations experience the mimetic pressure by modelling their structures on other organisations in their fields (i.e. competitors and peers) that are perceived as more legitimate or successful. Alternatively, thanks to participating in a professional or trade body, good structures are promoted and shared among members for the sake of improving their performance (Scott, 1987).

More proactively, other mechanisms also explain why organisations voluntarily adopt structures. New institutional theory embraces a variety of strategic responses to the institutional environment (Oliver, 1991), acknowledging that organisation's self-interests and active agency facilitate organisations to have more choices in acquiring appropriate structures to meet institutional forces (DiMaggio, 1988; Covaleski and Dirsmith, 1988). In other words, organisations can be more active in adopting "interest seeking organisational behaviour", and hence, to have more leeway in choosing the structures (Oliver, 1991: 146). For example, to deal with strategic contingencies, organisations will tend to reflect the complexity of environmental components (i.e. the prominent aspects) into their own structures (Scott, 1987). Oliver thus implies that even organisations operating within the same institutional context may deliberately acquire and retain differing sets of structures.

The way that organisations deliberately adopt certain structures is driven by how they themselves perceive and adopt the structures for more efficient use of organisational resources (Scott, 1987). From a strategic perspective, the Knowledge-Based View (KBV) conjectures that organisations achieve competitiveness by sustaining dynamism and continuity of knowledge creation (Nonaka et al., 2000). For instance, for large organisations, particularly global management consultancy firms, the ability to continuously push content "in context" is a must (Ezingeard et al., 2000). Given the recent unprecedented growth in volumes of data and information and the continuously evolving variety of technology architecture, a sense of (dynamically updated) business outcomes and an awareness of individual knowledge needs could help determine what information should be created and pushed to the appropriate users in a timely fashion (Malhotra, 2005; Ezingeard et al., 2000). Additionally organisation can opt for the structures that reflect the organisation's history and experience (Powell and DiMaggio, 1991), and management and user interests for certainty and stability (Oliver, 1991). For example, organisations develop certain ways to solve recurring problems of the knowledge portal, i.e. being overloaded with "unprocessed data and processed information" (Malhotra, 2005: 10), and over time these solutions become part of organisational routines.

# 3 RESEARCH FRAMEWORK & METHODLOGY

## 3.1 Research framework

Our literature review has suggested that the likely misalignments of institutional context between KM software and the adopting organisation can be conceptualised as in the figure below. The research framework is based on Markus and Tanis's (2000) four-phase view of the enterprise system experience cycle. What is worth highlighting in this study is that we concur with research models suggested by Sia and Soh (2007), or Soh and Sia (2004), but we propose that two noteworthy elements be incorporated into their framework to better understand the phenomenon of KM technology adoption in organisations. First, we acknowledge the existence of normative and mimetic pressures, which we believe are important for our case firm (within its industry) with due consideration of Knowledge Management features (More discussion on the impacts of these pressures on KM technology implementation will be presented in *section 5*). These institutional pressures are in effect not explicitly considered by the above mentioned authors. Second, we view the instances of misalignments by opting for Markus and Tanis's lens as it facilitates us to clarify the business context where instances of misalignment expose. This business context is also essential to understand how KM processes and practices actually occur throughout the knowledge portal lifecycle. We therefore arrive at the final research framework as in *figure 1*. Based on actual implementation of the portal in this firm, we focus on the first three phases. Phase I, the chattering phase, involves gathering and defining the business case and solution constraints. Phase II, the project phase, involves getting system and end-users "up and running". Phase III, the shakedown phase, involves getting the system and users to be in normal operation after the system's roll-out. Each of these time phases occurs in sequence with no time lags in between the phase.

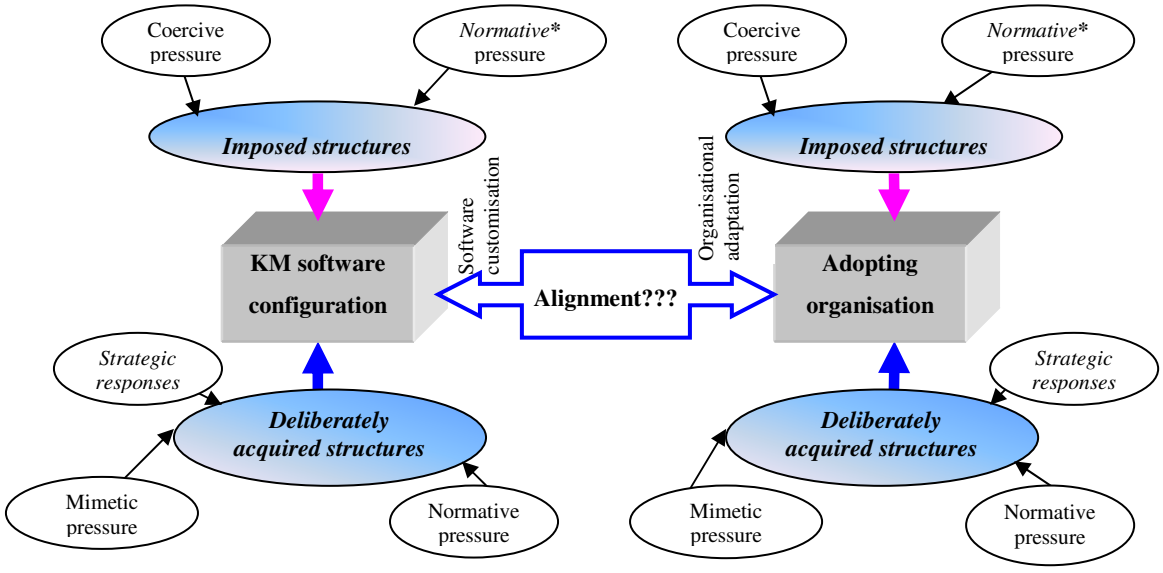


*Figure 1. The likely misalignments between KM software and the adopting organisation.*

## 3.2 Research methodology

This study employs a case study strategy (Yin, 1994) to investigate the likely misalignments between KM software and the implementing organisation. Here we are investigating a contemporary

phenomenon within its real-life context, especially when the boundaries between phenomenon and context are not clearly evident (Yin, 1994).

We analysed the Change Request Forms (CRFs) submitted by the organisation from phase I to III to identify instances of misalignments. To exclude instances of minor or trivial misalignments only those reviewed and accepted by the KM team and recorded in the standardised CRFs were analysed. The KM team uses CRFs to decide whether to adapt or customise the portal. Following this analysis, semi-structured interviews were used to confirm and further clarify the contexts and rationale of identified and potential misalignments. We were in the field for 8 months understanding the company's business processes, reviewing the KM system and documentation (e.g. the portal, company's documents, contracts, project files, meeting minutes, requirements analysis, and issues logs), and interviewing 18 key internal stakeholders to gain insights from many different perspectives including the KM programme manager, KM roll-out project managers, content managers, IT experts and senior consultants across the services sectors. Especially, what is convenient for our data collection on the portal acquisition and installation is that this case company itself is also a strategic partner of the KM technology vendor. Additionally, informal meetings formed further sources of data gathering. Care was taken to consider all pertinent case evidence to reduce the risk of research bias. Contextual data that further explain the observations made were taken into account (Klein and Myers, 1999). Each interview lasted about an hour and was then transcribed and checked with interviewees for accuracy. Using QNVivo, the interviews were analysed to identify the sources of misalignments. The conceptual framework is used to examine the data, and to consider some *'what if'* questions arising from problems reported by the interviewees or anticipated during the case. Findings were also discussed with 2 industry experts with rich experience of KM implementation. Some instances related to technical or interface issues were not considered. We therefore arrived at a total number of 83 distinct instances of misalignments, of which there are 23 instances of imposed structure misalignment. Our analyses were conducted as an iterative loop to uncover the factors underlying each instance.

# 4 FINDINGS

## 4.1 Case company's profile

*KLN (as a pseudonym name)*, currently ranked within the world's top 20 companies in terms of revenues, is a global IT-Management consultancy firm and employs tens of thousands of people in over 40 countries. KLN provides business consulting, systems integration and IT and business process outsourcing services across diverse markets including telecoms and media (T&M), financial services (FS), energy and utilities (E&U), industry, distribution and transport (IDT), space and defence (S&D) and the public (P) sector. The company formally launched its KM initiative in 2006 although it had used portal technology from mid 2003. From late 2006, the company decided to migrate onto the latest version of the portal technologies with many enhanced features and a new design. The company's portal is organised into three environments, namely *My Information*[2], *Workspaces*[3] and *Our Knowledge*[4]. This organisation was chosen based on a combination of accessibility and representativeness: KLN has implemented its KM initiative and the knowledge portal in a substantial way; KLN has a large-scale portal implementation in terms of its user base; KLN's global operational context (i.e. the corporate-level and local-level company and different service sectors) presents interesting issues of portal-organisation alignment, e.g. the diversity in deliberately choosing structures.

[2] *My Information* provides private and shared information relating to each staff.
[3] *Workspaces* are web-based environments that enable teams to share and collaborate on information.
[4] *Our Knowledge* is a central store of publications, shared with all company staff. The information is stored in knowledge areas by subjects, such as sales and marketing and market intelligence.

## 4.2 Findings

### *4.2.1 Deliberately acquired structure misalignments*

We found that most deliberately adopted structures misalignments typically arose from strategic responses to institutional context, i.e. the unique history and profile of this global firm or the management and user interests (both at the corporate-level and local-level) and not many misalignments arising from mimetic and normative pressures were identified. The misalignments were largely found in phase III and a few in phases I and II, and can be classified into four main sets of instances in accordance with our conceptual framework.

The first set of misalignment instances relates to the company's history and experience. For example, the company's re-structuring in T&M sector has resulted in inconsistencies in the metadata[5] definition, which prevent staff of Business Telecom collateral project from properly uploading documents to *Our Knowledge* (See *Table 1*). Likewise, because of the company's acquisition of a Spanish telecom service firm, a change of hierarchy and number of libraries within the existing *Our Knowledge* to hold the content of Sales and bids project was called to support uploading more documents and KM system integration. In another instance, given the nature of work and the company's experience, most senior consultants in the company favour searching and grouping results by content types (i.e. brochure, project summaries and references) as they believe content type is important for refining what they are looking for. With the submission of this CRF, the two KM roll-out project managers justified that the retrieval process would be more productive and accurate when knowledge items are stored, categorised and displayed in content types.

The second set of misalignment instances touches upon mirroring the complexity of environmental elements into the company's own structures. In relation to strategic responses, unlike the case of ERP systems, where an organisation enhances its competitive advantages within its business environment by targeting different market segments within its industry, offering distinctive value propositions, and implementing routines and structures in its interaction with key players in its value chain (Soh and Sia, 2004; Sia and Soh, 2007), the organisation in this case focuses on the reducing its disadvantages by learning from the uncertain and instable nature of its business environment. Given requirements raised by many business units, both at corporate and local level, the need to facilitate a smooth and fast performance on thousands of existing workspaces is emerging. One way is to request for a simple control mechanism (i.e. the right for accessing) of collaborative workspaces to local business without creating hundreds of centrally-managed security groups, the company can ensure that the role-based permission is driven and dictated by the local business units themselves to support knowledge sharing and application. Similarly, for another instance, a changing of structure is considered so that workspaces, which are associated with default lists or web-parts for all bid workspaces and owned by UK financial services, can be captured and saved to be fed into bidding processes for efficient re-use, and ultimately for large-scale KM take-up within delivery teams. Importantly, according to a content manager of a service team in Bangalore, India, one of the challenges to introduce group KM system is to cope with all of different views, "*The UK has these markets and these propositions…the Dutch has a different view…"*. The company is thus requested to have a single definition for certain key attributes whilst maintaining flexibility for each country to extend the taxonomy. Following this approach, the company can remarkably enhance the portal's capability of searching for concepts by a more comprehensive automatic classification of contents.

The third set of instances points to the interests of management. There are a lot of requests for the sake of enabling management preferences ranging from automatic importing knowledge from external

[5] *Metadata* describes the name of project bid and document, content type, author, publishing time, priority, etc. for effective document classification. For the portal, *metadata* is important to facilitate staff to search the knowledge by concepts.

party into *Our Knowledge* to developing archiving solution or integrating functions to support knowledge reviewing process in the *Workspace*. For example, there was a request for changing and developing an archiving solution that allows management to get rid of the workspaces that they have finished with. This means management should be able to harvest completed project for useful knowledge and then make this knowledge available for re-use. Then, because lack of reporting (i.e. on pushing and pulling knowledge items from *Our Knowledge*) led to resistance in terms of KM implementation in some parts of the business, there was a request for updating the reporting function. The context has been clarified by the KM programme manager, "*One of the key things is to provide them [with] the feedback in terms of what is actually happening. If we ask the Marketing department in a country to do something, then we need to show them what they have actually achieved so far and give them some targets, for example and allow them to compare how they are doing with another company in other parts of business...So, we will know how much content is being provided by which part of the business and what the usage level like"*. Enhancing reporting function is therefore very beneficial for management to evaluate the application and sharing of knowledge across the firm.

Within this global company, seeking structures to meet its user interests is high on its agenda. This is echoed by the KM roll-out project manager and two senior consultants, *"Since we have people with different cultures and backgrounds, satisfying their [common] preferences and the local-level [working conditions] is crucial to ensure a powerful global delivery for our clients"*. Changing of structures varied widely from enhancing the navigation structure to guide users towards the right place to increasing the search relevance in accordance with the metrics on document usage, or to perform live search and further filter the search results. In one instance, to facilitate the use of knowledge, many users of the IDT sector in Sweden and US requested modification of the structure so that they can create and customise their own workspaces based on their specifications. Business units in E&U sector in Nordic countries, which had been acquired by KLN, suggested resuming the structure, with which they were familiar before merger, so that they can receive automatic reports based on the content of specified fields that change in the workspace. Additionally, the configuration of 'Search Result Webparts, which helps display the content on the pages, was asked to change to give the content owners and the KM team the ability to dynamically update topic pages with key content. Continuously and dynamically updating content is a key to enhance the efficient of knowledge use (Nonaka et al., 2000).

Very few misalignment instances arising due to mimetic and normative pressure can be identified. Some business units in E&U sector in Bangalore hold membership of Knowledge Enterprise Association, which encourages its members to follow certain rules to network with each other via the portal. Such a 'networking' is very beneficial for the case company since best practices of KM (i.e. sharing knowledge between the firm and its suppliers to tackle physical supply problems) discussed each month within this association are populated, and then it is pushed for changing the existing structure to ensure inter-operability across the portals. Besides, thanks to the suggestion of some clients, business units of S&D sector in France requested to adopt a particular structure within *My Information* environment that allows consultants to find the number of people having a certain skill and helping them respond to capacity questions.

### *4.2.2 Imposed structure misalignments*

In accordance with our research framework, we also found some incidents of imposed structure misalignments arising due to pressures created by authority sources such as nation-states through law and regulations and profession through industry standards and practices. Most of the imposed misalignments were found during phase III as requirements for change came from the company's actual performance within the industry as well as interaction between the company and its clients. Generally, our analysis informed that the imposed misalignments caused by the country are mainly attributed to the three main issues (I) inter-government and government policy of privacy and data protection; (II) German regulations on data storage and (III) the rules on working with information in the S&D sector. The low number of imposed misalignments due to coercive pressures can be

explained by the fact that consultancy is not a highly regulated domain unlike financial or legal services (Gosain, 2004). Regarding the first issue, since this is a global company, the issue of privacy and data protection across the frontiers is highlighted. Compared to the US, the home market of this portal, where discussions about data privacy and protection are still at an early stage, the European Union's more aggressive regulatory approach gives rise to the issue of data retention within the portal and search engine. Since this company provides services to European clients and maintains personal data processing activities in Europe, the practice of data retention (e.g. storage of server logs) within the portal is illegal and needed to be modified to comply with the EU laws (See *Table 1*). Similarly, commercial and national sensitivity issues in some Middle-East based client organisations, required modification to protect information integrity. More concretely, in these countries, governmental rules and regulations strictly control the sharing and distributing of their countries' know-how on energy exploitation and production. On the one hand, accessing or searching this kind of information in the portal is required to be limited to 'recognised' consultants and these consultants must follow strict procedures under the supervision of clients. On the other hand, clients must have full rights to access their project externally. The problem arose because as the portal was developed in the North American context, it was not designed to handle those sophisticated routines.

German regulations hold that certain information (i.e. customers call records) cannot be stored and processed outside Germany. As described by a content manager in T&M, *"When it comes to local legal requirements, we have to have a workspace implementation [for] local. So when we designed the industry architecture, we made the environment flexible enough to allow people to hold their information locally and it [the environment] is still made use for the enterprise functionality"*. This coercive pressure prompted the need to change the procedures of how consultants pull and push information between the portal and Germany-based content stores of service providers to avoid information bottleneck or overload.

As S&D projects' nature is quite 'sensitive', every action must be performed on workspaces set up for given groups and monitored so that people know what is going on, and for certain governmental and defence contracts, the information cannot appear in the search engine or workspaces. In fact, the portal did not have the ability to 'mirror' all actions conducted within the workspaces in real-time and to automatically hide documents containing 'sensitive' concepts and keywords in the search results.

Imposed structure misalignments identified due to the contextual differences in industry can be classified into issues with regard to inter-relationship of firm-supplier and firm-customer. Three such prominent sources of structural differences are (I) the emerging political and physical supply pressures in the E&U sector; (II) pressure for new content innovation in the T&M and (III) requirements for publishing and distributing knowledge items for clients in the legal sector. Different requirements set by suppliers or customers lead to different ways of changing structures embedded within the portal. For instance, to reduce business risks due to political and physical supply pressures, some clients in Japan, Singapore and the Netherlands require this case company to adopt certain procedures to ensure the reliability and accuracy of newly created knowledge (i.e. know-how and know-what to tackle disputing problems in energy transmission and use as well as predicting the cost along the industry value chain) within the portal. It is thus to design a new tool incorporated into the workspaces of E&U sector in these local countries to support the QA (Quality Assurance) team to enhance the knowledge auditing process. Moreover, the quest to continually provide a new and diversified range of contents (i.e. image, audio and video files) for clients creates pressure around the fast-moving T&M industry. To meet the ever-increasing demands of international clients, this case company must work closely with information service providers, such as Gartner, Butler, Factiva, which impose special standards to protect the integrity of contents shared between the portals. Similarly, some clients of the legal sector in Japan strictly require that before sending information extracted from the workspaces to them, the case company must check whether this information follows specific requirements in terms of confidentiality and style set by them. The case company therefore had to re-create the information in a new way to comply with clients' needs.

| *CRF#* | *Brief description* | *Classification* | *Business justification* |
|---|---|---|---|
| *CR0152 (Submitted 23/04/ 2007)* <u>*Priority:*</u> *Medium* | This CR (Change Request) is related to the Telco Product business [the Mobile market: SMS, Message centre], which was sold out recently. There's a need for alignment of the metadata with the current business. | Deliberate | To correct inconsistencies in the current metadata definition and portal implementation, which currently prevents the ILOB (International Line of Business) Telco collateral project uploading Telecoms and Media collateral to *Our Knowledge*. |
| *CR1307* *(Submitted 10/12/ 2007)* <u>*Priority:*</u> *High* | EU's regulations hold that data retention of clients in the portal and search engine as well as data processing activities in Europe (e.g. storage of server logs) is illegal. | Imposed | Structures of holding and processing customers' data within the portal must be changed. |

*Table 1. Examples of imposed and deliberately acquired structures.*

# 5 DISCUSSION & CONCLUSION

Our findings from this global firm inform several interesting issues for consideration. As far as the imposed structure misalignments are concerned, a thorough grasp of international and national rules and regulations together with industry's standards and practices (e.g. via the firm-supplier and firm-customer relationships) has to be incorporated into the KM software adoption process. Equally important is understanding the structures embedded in the software package, which could be effectively gained during phase I and II. It is noteworthy that management and the KM team should be able to distinguish the unique context of their own organisation and that of the technology developers. For example, for management understanding the industry type as well as the KM strategy and objectives, and particularly pursuing questions such as *'What makes us different?'* or *'What if?'* may help clarify such contextual differences. Since this is a global organisation whose offices are based in over 40 countries, a wide variation of rules and regulations imposed by each country or a group of countries (as exemplified by the EU in this study) requires significant efforts and trade-offs to comply. More importantly, Kostova and Kendall (2002) introduce the *'institutional duality'* concept, whereby a multinational organisation experiences two-level of institutional forces: the parent-firm and the local-firm level. All of this is reflected in our analysis and an obvious challenge for management in this case company is how to strike a balance between the institutional pressure affecting the parent firm and the local business units. In other words, the case company should be able to weigh up the benefits obtained for the parent and local firms whilst maintaining its business and KM strategy. We subscribe to Majchrzak's et al. (2000) viewpoints on the causes of changes in structures of technology (and in virtual teams), and expand that over time more and more emergent routines and structures will be continually developed as a result of frequent interactions of this global firm, which also involves a large user base, with the government and industry (including partners, suppliers and clients) of each country. These structures and routines may eventually give rise to even more complex conflicts that are worth considering. In this regard, what is worth mentioning in this case is the KM group's attitude towards changing of structures, *"These kinds of Change Requests keep emerging all the time as our business's nature is pretty uncertain [in terms of customers' requirements]…We see them [the changes of structures] as parts of our creative culture or opportunities to review our KM performance…and therefore try to embed such behaviours into our as-usual business processes"*, commented the KM roll-out project manager in US. Interestingly, in line with Nicolaou's observation (1999), the study found that cultural expectations also create constraints on the design and use of KM technology, which were illustrated by the clients' imposition of structures of pushing and pulling knowledge items. Since knowledge, information and data are the central objectives of the computing industry, which has been evolving tremendously, and given the ever-changing of the social, economic

and political context nowadays, we believe that the institutional context will further influence KM technology implementation. There is then a need for more studies to look into how and in what aspects the institutional context can affect KM technology developers and adopters.

In addition to the imposed structures, institutional theory also interprets that an organisation can deliberately seek certain structures, whereby gaining more confidence and improvement or preparing for strategic contingencies. More concretely, this consultancy firm with its 'global operational context' and its large user base for the portal pose significant barriers and opportunities to adapt to competitive forces. On the one hand, the strategic objectives set by management, e.g. *'A powerful global delivery capability'* and *'A balanced market sector profile'*, prompted the need to strengthen expertise, experience, collaboration and responses. Such objectives can be achieved by dynamically and effectively supporting KM processes, e.g. sharing, searching and grouping by content types, accessing mechanism, capturing information for re-use, archiving solution, networking and reporting, through evolving selected organisational structures and routines. On the other hand, so many requests from this large diversified community may cause confusion for the firm to decide and acquire the most appropriate structures since there are many implications of what are acceptable degrees of such dimensions. Regarding our research framework and the findings, although the number of misalignment instances due to mimetic and normative pressures is fairly low, we believe that these two institutional forces will keep exerting more influences on the portal implementation towards the end of phase IV. Since other competitors are well ahead of the case company in terms of KM implementation, this company still has a lot of chances to benchmark itself against these leaders or peers by holding memberships of some KM professions and associations both at corporate and local level or by buying best practices from information providers (e.g. Gartner). Moreover, the fact that the company's business is uncertain and more international and involves many industries also prompts the need of acquiring unique knowledge seeking and sharing structures. We summarise the dimensions of imposed and deliberately acquired institutional structures with some typical examples in *table 2*.

As mentioned in the introduction, we are interested to see what and how the structures are embedded and changed in KM technology implementation. Indeed, many instances of misalignments have illustrated some special features of Knowledge Management. Unlike ERP systems where business processes (e.g. financial reporting, payment scheme or billing format) are heavily embedded (See for example Soh and Sia, 2004; Sia and Soh, 2007), the extent to which the knowledge work processes are 'embedded' in the portal appears to be more depending on factors such as the knowledge types (Tiwana, 2000) and speed, efficiency and accessibility presented in section 2.2. This can be exemplified by adding the structure of locating and connecting experts across the firm based on skills described in *My Information*; defining a single taxonomy with flexible extension at local-level to support an automatic and comprehensive classification of contents; changing the existing structure to support searching and grouping in content types; or changing the existing structure for a simple accessing mechanism of collaborative workspaces to local business. What we found is that whilst business processes seem to be 'fixed' in many ERP systems, the process (and structures) of managing knowledge in the portal could be even more complex and dynamic as the nature of knowledge and information is very volatile. Even in the case that the information is not outdated, the knowledge users may question the interpretation of that information given the changes in the external business environment (Maholtra, 2005). This is clearly reflected in our case where the KM roll-out project manager and senior consultants talk about the need for a navigation structure to guide users towards the right place to increasing search relevance. For a better control of KM processes and structures, it is essential that implementing organisations should look for a technology that has sufficient 'room' or acquire license codes from KM vendors for their own configuration.

Implications drawing upon our experience with this global firm could also extend institutional theory. Indeed, we argue that the more internationalised the company's business environment (e.g. more mergers and acquisitions, more country-markets and clients), the more impact that institutional forces will make on the company via the resultant structures and routines embedded in KM technology. Besides, the higher and more requirements from business environment for innovation, creativity and

responses, the more unique structures will be voluntarily acquired in a variety of ways to enrich expertise and experience and to strengthen 'networking' or collaboration. In other words, for this global firm the quest to gain legitimacy throughout the world is critical, and as such, not always passive but dynamically responsive according to their resource dependencies (Oliver, 1991). Interestingly, this study could in part demonstrate Chattterjee's et al. (2002) argument that in addition to the organisation itself, which has been widely considered as 'an institution' in the literature, senior management (here represented by the KM programme manager and KM roll-out project managers) are indeed 'institutions' because, as defined by Scott (1995), they are a social structure giving the organisation or individuals lines of actions or orientations, whilst controlling and constraining them. For IT adoption and innovation, a need for broader definitions of institutions is important towards analysing the effects of institutional forces (Mignerat and Rivard, 2005).

| **Structure & its dimensions** | | **Descriptions** | **Examples** |
|---|---|---|---|
| *Imposed institutional structures* | Nation-states | Law and regulations | *Inter-government and government policies of privacy and data protection* |
| | Profession & industry | Industry accreditation<br>Inter-relationship of firm-supplier and firm-customer | *To reduce risk due to political and physical supply pressures, clients require to adopt structures to ensure the reliability and accuracy of information sent from the portal.* |
| *Deliberately acquired institutional structures* | Perceiving of uncertainty of business environment | Learning from competitors and peers | *Clients give suggestions to help firm better connect and locate experts based on skills.* |
| | Inter-relationship between firms | Sharing and promoting good practices | *The local business unit, as a member of a KM association, is encouraged to ensure the inter-operability of its system.* |
| | Adapting to strategic contingencies | - Reflecting the complexity of environmental components<br>- Reflecting the organisation's history and experience<br>- Seeking management and users' interests | *A single defined taxonomy with flexible extension at local-level to support an automatic and comprehensive classification of contents.*<br>*Searching and grouping results by content types.* |

*Table 2. A summary of imposed and deliberately acquired institutional structures.*

KM is not yet widely diffused across organisations worldwide. Different organisations hold different views of KM processes and assumptions (i.e. knowledge sharing culture, relationships between KM styles and industry types (Choi and Lee, 2003)) and this therefore leads to a variety of package configurations. There is a lack of dominant design in this respect (Abernathy and Utterback, 1978). Our study of this global IT-management consultancy suggests that misalignments can be effectively surfaced once there is a close co-operation between the developer and management during phase II and particularly phase III, whilst many misalignments of small firms may be well addressed in phase I. Informal discussions with the KM team highlight that the adopting organisation should play an important role in raising the KM technology's awareness of the institutional context, that industry types and knowledge types (Choi and Lee, 2003; Tiwana, 2000) will give rise to different structures

and routines over time, and that an effective collaboration between them in phase II and III remarkably contribute to expose the software–organisation institutional differences.

The contributions of this study are twofold. Viewed from the lens of institutional theory, this study is arguably the first of its kinds to demonstrate how institutional forces can affect KM technology adoption and implementation in an actual business case, thereby enriching the institutional theory. Alternatively, from an organisational perspective, given increasing technological dependence within organisations, understanding how technologies are designed and deployed and who gets to use and change them and with what consequences are highly salient as these issues *"profoundly affect the manner, quality, and outcomes of organisational realities"* (Orlikowski and Scott, 2008: 5). Practically, studies of this nature should assist organisations toward understanding the factors inherent within a successful implementation of KM technology in global firms, particularly those rich in high-value text-based knowledge for making decisions like consultancies and legal organisations.

Results of this study must be interpreted in the context of its limitation. First, institutions and their effects can be studied at different levels of analysis, and the level for analysis in this paper is just the organisation or business unit implementing KM technology. Second, given Markus and Tannis's (2000) four-phase enterprise system lifecycle and the actual implementation, this single case study has only encountered the first three phases. Misalignments arising during the onward and upward phase, which continues from normal operation until the system is replaced by an upgrade or a different system, remain undetected. This latter phase is essential for a complete assessment of the misalignments between the portal and this global firm. Future research should look into misalignments identified from a more highly regulated domain such as legal or health-care services or how such misalignments influence the way management decides to response via organisational adaptation or KM software customisation.

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