The Process of Creating Value With Intellectual Capital Practice as An Intangible Asset in Communities of Practice in The SME: An Empirical Case Study

Bjarne Christensen
Department of Language and Communication, University of Southern Denmark, Odense, Denmark
bjarnec@sdu.dk

Abstract: In the realm of knowledge management, great emphasis has been put on intellectual capital (IC) as an important and, partially, intangible asset for achieving economic value and competitiveness. This has led to many attempts to measure the economic value of IC. These methods, however, are to some extent questionable and do not seem to be recognized in practice, scholars claim. This might be due to the intangible character of IC. Even though scholars have conducted studies on IC, more research on IC practice and the value creation process with IC is called for; especially in the context of a small to medium-sized enterprise (SME). Based on an empirical and qualitative case study of an SME, the current paper explores the process of IC practice creation and how IC practice is related to value in tangible-intangible dynamics in the SME. The current paper applies practice theorising and the community of practice (CoP) approach to propose how IC practice can create value by integrating intangible knowing about end consumers in the practice of producing tangible output. The empirical results illustrate how establishing communities of practice and fostering knowledge brokers facilitating meaning-negotiating processes is crucial to developing IC practice as intangible assets in the SME, and the paper discusses how making the intangible knowing tangible may increase the value of intangibility in the process of creating IC value and IC practice.

Keywords: Intellectual capital, measurement, intangible assets, communities of practice, knowledge brokers, SME

1. Introduction

The assumption that intellectual capital (IC) is a valuable, intangible asset to businesses is widespread in the field of knowledge management and IC (Osinski et al., 2017). This has led to an increased attention towards the measurement of the value of IC. However, these measuring tools aimed at measuring the value of IC as an intangible asset are questionable (Ibid.). Further, measurement of IC and intangible assets is mainly of concern within accounting research (e.g. Mouritsen and Thorsgaard Larsen, 2005, Castilla-Polo and Ruiz-Rodríguez, 2017). However, before measuring the value of IC as an intangible asset, an understanding of the process of the value creation of IC is crucial (Cuganesan, 2005). This paves the way to study what IC does rather than what it is and how IC is related to value rather than if it is valuable as called for by Mouritsen (2006). In the same vein, the study considers IC practice the interaction of the tangible and intangible assets as interdependent resources in practice; a study that has been called for by scholars (Marr et al., 2004, Cuganesan, 2005).

In spite of the great influence that SMEs have on the global economy, only little attention is paid to SMEs in IC literature (Marzo and Scarpino, 2016, Guthrie et al., 2012). Additionally, the need to study IC in the SME is supported by the view that SMEs throughout Europe are under pressure from globalization due to increased international competition, and SMEs also need methods with regard to managing IC (Mertins et al., 2009). Thus, the current paper explores how IC is practiced and how it is related to value in the context of an SME.

In order to investigate IC from this performative perspective as called for (Mouritsen, 2006), the study applies a practice theoretical approach with a focus on the performative practice in organizations, such as ‘doings and sayings’ of the organizational practice (Nicolini, 2012). From the realm of practice theories, the community of practice (CoP) theorising by Wenger (1998) is applied in order to study the practice community as a place for the creation of learning, knowledge, and IC. Of concern in the study is thus how the IC practice and IC value creation processes are highly dependent on the engagement and meaning negotiation in CoPs. This enables the answering of the following research question:

How can IC practice and IC value be created as an intangible asset in tangible-intangible dynamics in communities of practice in the case of an SME?
To inform research by answering the research question empirically, a single case study of an SME is undertaken to explore the IC practice in this type of organization and how CoPs play a role to the IC practice and the value of it. The case in study is an SME producing convenience food and selling it to the end consumers via, for example, coffee shops and petrol stations. As part of a strategy to many double turnover, the organization emphasizes the integration of knowledge from design management in the organizational practices. In doing so, the organization aims at developing IC practice as a valuable process. This forms the basis for an exploration of IC practice in an SME.

2. Theory

2.1 IC practice and the interdependent dynamics of tangibility and intangibility

Among various definitions of IC, the interest in the difficulty with the value measuring potential of IC seems intrinsic in many IC definitions. For instance, Sveiby (1997) concludes that IC is the gap between the market and the book value of the firm, and Martines-Torres (2006) underpins IC as not being present in the organization’s financial statements even though it may account for up to 80% of the company’s market value. However, these approaches to IC value are considered insufficient (Mouritsen et al., 2001).

Following a literature review of IC by Martín-de-Castro et al. (2011), definitions of IC are many but do have the following three characteristics in common: its intangibility, its potential to create value and the growth effect of collective practice and synergies.

However, scholars also found that among the several studies of IC dealing with intangible assets, there are divergent opinions as to whether the concept of IC can be defined synonymously with intangible assets (Osisnki et al., 2017). For instance, Castilla-Polo and Ruiz-Rodríguez (2017) present IC and intangible assets as synonyms and underline intangible assets as key to achieving business success by, for example, having the ability to innovate and launch new products on the market. In turn, Marr etel. (2004) consider the interdependency of tangible and intangible resources of an organization worth scrutinizing for further conceptualization.

A great deal of research on IC has emphasized IC as human capital, relational capital and structural capital (Cuganesan, 2005), and studies have been undertaken to define and measure quantitatively relational capital, human capital and structural capital (e.g. Hosseini and Owlia, 2016, Miciu, 2016, Hejazi et al., 2016). These measuring methods are, as stated, criticised for not measuring the full value potential of IC as an intangible asset. In the same vein, Marzo and Scarpino (2016) suggest that dividing IC into relational capital, human capital, and structural capital reflects a static approach with a narrow quantitative focus. Rather, Marzo and Scarpino’s (2016) claim, focus on activities and processes for understanding IC practice from a dynamic IC view is needed. The dynamic IC view emphasizes quality being the identity of resources and their relationships, as IC is mobilized in activities. Further, this dynamic view fits SMEs due to their informal systems and low hierarchies.

Thus, in recent scholarship it is acknowledged that IC research needs to study IC in activities and processes in organizational practice to understand IC practice “in action”. In order to address this gap in research, the current paper follows the dynamic IC view. Hence, the paper does not seek to achieve static descriptions of the economic value of IC, as research on this topic is immense. As an alternative, the paper studies the IC practice in practice and how IC is related to value as both a tangible and intangible asset. This qualitative account and the exploration of IC practice in the case of an SME are new to research.

2.2 CoPs as a place for the process of IC practice and IC value creation

As a performative approach to study IC practice is called for (Mouritsen, 2006), the study applies a practice theorizing approach (Nicolini, 2012, Schatzki, 2001). Practice theory implies “a performative perspective to offer a new vista on the social world” (Nicolini, 2012, p. 7). Studying practice is grasping processes and activities as they happen, and this can be done by studying ‘doings’ and ‘sayings’ in organizations (Schatzki, 2002). With this as a stance, practice theory enables the study of IC practice from the dynamic IC view considering the process of IC value creation.

Thus, practice theory and knowledge management have to some extent common roots in terms of the process ontology. Considering knowledge social and processual, practice theory scholars define knowledge as knowing in practice (Nicolini, 2012, Schatzki, 2002, Wenger, 1998), which resembles the dynamic IC view.


According to Wenger (1998), the concept of practice “is first and foremost a process, by which we can experience the world and our engagement with it” (Wenger, 1998, p. 51), and as practices of collective learning evolve over time in a kind of community, those are CoPs (Wenger, 1998). A CoP has been defined as “groups of people informally bound together by shared expertise and passion for joint enterprise” (Wenger and Snyder, 2000, p. 139) – a definition reflecting Wenger’s reluctance to define the concept too narrowly. A CoP is characterized by the following: mutual engagement, joint enterprise, shared repertoire, and meaning negotiation in practice. However, Nicolini (2012) claims that, simply, the study of shared practices is preferable rather than studying if organization members have fulfilled criteria for having formed a CoP. Also in recent knowledge management scholarship, it seems widely acknowledged that a CoP is a place for learning and knowledge creation (Aljuwaiber, 2016). Further, the CoP was found useful to develop positive organizational outcome and, specifically, a relevant place for development of human capital and social capital (Manuti et al., 2017). The interaction of social capital and human action were further found mediated in the CoP (Abou-Zeid, 2007). Research has thus been conducted to investigate the role of CoPs and IC from the static IC view. However, as stated above, a practice-based and dynamic IC view on the CoP as a place for the creation of IC practice and IC value is needed.

Despite the definition of IC by O’Donnell et al. (2003), in which it is intrinsic that IC also is created dynamically in the CoP, few scholars have studied the two concepts in combination. The dynamic definition underlines the value creation potential of IC as highly dependent on communicative competence among the members of the CoP. In continuation, one may say that the communicative competence is also crucial to the creation of new CoPs. Such a cultivation of new CoPs could be necessary to foster new knowledge (Wenger et al., 2002). And learning across CoPs was found to be potentially difficult due to conflicting epistemic cultures (Mørk et al., 2008). Since it is widely acknowledged that CoPs are informal by nature and differ from, for example, a formal team (O’Donnel et al., 2003), research needs to be conducted on IC practice and IC measurement practice in the borderland between CoPs and formal organizational structure. Applying this leads to attention as to how relations to practice IC are established and meanings of IC practice and IC value are negotiated across formal departments.

3. Methodology

The study is conducted as a case study, which is an empirical inquiry that enables in depth study of a complex issue in its real-world context (Yin, 2014). The approach offers the opportunity to learn from a single case (Yin, 2014, Stake, 2005), and it is adopted to study IC practice “in action” and how IC is developed in CoPs. Further, case studies are suitable when answering “how” and “why” questions (Yin, 2014) as in the current study.

In order to answer the “how” and “why” research question, the aim of the analysis is to build explanations about the case. Thus, the aim is to explain how things happen and build explanations as to why (Yin, 2014). Explanation building reflects initial theoretical propositions that form the basis for examining the case study evidence with the theoretical propositions in an iterative process (Yin, 2014). In the current case study, the theoretical propositions outlined above from IC theorising and CoP theorising have initially formed the ground for choice of case, data collection and data analysis. This methodology is outlined in the following.

3.1 Choosing a case to study IC practice in an SME

The case organization is chosen due to its strategy to implement knowing about end consumers in organizational practices. This knowledge and IC practice is to be developed by a design manager. In doing so,
the organization attempts to increase the level of IC among all organization members. As the study of IC practice in an SME is the aim of the current study, the chosen case is suitable for answering the research question. Further, the case in this study is worth examining because SMEs in particular have knowledge-based value-creating potential (Marzo and Scarpino, 2016).

The SME is employing a person holding a master of arts degree in design management. With this degree, this employee has her educational background within humanities and art, which is said to be of importance to business (Darsø, 2004, Irgens, 2014). However, a debated question is whether art is of economic value at all, and, if accepting it as economic value, whether it is so as a tangible tool (Darsø, 2004) or an intangible special way of being and acting (Irgens, 2014). This outline of art in business resembles discussions in literature on IC. First, in discussing whether or not art and IC are of economic value to businesses. Second, in discussing if art and IC are tangible or intangible assets. Third, both literature on art in management and IC theorising, as stated above, call for insights on how and why art and IC is practiced in organizations. As the case of the current study is an SME aiming at integrating art and humanities is the organizational practice, the case offers insights into IC practice and the value creation process of IC practice.

3.2 Collecting data to study IC practice in the SME

In the case, qualitative data is collected due to the “how” research question (Yin, 2014). The case study approach also fulfils the methodological requirements from the practice theoretical approach calling for other data than surveys and interviews (Schatzki, 2002). Thus, the research questions and the theoretical propositions pave the way to collect qualitative data as observations and interviews. As the object of study is the IC practice and how it is related to CoPs and as the case organization aims at implementing the knowing from design management as IC practice, the primary respondent and unit of analysis in the study is the employee holding a master’s degree in design management. Thus, it is an embedded case study design (Yin, 2014), as this enables the study to focus on IC practice creation.

Consequently, the first interview was conducted with the design manager and her manager, the innovation manager. As the study went on, other organization members related to the the design manager in the organization were interviewed in order to explore to their IC practices and how they approach IC practice IC value creation. Thus, the following nine interviews were conducted: two with the CEO, one with the innovation manager and the design manager, two with the design manager, one with the product developer, one with the chief performance officer (CPO), one with a sales manager, and one with a production manager. Interviews lasted 45 to 60 minutes each and were audio-recorded and transcribed in order to enable an analysis of the meaning and interpretation hereof (Kvale and Brinkmann, 2009). The interviews were conducted as semi-structured acknowledging the strength of fluidity in the qualitative interview (Yin, 2014).

Along with the interviews, twelve days of participant observation was conducted (Yin, 2014, Spradley, 1980). Observations gain access to “everyday” settings in organizations (Yin, 2014) and thus to study what happens in the organization. Mainly, the design manager was observed in activities related to the development of IC practice. Thus, the method of observation was participant observation (Yin, 2014) with the researcher being a participating observer or observing participant (Spradley, 1980, Bøllingtoft, 2007) depending on the activity taking place. Observations and interviews were conducted and carried out from an interactionist approach (Järvinen, 2005, Järvinen and Mik-Meyer, 2005), allowing a dialogue and thus benefitting from the qualitative research being open to what happens in the case. In doing so, the study applies a relativist and interpretivist perspective (Yin, 2014) to capture the perspectives of different organization members as a method to investigate how and why these nuances illuminate IC practice and IC value in the case.

3.3 Analysing data

With the theoretical propositions having shaped data collection, also data analysis follows the strategy of relying on theoretical propositions, comparing them with findings, and revising the propositions in more iterative processes as a way of building explanations (Yin, 2014). Thus, systematic and theme-focused coding occurred (Miles et al., 2014) in an iterative process with the codes based on the conceptualization of IC and CoP.

Code operationalization of IC was based on the conceptualization IC practice as implementing the practice of design management as either a special way of being and acting in the world (Irgens, 2014) or a tool (Irgens, 2014, Darsø, 2004) resembling the intangible-tangible dimension of IC. Considering IC practice a tangible and
intangible interdependent relationship, the data analysis of IC was based on two codes: IC tangibility and IC intangibility. As IC practice in this case is studied as design management practice, coding was operationalised by coding interviews and observation notes by finding quotes about design management, which was then coded as either tangible or intangible. This was used to grasp IC practice and the tangible-intangible interplay hereof.

As the study explores how IC practice is – and can be – developed in CoPs, there are also codes deriving from Wenger’s (1998) CoP conceptualisation. Thus, CoP codes were: mutual engagement, joint enterprise, and shared repertoire, as they are the constituting elements in a CoP (Wenger, 1998). Coding interviews and observations in this manner enables a study of CoPs between the design manager and other organization members. In combination with the coding of IC this paves the way to analyse the relation between IC practice and CoPs. The findings sections present, based on CoP coding, the three most significant attempts made by the design manager to engage in CoPs and, using Nicolini (2012) phrasing, share practices.

4. Findings

First, the analysis shines light on the IC practice from a management and design management perspective. Next, the study explores the role of CoPs for IC practice and IC value creation. Finally, the analysis explores how IC practice and the value of IC practice is negotiated differently depending on the attempts to engage in CoPs.

4.1 The process of IC practice and IC value creation in the SME from the perspectives of the CEO and the design manager

To the CEO, employing the person with a master’s degree in design management is a part of a strategy to bring the company to the next level of development with a highly-increased turnover by among other things integrating design management approaches to the organizational practices, which he states in the table below.

Table 1: Quotes from the CEO and the design manager about design management practice in the SME. Structured by author as tangible and intangible IC practice assets.

<table>
<thead>
<tr>
<th>Design management as: Quote(s) by:</th>
<th>Tangible IC</th>
<th>Intangible IC</th>
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<tbody>
<tr>
<td>CEO</td>
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<td></td>
<td>Product quiz</td>
<td>&quot;We will implement this design thinking and always take the view of the end user. We are going to move away from the traditional mass communication of products to developing products with the end users, and thus we want to create needs that the end consumer did not even know that (s)he had.&quot;</td>
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<tr>
<td></td>
<td>Persona project involving a cardboard figure of the typical end consumer</td>
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<tr>
<td></td>
<td>User samples (interviews, questionnaires)</td>
<td></td>
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<tr>
<td>Design manager</td>
<td></td>
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</tr>
<tr>
<td></td>
<td>User samples (interviews, questionnaires)</td>
<td>&quot;We have enough chairs in the world, so the designer will look behind the product and consider the values of the product, the person using it and the problem [that the product solves].”</td>
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<tr>
<td></td>
<td>Product DNA</td>
<td>&quot;[Design management is] understanding the end consumer and being at the deep end for a long time.&quot;</td>
</tr>
<tr>
<td></td>
<td>Product quiz</td>
<td>&quot;[Design management is] exploring the values of a product in order to sell more of it.”</td>
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<tr>
<td></td>
<td>Persona project involving a cardboard figure of the typical end consumer</td>
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<tr>
<td></td>
<td>Puzzle to gather knowledge on the end consumer</td>
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<td></td>
<td>Creative work with sales persons</td>
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With the quote, the CEO outlines how IC practice is intended to entail intangible knowledge about the end consumer buying the tangible products of the company (i.e. convenience food). To the CEO, implementing a design management strategy, or “design thinking”, involves the development of all organization members having a work practice that is always the most well suited to creating most value to the end consumer buying and consuming the products. This should be done by integrating the intangible knowing from design management in the practices of organization members. The value of IC practice is thus intended to be related to products better appealing to customers with an increased sale thus. As the CEO states, the intangible
knowing will be mediated or communicated in the organization via tangible tools such as quizzes for the organization members to learn more about the end consumers and cardboard figures to represent who the customers are.

Changing the practices of all organization members is thus a matter of developing IC in the sense of the dynamic IC view considering IC an intangible asset that is more than abstract knowledge, namely a system of knowing activity (Marzo and Scarpino, 2016). To the CEO, hence, it is important to increase the level of IC and changing the way of knowing among organization members by basing their activity and tangible output on intangible knowing about the end consumer.

This new strategy should be seen in the following light: By the foundation of the case organization, it was considered a “craft firm” employing mainly blue-collar workers. Hence, the attention in the company has mainly been paid to the tangible output: convenience food. In order to comply with this historic tradition and cultural trait, the intangible knowing is mediated through tangible objects such as products quizzes and cardboard figures.

The design manager is responsible for developing this new knowledge and changing practices accordingly. Following the design manager, the intangible part of design management is strongly connected to product development by focusing on, for instance, the value of a product and not solely on the product itself. This IC practice reflects IC as intangible and related to the tangible products.

Considering the quotes from the design manager to be new to the organizational practice, the tangible part of design management is formed by tools to both create knowledge about the end consumer and to share it with other organization members in order for them to integrate the same knowing about the end consumer in the activities constituting their practice. Using questionnaires and interview guides is thus a way to generate knowledge about the end consumer in terms of norms and values and the end users’ problems that the company’s products may solve. By assessing the data, the design manager is to develop intangible knowing about the end consumer. Using the so-called product DNAs, products quizzes, cardboard figures, and puzzles is a way to enable other organization members to achieve the same knowing about the end consumers and achieving this in the activities that form their daily practice.

Hence, the study finds that the SME intends to create IC value with knowing about abstract end consumer phenomena to be integrated in organizational practices of producing the tangible output.

4.2 Attempts to engage in CoPs for IC practice and IC value creation

The design manager is expected to be the key driver in the development of IC practice by sharing knowledge to change activities and practices throughout the organization towards the end consumer. The analysis of the data with attention to CoPs in the case shows three attempts by the design manager to engage in CoPs with other organization members, which is elaborated in the following. As Nicolini (2012) suggests, the central point when studying CoPs is not to judge on the CoP based on Wenger’s (1998) criteria. Rather the central point is the shared practice, which the analysis shines light on to scrutinise how CoPs and shared practices influence the process of IC value creation.

First CoP attempt: The innovation department

The design manager is formally organized in the innovation department, which also consists of an innovation manager and a product developer. They are responsible for the innovative product development process and they manage the intangible-tangible interdependency of product development. With regard to the practice of the design manager and the value-adding intangible character to the tangible products, they claim the following:

Jill [the design manager] knows how to draw and analyse our complex processes [in product development]. (Quote product developer)

The design manager will be the one to ask critical questions and be the devil’s advocate [in product development]. (Quote innovation manager)
From their point of view, the value of the intangibility is added in the practice of having process overview and being able to ask critical questions when developing products. As the product developer and innovation manager are chef and baker by education respectively, their quotes point to their sharing and creating new IC practices with design management that adds intangible knowing to a practice highly occupied with a tangible output. As their shared practice and CoP like relation is a result from their formal organising in the same department rather than an informal engagement, one may say that it is not a CoP. Of importance, however, is their shared practice, even if it is not informal as called for by Wenger (1998). Their sharing practices points to their knowing how to combine practices as the basis of value creation.

**Second CoP attempt: The “food pilots”**

The concept of “food pilots” has been introduced in the organization to integrate the knowing from design management in other organizations members’ activities. One way to do this is to involve “food pilots” in data collection about end consumers to a new product. The “food pilots” are managed by the design manager. Aside from the design manager, the product developer from the innovation department and four blue-collar workers also participate. The participation of sales person was also planned on; however, they did not have the time to join.

Observing the activity on that day began in a meeting room with the design manager presenting the products and questionnaires used to collect data about the product and the end consumers. The food pilots are to give test samples to people in the shopping street in the nearby city centre and ask questions about the product’s qualities and the person in question.

In doing so, the design manager and the food pilots have made attempts to share practices and to fulfil the criteria of having a CoP by developing a shared repertoire, mutual engagement, and joint enterprise (Wenger, 1998). Further, the concept of meaning negotiation (Wenger, 1998) is observed in the practice of the design manager and the food pilots by the following activity:

> **Before going to the city centre, the design manager presents the products and the questionnaire to the food pilots. Questions and comments are regularly posed by the food pilots. Interestingly, the questions are often answered by the product developer, who also complements some of the points of the design manager. (Vignette from observation notes).**

Thus, the CoP among the food pilots and the design manager is promoted by the product developer being a knowledge broker enabling the crossing of boundaries and the introduction of tacit knowledge into other CoPs (Wenger, 1998). Referring to the day of data collection among the food pilots and the innovation department, the product developer utters:

> **Yes, on that day the designer and the food pilots met for the first time a whole day, and my strength was that I know them personally. Therefore, I know how Mike needs to get things explained and I know how Di needs to get things explained to understand them. Afterwards, the designer told me how happy she was about how things went on that day, things were just flowing. And I agree with that; it was a really good day. (product developer)**

Having shared histories (Wenger, 1998) with the blue-collar workers as a former member of the formal production department and current member of the formal innovation department enables the product developer to hold multi-memberships of both two CoPs. Thus, as Nicolini (2012) would phrase it, she knows how to interact with different “knowings” and helps to share practices. This paves the way for developing IC practice as an asset in the daily activities and practices of the food pilots.

However promising, among the food pilots are, besides the design manager and the product developer from the innovation department, employees from the production who are blue-collar and wage-earning employees. Thus, they have allocated paid working hours to be a food pilot and attend the workshop. The idea, though, was to integrate members from the entire organization in the food pilot project to create knowledge about the end consumers throughout the organization and integrate the intangible knowing about the end consumers into all practices and knowings of the organization. Despite these intentions, no white-collar workers attended. Thus, the attempts to create shared practices and CoPs with the food pilots is only enabled by the formal structure. This limits the IC practice in the SME. As the study in this section shows, a CoP is a place to develop
IC practice. However, it also finds that in this case, it only emerges from the formal structure, as this is the case with the innovation department and the food pilots.

**Third CoP attempt: The sales persons**

As stated above, no sales persons joined the food pilot group. Instead, an attempt was made by the design manager to share the IC practice with the sales department when conducting a one-hour workshop for the sales department.

The workshop takes place four months after the workshop with the food pilots, and the data from that day is among the data that has been processed to develop a so-called persona representing the typical end consumer of a given product. The aim of the workshop, as part of the organizational strategy, is to let the sales persons know who the end users are and what they are like. This is to help them sell the products.

*The design manager introduces various artefacts, and she structures the workshop as a quiz, asking the sales persons to physically create the end consumer as a paper figure based on questions posed by the design manager about the characteristics of the persona related to the given product. The sales persons had to guess the persona of a new product by building a physical figure of the typical end consumer. It seems that the sales persons answer questions related to persona characteristics wrong. [...] A sales person questions the reliability of the answers of the end users. (Vignette from observation notes).*

The sales persons are thus doing the quiz as intended by the CEO and design manager as a way to integrate abstract knowing about the end consumer in their practice. The study finds that the workshop is an attempt to develop a CoP and share knowings and practices with the aim of integrating the knowing from the design management practice into the sales practice. However, many features from a CoP are missing.

First, there is no knowledge broker attending the workshop. Next, there is to some extent mutual engagement when they are doing things together and there is an attempt to develop a shared repertoire, since they are working with tools and artefacts (Wenger, 1998). However promising, they are only working for one hour, and this might limit the development of a joint enterprise in terms of achieving negotiated enterprise, mutual accountability, interpretations, rhythms, local response (Wenger, 1998).

The design manager and sales persons seem to have divergent assumptions about the characteristics of the end user. Thus, one of the things to negotiate would be the end user, since a sales person also expresses doubt about the trustworthiness of the answers of the end users. In the sharing of practices, thus, the mutuality is important, and this may be underestimated by the CEO and design manager in the process of creating new IC practice. Rather than sharing practices, the study finds that it is mainly the design management practice that is shared with the sales persons.

4.3 The value of IC practice negotiated in CoPs

Initially, the study found how the development of knowing about the end consumers in all organizational practices is expected to be of economic value. In this section, the analysis explores to what extent other managers negotiate the value of IC practice.

**Table 2: Managers’ quotes on design management**

<table>
<thead>
<tr>
<th>Organization member</th>
<th>Quote on design management</th>
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<tbody>
<tr>
<td>Innovation manager</td>
<td>“Once we know how to integrate the knowledge about the end consumer into the organization, we become rich.”</td>
</tr>
<tr>
<td>Production manager</td>
<td>“We do not need the persona project to focus on the end consumer; I think the people in the production department know who they [the end consumers] are, but creating knowledge across the organization is good.”</td>
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<tr>
<td>CPO</td>
<td>“We just need to agree that we always have to focus on the customer, but we do not need design thinking to administer it. That may simply be common sense.”</td>
</tr>
<tr>
<td>CEO</td>
<td>“Now Bob [CPO] is more positive [towards design management] because he sees the results on the bottom line.”</td>
</tr>
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Comparing these quotes with the findings above regarding the interactions between design management and other organizational units, the study finds that where there is interaction to share practices, there are positive
negotiations of the value of design management. For instance, the innovation manager utters a positive view on the value of IC practice of integrating knowledge about the end consumer in the organization.

The table shows how the production manager and the CPO negotiate the value of the IC practice differently. In continuation, the study suggests that while the production manager and the CPO negotiate the value of the design management negatively, it is not due to negative evaluation of knowledge about the end consumer to the organizational practice. Rather, the production manager expects the knowing of design management to be already part of the knowing of the practices of the employees in the production. The CPO, on line with that, considers the knowing of design management “common sense” rather than a knowing.

Thus, the CPO and the production manager acknowledge the importance and value of having practices that are suitable for accomplishing activities in a way to meet the needs and demands of the end consumers. They acknowledge the value of the IC practice, but do not consider it a knowing. Rather, they consider this part of existing practices in the organization and not a practice that is founded design management as a specific knowing itself. Their view reflects a static view on IC practice and IC measurement practice, as their opinions point to the value of IC practice residing in all practices: IC practice is thus solely a sub-practice to a primary practice as e.g. production practice and the value of IC practice can only be measured as a sub-value to the value generated by the core practice of e.g. production practice.

In the table above, the CEO acknowledges this co-existence of different views on the intended value of design management, but underlines that, for instance, the CPO has over time become more positive, as he sees the results on the bottom line. However promising, the positive attitude of the CPO derives from positive results on the bottom line which confirms his static value evaluation of IC practice and this static IC measurement practice. Consequently, this study finds that despite great attention to develop a practice considering IC an intangible asset, the case organization has made no attempts to develop IC measurement practices with respect to the practiced dynamic IC view. Regarding the production manager and the CPO, the CoP theorisation would call for more interactions and shared practices between them and the design manager to negotiate the relevance and thus value of design management for their practices. As Wenger (1998) states, the aim is not heterogeneity, rather an exploration of the complexities of creating new practices with insights from other practices and knowings. This is a way to promote both IC value and IC practice.

5. Discussion

By conducting an in-depth single case study of an SME and by applying a practice theoretical approach, the study explored and gained new insights on IC value creation in practice. As it is a single-case study, knowledge from it cannot be generalised statistically, but it can be generalised analytically (Yin, 2014). Thus, both scholars and practitioners concerned with IC practice in SMEs aiming at developing IC practice and integrating new abstract knowing, from e.g. design management, may learn about the complex character of the value creation process of IC practice and the relation to CoPs.

For instance, the study found how IC is practiced as abstract and intangible knowing about values, norms and problems related to customers and products when manufacturing tangible products to achieve economic value. A further important finding is that this dynamic IC practice exists together with a static IC view. In this way, the study gains insights in to a case that moves away from what management scholars (e.g. Irgens, 2014) would consider the positivistic-rooted traditional management by also practicing management informed by the humanistic management approach, paying attention to more abstract phenomena such as customer values, norms and needs.

Creating a dynamic IC practice relies on turning the abstract knowledge asset, in this case design management, into a system of knowing activity, as suggested by scholars (Marzo and Scarpino, 2016). From a CoP perspective, this is done by establishing CoPs and sharing practices and knowings across formal organizational units. The study finds that IC is created in CoPs both in terms of developing IC practice and IC value. However, CoPs do not occur solely due to informal systems and low hierarchies that characterise the SME and the current case. Hence, the study finds that more efforts need to be undertaken to cultivate CoPs. A limitation of the study, which thus entails further research potential, is if enough has been done to cultivate these. Further, if some managers do not acknowledge the intended IC practice as a knowing as the CEO does, this may point
to lack of communication and interaction about the motivations of the CEO to implement design thinking in all organizational practices.

In the current case, IC is intended to be practiced as an intangible asset understood as abstract knowing integrated in practices. This, however, is a challenge to an SME that historically has paid attention to the tangible output. With respect to this cultural trait, much is done to turn the abstract knowing into tangible mediators of the knowing, e.g. product quizzes and cardboard figures. Nevertheless, as organization members and managers doubt the “value” of the abstract knowing of design management, one may ask, if this attention to turning the intangible into something tangible renders the value of the intangible knowing. In continuation, the study finds that lack of dynamic IC measurement practices promotes the view on IC not being an intangible asset.

6. Conclusion

An SME can develop value creating processes with IC practice as an intangible asset by combining abstract and intangible knowing about the end consumers with knowing about the tangible organizational output. The current case demonstrated that this can be done by integrating abstract knowing from the arts and humanities as, for instance, design management. This knowing can be integrated in the organization when organization members share practices and engage in CoPs with room for mutual meaning negotiation, which can be promoted by knowledge brokers. Developing IC practice in CoPs is a way to both integrate the abstract knowing in other practices, but also to increase the value of IC practice, as engagement in CoPs is a way to create new IC practice and to negotiate the value of IC practice. However, there are pitfalls to this development. First, it is important to share practices in a mutual engagement. Second, another pitfall concerns the tangible-intangible interplay of IC practice, as, one the one hand, communicating the intangible and abstract knowing of IC practice via tangible mediators as quizzes and figures promotes IC practice. On the other hand, though, this tangibility may render the intangible dimension of IC practice making it seem irrelevant and invaluable as a knowing. This limits both the organization-wide development of IC practice and the development of new ways of measuring IC practices reflecting the very dynamic and processual nature of IC practice creation. Rather than aiming at finding new IC measuring methods, the paper suggests that organizations may benefit from dialogue and negotiation among organization members as a way to explore the relation between IC practice and IC value to a given organizational practice. Third, CoPs do not emerge themselves, even if this may be expected in an SME with low hierarchies and informal systems. Rather, in the SME, IC practice development needs managerial attention both in terms of communication and formal structure to support sharing of practices in mutual engagement.

References


Manuti, A., Impedovo, M. A. & Davide De Palma, P. 2017. Managing social and human capital in organizations:


Identifying Layers of Intellectual Capital by Analyzing Unique Contexts

Darin Freeburg
University of South Carolina, Columbia, SC, USA
darf@mailbox.sc.edu

Abstract: This research analyzed the Intellectual Capital (IC) in churches, noting the contextually specific elements tied to unique definitions of success. It aimed to open up to questioning the traditional classifications of IC, while considering the importance of context. American churches were chosen to uncover unique layers and attributes of IC, as they represent a very different organization from those typically studied in IC research. The leadership teams of four churches engaged in 90-minute focus groups, where they discussed success, assets, liabilities, and attempts to leverage value from assets. By approaching it qualitatively, and without prompting participants about the traditional definitions of IC, a more valid and natural discussion revealed unique assets not found in other contexts. Analysis validated the traditional three-part classification of IC into human, relational, and structural assets, yet it showed unique subcategories not captured by previous research. It outlined unique relationships among asset classifications, and revealed areas of missed opportunity and leakage of assets. This adds to the growing list of possible specific IC assets that can be considered by other organizations, as well as ways to leverage these assets. Analysis also found that assets can easily become liabilities if not properly managed and maintained. This approach can be used in future research to uncover additional layers of IC that can be used by other organizations not previously aware of the existence or potential value of such assets.

Keywords: Intellectual Capital, Churches, Assets and Liabilities, Organizational Culture, Value Creation

1. Introduction

Research on Intellectual Capital (IC) suggests that intangible assets are important elements of value for any organization, and they tend to be categorized according to human, structural, and relational elements. Yet, because research has focused on a rather homogenous set of organizations, these categorizations are in danger of becoming stale. And due to the contextual nature of IC, the attempts to fit an organization’s assets into existing categories—rather than conduct an inductive analysis in their unique context—threatens the validity of the organization’s understanding of its assets.

Thus, the aim of the current research is to open up to questioning these IC classifications in a less prompted discussion of intangible assets with leaders in a unique context. In other words, by not overtly directing participants to the three categories traditionally used, it is possible to uncover a more valid discussion of an organization’s intangible assets that is not restricted by previous assumptions. Also, by focusing on a unique context—churches—the research can reveal more about the contextual nature of IC, adding to existing research on various types of organizations and potentially revealing new assets that could be of value to other organizations. The goal is to validate the comprehensiveness of traditional IC models and provide additional contextual and specific detail to models that have remained too abstract to be of much practical help in the management of IC (Kaufmann and Schneider, 2004). This additional detail comes by uncovering new specific assets, the connection of IC to organizational strategy, the processes put in place to extract value from these assets, and potential liabilities in these assets.

The multitude of definitions and classifications of IC have been noted as a problem for IC research (Kaufman & Schneider, 2004; Diefenbach, 2006; Choong, 2008). Diefenbach (2006) argued, for instance, that “the provision of several examples—as interesting and helpful this might be for gaining (new) insights—is not sufficient for a systematic investigation into the problem of identification, management and development of intangible resources” (p. 407). Yet, the current research argues that this ever-expanding list of IC assets is a product of their very complexity. And if organizations can themselves identify these various examples—namely the ones that matter to them—as well as liabilities associated with them, this should prove useful for contextually based identification, management, and development. Rather than suggest a new universal classification for IC assets, the current research seeks to extend the list of IC assets that can be used by other organizations to achieve strategic objectives. Context is important to the understanding of IC; thus, the current research explores the differences in IC based on context.
Although these came out of unique contexts, they may represent assets that other organizations have but have not known about and—thus—not attempted to extract and use. Some organizations may actually have some of these layers of capital, but professional and cultural constraints keep them hidden. Looking for ways to cross-pollinate IC research from various unique contexts ensures that models of IC do not become stale and self-confirming. This approach can lead to the development of subtypes within the three primary categories of IC, as well as completely new categories.

The following section will outline the literature related to these areas. After first defining IC and the models widely used to classify it, a discussion of the philosophical assumptions of the current research will highlight the need to consider context. Next, the various elements of IC important to the current study are outlined. This includes an outline of how an organization identifies IC assets that are strategically important, the processes put in place to leverage these assets, and liabilities. The review of the literature includes an overview of the IC found in vastly different contexts. This will be used to identify the elements of the church context that mark it as unique and add to what is known about IC.

2. Literature Review

Intellectual Capital (IC) emerged as a response to the recognition that differences existed between an organization’s accounting value—its financial and physical value—and its market value (Stewart, 1997; Marr, Schiuma, & Neely, 2002). Thus, it was possible to calculate IC as the difference between these two values. However, this is a "questionable" way to view IC, as "IC does not comprise the entire difference between market and book values" (Dumay, 2009, p. 192). Therefore, a more robust definition of IC is needed. This definition begins with Stewart (1997), who defined IC as "the intellectual material—knowledge, information, intellectual property, experience—that can be put to use to create wealth. It is collective brainpower" (p. 12). Yet, wealth cannot be the only end to this intellectual material. It also includes the components of a) value, b) strategy, and c) action.

Several models of IC assets have been proposed. See Andriessen (2004a) and Choong (2008) for rather comprehensive reviews of IC assets noted in the literature. Included in these asset categorizations are market and infrastructure (Brooking, 2010); employee competence and structure (Sveiby, 1997); organizational and human (Guthrie & Petty, 2000); innovation expenditures (Bounfour, 2003); and process and technology for knowledge codification (Mouritsen et al., 2002, p. 21). Yet, Marr and Adams (2004) suggest that they all tend to converge toward a “three-pronged overall framework” consisting of human, relational, and structural capital (p. 22).

- **Human Capital** is the “lifeblood of the intellectual capital concept” (Marti, 2001, p. 155). It includes the skills, creativity, leadership, and general knowledge and problem-solving capabilities of an organization’s employees.
- **Relational capital** includes the intangible element of interaction, and encompasses an organization’s external relationship with its customers and its internal social networks (Marr, 2008; Marti, 2001). It encompasses relationships with key stakeholders (Marr and Adams, 2004).
- **Structural capital** establishes important norms and ways of behaving (Marr, 2008). It includes culture, practices and routines, and intellectual property (Marr, 2008). It provides the common ground for individuals within an organization to interpret events, the tacit or explicit ways of operating that can be valuable to the organization, and the intellectual property over which an organization has legal rights (Marr, 2008).

There is impetus for moving beyond this, however, to account for contextual differences in IC. Andreou, Green, and Stankosky (2007) looked specifically in high-tech firms and found subtleties in the IC model that allowed for additions to be made, most specifically in terms of how employees relate to Intangible Assets. Ramirez and Gordillo (2014) looked at Spanish universities and proposed an expanded model of 42 intangible elements that were “of relevance to university stakeholders” (p. 184).

The next section will first outline the philosophical position of the methodology. Next, it will outline, in turn, issues of value, strategy, and action that make-up the methodology. This includes research questions that make up the methodology and drove the case study.
2.1 Philosophical Stance

The philosophical stance of the current research must be outlined, as such a stance is “a critical success factor for research and management” (Venzin et al., 1998, p. 37). The current research is not an attempt to develop a better, more encompassing classification scheme for IC assets. Such an attempt assumes that one best picture of IC exists, and the goal of research is to identify more elements of this best picture. As this picture comes more into focus, organizations can engage in a simple matching game whereby their existing resources are mapped onto this best picture. This represents a cognitivist approach, whereby the world is predefined and, therefore, fixed (Venzin et al., 1998). An accurate picture—or knowledge—reflecting the absolute and universal truth of this world is achieved through the accumulation of external and objective data and information. Because the world is pre-defined and static, universal rules exist for how organizations can adapt to it as they place their increasingly accurate explicit knowledge of it into manuals, books, databases, etc. (Venzin et al., 1998).

Instead, the goal of the current research is to help organizations uncover IC assets that are unique to them. It uncovers how organizations themselves build their picture of the world, rather than attempting to fit them into an existing picture. This represents an autopoietic approach, whereby the world is not pre-defined. Knowledge does not build up as organizations accumulate more information and data about an absolute truth, but individuals within organizations subjectively build their own worlds, as “each individual has to create his or her own knowledge through experience” (Venzin et al., 1998, p. 42). The world is thus socially constructed as individuals with individual knowledge interact. This explains the vast variety of IC assets and differences in approach outlined in the literature, without suggesting the supremacy of any one.

Kaufman and Schneider (2004) argued that such an approach lacks practicality, as it fails to “inform the user as to which special components of a firm’s intangibles are important to its strategy” (p. 379). Yet, the current research suggests that a qualitative approach is precisely what allows for the uncovering of these special elements in a way more directly tied to an organization’s unique strategy. Choong (2008) similarly criticized qualitative investigations of IC, suggesting that they “fail to offer any objective measurement usefulness” (p. 632). However, the current approach follows the line of interpretivist research, “grounded in people’s self-understandings,” which suggests that “all observation is theory- and value-laden and . . . investigation of the social world is not, and cannot be, the pursuit of detached objective truth” (Leitch, Hill & Harrison, 2010, p. 69). Unique assets not captured by existing frameworks may be overlooked without an inductive methodology for uncovering the assets and liabilities in specific organizations.

2.2 What Knowledge and What Value?

Not all brainpower in an organization is considered valuable capital. Organizations have vast knowledge resources, but IC includes only that knowledge which provides value. It is “knowledge . . . that produce or create value” (Marti, 2007, p. 245). It is “knowledge that can be converted into value” (Edvinsson & Sullivan, 1996, p. 358). IC includes “all non-tangible resources that . . . contribute to the delivery of the organization’s value proposition” (Marr, 2008, p. 5).

Yet, what is the nature of this value? Although value may be attached to financial returns, as noted previously by Stewart (1997), it is much more than this: “A value reflects the concept an individual or group has regarding what is desired” (Andriessen, 2004a, p. 237). The value of IC is tied to organizational strategy, i.e. how does an organization define success? This link is important: “Strategy development based on the company’s valuable knowledge is likely to lead to sustainable competitive advantage” (Venzin et al., 1998, p. 31). A successful organization “recognize[s] that intellectual capital is a major source of value and leverage” (Edvinsson & Sullivan, 1996).

The questions of what knowledge is valuable and what that value constitutes is likely different in nonprofit organizations (NPOs) like churches than in for-profit businesses. The goals of NPOs is the providing of services rather than profit. These groups have “an embedded social purpose” (Austin, Stevenson, and Wei-Skillern, 2006, p. 1). These organizations also face unique challenges, highlighted by Prugsamatz (2010) as including declining trust from the public (Herzlinger, 1996) and for-profit organizations claiming part of the non-profit space (Kong, 2014).
Thus, IC is valuable to churches to the extent that it contributes to success as they define it. To that end, the study asks the following:

RQ1: What are the value propositions and strategic goals of churches?
RQ2: What IC resources do churches consider valuable for achievement of their strategic goals?

2.3 What Actions and What Liabilities?

To say that IC is knowledge that can increase value is not to say it does so automatically. Processes must be put in place to leverage value. Halawi, Aronson, and McCarthy (2005) reiterated that what organizations do with knowledge—how they process it—is part of their success. Edvinsson and Sullivan (1996) argued that “the existence of a stock of knowledge (intellectual capital) is not enough to account for the high value the marketplace puts on many knowledge companies. Indeed, it is the ability of companies to leverage their intellectual capital that is perhaps a greater key to profitability” (p. 357).

Without a clear understanding of such leveraging, organizations are left merely taking stock of where resources are. Marzo and Scarpino (2016) argued that the simple categorization of many IC efforts leads to a static, rather than dynamic, notion of IC that does not account for how organizations leverage these assets. Dumay (2009) also argued that existing IC frameworks re-create static representations of IC without addressing the praxis of IC (p. 194). It is important to look at “how [IC] actually works and evolves in practice” (Schaper, 2016, p. 54). Caddy (2000) noted that it is this very move from potential value to measurable value that turns intellectual assets into intangible assets (p. 131).

To say that knowledge requires action to be valuable is to suggest that a lack of action invites lost value. In this way, organizations can look at liabilities in their IC assets, i.e. areas of lost opportunity and leakage of assets. Rather than assume that all the IC discussed in an organization is fully realized, Caddy (2000) asked, “What happens if this belief [of conversion of IC into revenue] is not realized either in terms of something less than the full potential of the intellectual capital, or in the worst case not being realized at all?” (p. 133).

De Santis and Giuliani (2013) provided a comprehensive review of research into liabilities, concluding that research into liabilities is “very scarce and highly fragmented” (p. 222). Some authors have pushed against what they see as an overly optimistic view of IC, analyzing the potential for IC to destroy value rather than create it (Dumay, 2013; Garcia-Parra et al., 2009). Dumay (2013) noted that many of these positive effects are unproven. IC can deteriorate (Harvey and Lusch, 1999), and emotional liabilities can deactivate it (Abeysekera, 2004). Garcia-Parra et al. (2009) looked at various intangible obligations an organization has for its employees, e.g. job security, recognition, and acquiring knowledge. The inability of an organization to fulfill these obligations “may induce changes in employees’ work attitudes, which in turn reduce their contribution to organisational processes and activities” (p. 826). IC is, thereby, depreciated. Managers must “monitor and manage intellectual liabilities in order to control the possible negative effects generated by IC” (Dumay, 2013, p. 7). Thus, it is important to consider the ways in which these assets may be harmful, not simply assuming value creation.

RQ3: How are churches attempting to leverage IC to achieve strategic value
RQ4: What liabilities exist in a church’s IC assets?

2.4 Context

Context is important to consider in IC, which is one of the reasons for opening up the three existing categories to discover nuances and potentially new categories in different contexts. Kianto, Humelinna-Laukkanen and Ritala (2010) noted that certain elements of IC should be more important for different organizations. They found, for instance, that human capital was more important to service firms than those firms that provide products. An exhaustive literature review of the various contexts analyzed by IC researchers is beyond the scope of the current research. However, several are included to highlight the potential differences in the church context.

Key IC assets in an Italian automobile component manufacturing firm included knowledge about procedures, relationships with outsourcers, and codification and formalization of knowledge (Marzo & Scarpino, 2016). Development of IC theory in nursing suggested that key assets include knowledge and skills gained through
formal education, and possession and use of best practices and protocols (Covell, 2008). Key assets in a public university hospital included the number of professionals and researchers employed, and the development of agreements with local providers about how to provide health care services for the area (Vagnoni and Oppi, 2015). Key assets of banking institutions in Luxembourg and Belgium included the use of information systems related to automation, creativity for innovation, and frequent interaction with customers (Mention & Bontis, 2013). Key assets of insurance firms in Iran included formal education, diversity of product portfolio, and market share (Zakery & Afrazeh, 2015). Key assets of global pharmaceutical companies include patents, databases, and technology; relational capital in reference to customers is briefly noted in the balance sheets of these companies, and human capital is missing entirely (Boekestein, 2006).

2.5 The Problem

The previous section outlined the pertinent literature on IC. This included its definition and classification into human, structural, and relational assets. More specifically, the current research is concerned with what IC assets are considered strategically important, realizing that not all assets can be prioritized and leveraged. This requires a deep understanding of an organization’s definition of success. In addition, the current research is concerned with the actions taken to leverage these assets in a way that they can contribute to this definition of success. This includes potential liabilities that must also be considered. The autopoietic stance of the researcher paves the way for an inductive look at elements of IC that are unique to specific contexts. The variety of organizations previously referenced outline the importance of context. This paves the way for addressing the aim of the current research to consider the potential of new categories of IC and the relationship of these to context.

3. The Methodology

The current research was approached within an interpretivist framework, which matches the autopoietic assumptions noted previously. This approach rejects assumptions of objectivity and generalization in positivist or post-positivist research (Byrne, 2001). It also allows for a richer analysis of subtlety, where the most important elements of the findings are expected to come from: “The interpretive paradigm is one that thrives upon subtlety, it is one where hidden and important meaning is buried” (Black, 2006, p. 320). More specifically, this involved a multi-site case study and data collected through focus groups (FG). Case studies provide “in-depth analysis of a case” (Creswell, 2014, p. 14). Although they are limited in their generalizability, it is still possible to look at the implications the findings of a particular case study have for other contexts: “The process . . . is transferable even when the [case] may be different in content and context” (Simons, 2009, p. 166). FGs allow the leaders of an organization to analyze strategy and assets together, guarding against standpoint epistemology—the assumption that, when isolated individuals say similar things, they necessarily agree with one another (Kamberelis & Dimitriadis, 2011). Instead, participants can correct and challenge one another to produce more valid data.

This approach increases rigor in what have traditionally been practitioner-based models of IC (Andriessen, 2004b). The empirical framework of the study opens the concept up to nuance and validation from rigorous qualitative research methods. Thus, following Andriessen (2004b), it is more explanatory science than design science, as it seeks—not to intervene for improvement—but to identify potential additions to the IC model from churches that might be predictors of success in other organizations.

While Choong (2008) attempted to reclassify IC using a review of existing literature, the current study seeks to reclassify IC through qualitative data collection in a specific context. It is an inductive approach fit within the loose framework of existing models. This follows the decision by Habersam and Piber (2003) to “explore the IC in hospitals” using qualitative measures rather than attempt a “comprehensive understanding of IC” (pp. 757-758). They similarly used an existing taxonomy as a “heuristic” that “may also be subject to development itself” (p. 758).

3.1 Process

An email was sent to pastors in the area to inform them of the study and inquire about potential participation. Face-to-face meetings were held with the pastors of four churches who responded to this initial email. Each pastor was asked to gather a group of 6-8 individuals considered to be part of the Leadership Team to gather for a 90-minute focus group. Involving church leadership answers the call from Steenkamp and Kashyap (2010) for more contributions from management about the perceptions of IC. Brooking (2010) also found that
management estimates tend to be just as accurate as other forms of assessment. A total of 28 individuals from these four churches participated in the FG. They represented an equal selection of male and female participants, ranging in age from 20s to 70s. They were predominately Caucasian, representing the make-up of their respective churches. Three Mainline Protestant denominations were represented, including the Evangelical Lutheran Church in America (ELCA), United Church of Christ (UCC), and United Methodist Church (UMC). This is a sufficient sample size given that the coding categories remain relatively consistent across each church, suggesting that additional churches were not adding significant themes to the research, i.e. “no new information [was] obtained” (Morse, 1995, 147).

3.2 Focus Groups

During the focus group, participants were asked to outline what success meant for the church, i.e. what were their objectives? This provided insight into RQ1 about value propositions and strategic goals. They were then asked to imagine that a construction company had accidentally demolished their building, and they had lost all financial assets in a bad investment. With this projective in mind, they were asked if and how they would be able to still achieve success. This provided unprompted insight into what participants viewed as their essential intangible assets as they related to their specific objectives. This provided insight into RQ2 about strategically important IC, and also provided the richest data in terms of moving beyond the traditional categorizations of IC. This included, following Brooking’s (2010) methodology, a discussion of the assets they would like to have that would help them more easily achieve their goals, i.e. “desirable” assets (p. 218).

After fleshing out these areas of IC assets specifically related to success for their church, participants were asked to reflect on the extent to which they had each asset, and the extent to which they had been able to leverage them to achieve their objectives. This provided insight into RQ3 about attempts to leverage IC.

Discussion of potential liabilities (RQ4) was found throughout.

3.3 Analysis

Transcripts of each FG were made immediately following, and coding of transcripts was done in Nvivo following the coding scheme of Corbin & Strauss (2008). To ensure that saturation was achieved inductively, all data was coded initially according to an open process that gave “all data equal consideration” (Morse, 1995, p. 147). This ensured that saturation did not occur prematurely but out of actual replication in the data. Axial and selective coding providing larger concepts and categories that could explain more and more of the data. Coding was informed by existing IC models, yet the data suggested nuances in this framework. Thus, the final categories do not represent all possible IC, but only IC of strategic value to the stated goals of the churches.

4. Results

The primary findings of the study include an overview of success defined by church leadership, a description of IC assets, an overview of leadership’s epistemology and approach to leveraging these assets, and a description of potential liabilities uncovered in analysis. Table 1 outlines the assets discovered in the three primary IC categories. It also shows the liabilities attached to each asset.

Table 1: IC Assets and Liabilities

<table>
<thead>
<tr>
<th>IC Category</th>
<th>As asset</th>
<th>As liability</th>
</tr>
</thead>
<tbody>
<tr>
<td>Human</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Emotional Loyalty</td>
<td>Increases commitment</td>
<td>Commitment based on a feeling can be frail</td>
</tr>
<tr>
<td>Optimism</td>
<td>Allows individuals to look beyond immediate success and failure</td>
<td>Is waning as a result of leadership-centric structure</td>
</tr>
<tr>
<td>Diversity</td>
<td>Allows them to be one body with different parts</td>
<td>Is leaking due to narrow demographics of relational partners</td>
</tr>
<tr>
<td>Honest Imperfection</td>
<td>Allows them to find the good in the struggle and keep moving</td>
<td>No noted liability</td>
</tr>
<tr>
<td>Relational</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Accountability</td>
<td>Keeps people working toward the mission without leadership pressure</td>
<td>Is limited, not transferring to taking responsibility in other areas</td>
</tr>
<tr>
<td>Partnerships</td>
<td>Provides social capital of financial resources and emotional support that may be asymmetrical</td>
<td>Is limited to people that look like them</td>
</tr>
</tbody>
</table>
IC Category | As asset | As liability
--- | --- | ---
Structural Communal Risk Culture | Builds love and provides opportunities for movement and innovation | Consumer-based culture is too reliant upon leadership to get things done, causing missed opportunities for value creation with each structural asset
Embodied Vision | Strengthens commitment to the vision and actually changes behavior | No noted liability
Learning | Provides opportunities for increased growth and commitment to mission | Biblical interpretations introduce boundaries and may keep information out

4.1 Success

Participants were consistent in discussion of success (RQ1). Success meant having an external impact, to be “more effective in outreach beyond our walls.” It meant being “a support and resource for our community.” It meant having “people on the outside who’d look at us and go, ‘you’re valuable to us’” They were passionate about this, calling it their “pride and joy.” One participant suggested, “if you needed to call a friend, they’d think of us [the church].” In order for this to happen, they needed to show themselves as just as susceptible to failure as those outside of the church. This helps remove the “barriers to admission” that leadership identified in people outside of the church.

Yet they also wanted to have an impact internally with those already in the church. This required that they be “compelling” and “invigorating.” Success included internal unity. One participant defined this success as “breaking down the walls of the cliques and groups so that we are one community and church instead of a divided congregation.” Above all else, the church wanted to be “a place directed by God.”

4.2 Human Assets

Participants pointed to several Human IC assets to help them achieve this success of external impact and internal unity. These included emotional loyalty, optimism, diversity, and an embracing of imperfection.

2.1.4 Emotional Loyalty

A loyal and committed attitude among congregants was essential to the church’s success: “I think it all comes back to commitment.” And this commitment came out of “our love for our church.” Participants agreed that this commitment rose out of an “emotional connection to everything that we do here in the church.” Music was central to this, as it “taps into your emotions.” One participant noted, “There’s some Sundays when that music is so powerful, I just want to get up and go home, because it’s everything.”

2.2.4 Optimism

A second important attitudinal asset was optimism. Participants embodied the “confidence” to “dream and hope.” Even in areas considered liabilities, participants agreed that “it’s getting better” because “as Christians, we believe we’ve been given gifts by the Holy Spirit, and I have confidence in that.” Participants referred to this optimism as “faith” which allowed congregants “to do and let the Spirit guide you.” In this way, the optimism was not tied to immediate successes; rather, it was tied to belief in future success: “We have this truth of God and what God’s given and shown us and told us he will do.”

2.3.4 Diversity

Participants valued the diverse knowledge and capabilities of each congregant: “We have a lot of people from different backgrounds.” As they looked for success both internally and externally, they wanted to highlight the “different points of view” and “variety of gifts” that congregants bring. This was especially important with occupational diversity, as there was “value in what each person’s own careers are.” This included skills in teaching, singing, architecture, finance, law, and medicine. Participants relied heavily on the theology of 1 Corinthians 12:12, that “just as a body, though one, has many parts, but all its many parts form one body, so it is with Christ” (NIV).

2.4.4 Honest Imperfection

Participants also valued imperfection, and agreed that everyone falters in carrying out the mission of church: “We always have steps back, but it’s fine as long as we’re still trying to move forward constantly into spiritual maturity so that we can utilize all that we’ve been given.” Participants valued this because it was genuine: “Living a life of honesty and showing others that we’re not perfect, but we’re trying to be better.” They often
described life as a struggle that “is not always going to be perfect.” And as congregants bring this imperfection into the church, “the struggling can make us stronger.”

4.3 Relational Assets

Participants noted internal and external relational elements of value to their success.

3.1.4 Internal

Relationships within the church were characterized as a “yearning and a desire to be with one another.” Relationships were defined by love: “Love, that’s what we’re good at.” There was a strong sense of “friendship and support for each other” that was important for internal success. Participants agreed that “there’s an extraordinary large amount of love with this group.” Their relationships were characterized by “intimacy, vulnerability, trust, and love.”

These intimate relationships resulted in actual social capital resources. One participant stated with confidence that “if something were to happen, I could go to a number of people without a doubt and they would give me the shirt off their back to help me.” One participant recalled that “when someone in our church family loses someone they love, we as a church get together and try to minister to them by providing a meal—something they wouldn’t have to worry about.” Another participant personally experienced losses from flooding and noted that the church “organized a group and that Saturday they all came over to my house and helped me rip up all the carpet that we had downstairs that was destroyed and help us get back to at least a point where we would be able to have some semblance of normalcy.” These resources were also intangible, as one participant—who lost her partner 2 years ago—indicated that “I would not be anywhere where I am right now if it hadn’t been for the ministry of everybody in this room and the church and the congregation.”

These intimate relationships also allowed for internal accountability, i.e. holding one another accountable for doing things that further the mission and objectives of the church. Participants were “building accountability” into relationships to ensure continuation of practices like prayer, Bible study, meditation, and fasting—all considered essential components of church success. Participants were not afraid to call one another to account: “Well, have you read your Bible? Have you ever been to a Bible study? What do you mean how do you know that?”

3.2.4 External

All churches viewed their relationships with external nonprofit organizations as extremely valuable. This included local food banks, LGBT support centers, Ronald McDonald house, addiction support groups, prison ministries, etc. This also included the building of relationships with those individuals they seek to serve as part of their external indicators of success: “Through the food pantry ministry we’ve built relationships with those who are in need of food assistance in the community.” Yet, the goal was not to own this market of needy people, but to figure out where they could meet needs and where others could meet needs.

Similar to internal relationships, these external partnerships resulted in actual social capital resources. This became apparent during difficult times, as churches held a unique place within the community: “A few years back a church burned down, and the whole greater Columbia area pitched in and helped them out to rebuild.” The UCC congregation had experienced flooding within the last 2 years, and noted that “we got a lot of support from the local community.”

These partnerships were particularly important with other churches: “I’ve been trying to keep us aligned with the other churches and talk with them and, you know, see if there’s any way that we can help each other back and forth.” Several participants noted value in their denominational affiliations: “The United Methodist Church is connected with all the United Methodist churches across the world. So, there is tremendous value to partner in and take resources.” Another participant noted that, if something were to happen to the church, “there are three other big denominations that are right here that we do have relationships with. I know for a fact they would come and help.” Thus, it was not assumed that these partnerships would be mutually beneficial, as times may call for asymmetrical assistance such that larger churches may shoulder the burden of smaller churches.
4.4 Structural Assets

Structural assets included a culture of communal experiences and risk, an embodied vision, and a culture of learning.

4.1.4 Communal Risk Culture

The churches valued the space for communal experiences. The things they did together—reading the Bible, meditating, fasting—"are those pieces of our communal experience that we share and that build us up regardless of what other physical assets we have." This communal space not only provided opportunities to "find people's spiritual gifts and put them to use," but it did so in a way that promoted risk-taking. They focused on "making space for people to take risks." These risks were promoted within a culture that provided support for both success and failure: "We can teach others how to encourage you rather than tear you down, that when you step out on that limb with that thing that you're nervous about, we can teach others to step up and support."

4.2.4 Embodied Vision

Participants showed a very strong vision that transcended the immediate success of the organization itself, yet helped them achieve that success. More than simply achieving inward and outward impact, the churches had a mandate from God that went beyond this: "Even more than just what we've said we'll do, it's what we've told God we'll do. This is what God has put before us is to do this." Another participant called them "little nudges from God . . . I'm supposed to act on that." Because of this, the vision stayed with them and impacted behavior outside of the church: "In my day-to-day life, because I'm involved in church, I'm more able to provide a Christian-like attitude that is honest, supporting, and fair." When discussing the success of the church, one participant noted, "To me it becomes something that I want to embody myself."

4.3.4 Learning

There was also a strong culture of learning that was part of the branding of each church: "I would think a good goal would be for someone to say, 'That's a church where you will learn what it means to follow Christ.'" Participants were aware of the need for learning and growth, especially with those new to the church: "Some of us don't know how to further that relationship [with God], and we need to teach them how to further that relationship." And this learning did not end at some stage of mastery: "We can all still learn about God, at all levels—youth and adults." This was often referred to as discipleship, and participants noted excitement in the church about this: "We had excitement about the classes; I felt like people really enjoyed the classes and learning." The content of this learning was closely aligned with their biblically based definitions of success: "One of the big focuses this year is to be intentional with more time to teach and provide the biblical values and learn the books of the Bible and learn the stories and the history."

Yet participants also noted value—especially as it related to their external success—in learning about the environment around them. Rather than merely focus on themselves, "we're a people who focus on a certain level of emergency status, stress—that healthy stress where we're focused on outside of us instead of our own deal." This was seen as necessary, because "the community changes, our surroundings change, so if we don't change with it, grow with it, we're gonna die." One participant noted, "Ideally we would be on the edge of chaos."

4.5 Leveraging Assets

Analysis of how churches attempted to leverage these assets (RQ3)—or turn intellectual assets into intangible assets (Caddy, 2000)—reveals one primary leveraging action for each of the three IC categories. This represents their view of the best ways to extract this value. It represents areas of intentionality: "I think intentionality is the key. Being intentional about what we're doing moving forward, recognizing this and being intentional."

5.1.4 Intentional Extraction

In order to leverage the human capital of the church, participants tried to engage in attempts to extract and find out what congregants offered: "What does that person bring? Is there something that we can pull out of that person that will make them want to come more often." This was done primarily by "providing an environment where we can tell our stories." Participants agreed that "the church has always been based on people sharing their experiences of God with one another." Important to the success of all churches was
increasing their awareness of these stories: “We can find those stories and share them in a way that people can see pieces of themselves in your story.” This was particularly helpful for increasing involvement of congregants: “What is that thing that they’re terrified of doing that you’ve just given them the freedom to do try because you said, ‘Yeah I was terrified when I started doing this, too?’

5.2.4 Intentional Interaction

In order to leverage the relational capital of the church, participants focused on increased socialization and richness of communication “to provide opportunities and events that are multi-generational to really get to know one another.” They focused on increasing face-to-face communication in small groups to leverage the love and accountability in these relationships: “The most meaningful relationships I’ve formed seem to come from small Bible study groups.” These smaller groups serve as a “bridge to know what people need in each service.” Yet these activities could not merely be advertised with an expectation of high turnout. Instead, they strived to intentionally “tell people that we want them there.”

5.3.4 Intentional Change

In order to leverage the communal structural capital, particularly of commitment to change and learning, participants focused on openness to the abandonment of existing structures and processes: “We have moved to a place where we’ve found new assets; we’re going to do something different.” This is aligned with renewed faith and “energy” to accept the changing environment: “Church as the 1950’s model is over. It’s waning. And there’s a new culture of church. We need to trust it will work.” Regarding those who have left the church, it was noted, “If we want them to come back, we have to be different, because they think they already know us.” This was also tied to a more intentional use of their vision, which assumed movement: “We use the mission as the rallying cry pulling us toward doing God’s will.”

4.6 Liabilities

As noted, however, IC cannot be viewed merely optimistically, assuming it will create the value it purports to create. There exist liabilities, which are here examined to answer what might lead to a failed realization of IC (RQ4). Human liabilities included emotion and internal awareness and diversity. Relational liabilities included accountability, and partnerships and diversity. Structural liabilities included a leadership-driven culture

6.1.4 Human

Although emotion was considered essential for increased commitment, emotions were also blamed for a lack of commitment. Participants noted that commitment was often frail due to small, emotional reactions: “If you all aren’t singing my favorite hymns I get upset with you.” Participants noted that this emotion hurt commitment when “people were maybe focused elsewhere.” This led to people often leaving the church for unknown reasons: “For various reasons people just stopped coming.” This primarily included emotional attachment to political views and personal preferences.

Participants noted the importance of knowing what skills and attitudes congregants offered, yet “we probably know about 20 percent of the people really well and the other 80 percent we don’t know very well at all.” Because they lacked this awareness of themselves, they failed to recognize where they could increase diversity in order to break down cliques—something noted as part of their success. They struggled with what it meant to be a “conglomerate that is not just your normal, clean, white male.” They wanted to have an attendance that was “reflective of the community,” yet each church had a mostly Caucasian attendance that did not match the diversity of their communities.

6.2.4 Relational

Although participants noted the value in internal accountability, they shifted blame when accounting for their lack of relevance in the community: “The world, the culture, the world we live in. Everything’s competing for our attention. The church has kinda become the spare time thing.” Although they recognized the need to change to reflect the community around them, they simultaneously blamed this community: “Today’s environment and today’s culture contributes something to our lost relevance as well.”

In the valuable partnerships noted by participants, they admitted that these partnerships are very narrowly chosen based on those groups who are like them: “I think our focus is on one population. We eliminate people when we do that.” They agreed that, “If we want to talk about people who are not like us, we could make a
very intentional move to the transient population in our community.” However, “We have not taken advantage of those to date.”

6.3.4 Structural

Participants noted the value of a communal culture that provides opportunities for co-creation. Yet, much of this co-creation is being missed, as too much falls on the leadership teams within the church: “It takes more than one person to have an idea in order for it to come to fruition, and I think we fall short in that area.” Often, the hierarchical structure of the church contributed to this. One participant noted wanting to repair broken lights in the church, but “there's the fear of, I can't do things because I'll get in trouble with that committee.” This lead a near complete lack of creation: “We are a maintenance church, I would say. There is a sense of just maintaining what we do.” This led to the optimism of leadership—something noted as a valuable asset for success—waning: “You burn out quick.” Participants agreed, “we’re all tired, and we all do a lot.” This led to decreased optimism about the ability to inspire co-creation within the larger congregation. This was often related to what they viewed as a “consumer culture.” In this culture, “people come and sit and expect to be fed and then leave and come back the next time and expect to be fed.”

5. Discussion

5.1 Traditional Classification

The aim of the current research was to first open up to questioning the traditional three-pronged classification of IC—human, relational, and structural. This was done by guiding participants in a discussion of intangible assets that did not prompt them to think in terms of these three areas. Yet, analysis of responses suggests that answers still fit into these three categories, thus validating the traditional models. This makes sense, given the abstract nature of these models (Kaufmann and Schneider, 2004). However, analysis showed important detail and subtopics within this broad classification that can be more practically applied in other contexts. For instance, asking organizations to look at the potential of better leveraging accountability to provide members with ownership of the mission is more direct and easier to implement than simply suggesting they leverage relationships.

Although fitting this general classification, the current study revealed that many assets were related outside of their asset classification. For instance, the structural vision asset that characterized how things are done around here was related to the human asset of commitment and loyalty. The relational asset of love and social capital was possible because of the human asset of honesty about imperfections that broke down the façade of perfection. The structural asset of risk-taking was possible because of relational support for both success and failure. This is significant because it shows that efforts to prioritize certain elements of IC may inadvertently impact others. Researchers and practitioners must be aware of these connections before deciding to focus on one asset at the expense of another.

5.2 Context

As part of this aim to open the model up, context became a crucial component. Analysis showed that, although they still valued the traditional classifications of IC, the subtypes of IC valued by the churches differed significantly from those valued by other contexts. Table 2 summarizes key assets according to their general type and context. Several important conclusions can be drawn from this analysis. First, assets in other contexts tend to focus on ownership, e.g. patents are owned, market shares are owned. Any collaborative effort is done with assumptions that they will be mutually beneficial. In contrast, the churches viewed other organization’s ability to meet a need as an asset. This is because they cared more about the need itself than who would provide the solution to that need. The relational assets the churches prioritized included a shared stewardship of a need, letting other organizations take over when they could better meet a need. Second, assets in other contexts tend to focus on showing and highlighting what people know, either through formal educational achievement or evidence of integration of processes. In contrast, the churches viewed the admission of imperfection and lack of knowledge as itself an asset. Finally, assets in other contexts tend to focus on codification, either for technological automation or tangible product offerings. In contrast, the churches valued a maintaining of the messiness and tacit nature of a culture driven by God. The focus was not on codifying this, but continuing to explore it.

A central question raised from the current research is how these other organizations might benefit from these insights as they consider the IC assets they prioritize. Clearly, the profit-driven nature of non-church contexts
influences many of their priorities. Yet, the researcher is neither convinced that profit necessitates such priorities, nor that these church assets are not already present and potentially beneficial in other contexts. The human assets of loyalty, optimism, and honesty are not church-specific. They are simply deeper levels to traditional attitude assets, and churches provide case studies for how this can be developed. Many organizations would be interested in identifying how the relational capital of trust and collaboration are evidenced in actual capital resources.

Table 2: Differences in Key Assets by Type and Context

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<tbody>
<tr>
<td>Example of Key Relational/Market Asset</td>
<td>Admission of imperfection</td>
<td>Knowledge of standardized techniques and processes</td>
<td>Formal education</td>
<td>Creativity for innovation</td>
<td>Formal education</td>
<td>Not mentioned on balance sheet</td>
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<tr>
<td>Example of Key Structural Asset</td>
<td>Asymmetrically beneficial partnerships with community groups</td>
<td>Mutually beneficial relationships with outsourcers</td>
<td>Coordination of services with local providers</td>
<td>Frequent customer interaction</td>
<td>Market share</td>
<td>Occasional mention of customer relationships</td>
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Future research should consider, for instance, the feasibility and potential benefit of a profit-driven organization that prioritizes customer satisfaction in such a way that it is willing to give up market share to other organizations better suited to fill a need. Rather than chasing down potential customers that will not be completely satisfied, would they not be better off focusing on those customers whose needs truly do fit what the organization offers? In addition, what would happen if an organization valued—rather than attempted to cover up—its imperfections? This could help them better leverage assets, as organizational members are encouraged to highlight deficiencies. It could also create a culture of risk-taking that spurs innovation, as members are not afraid of failure. Finally, organizations could benefit from a decreased focus on codification. Given the complexity of any organizational system, most of the richest parts of it occur in domains of complexity (Snowden, 2002). Forcing simplicity through codification can put the organization on the verge of chaos.

5.3 Liabilities

Another important element discovered in the current study is that assets can easily become liabilities if not properly managed. This continues much needed research into IC liabilities (De Santis & Guiliani, 2013), and validates the claim that intangible assets can also explain problems in an organization (Garcia-Parra et al., 2009). It reaffirms management’s need to monitor for possible negative effects from IC (Dumay, 2013). Commitment, for instance, was an asset; yet, not properly managed and maintained, it easily becomes a liability, as the same behavior type causes lack of participation. Liabilities concern the possibilities that existing IC could disintegrate or deteriorate into something harmful (Harvey and Lusch, 1999). Organizations would do well to take a closer look at their assets and brainstorm the possible ways they could end up hurting them if not properly maintained.

5.4 Leveraging

The current research also considered the ways in which the churches attempted to leverage assets. Analysis suggests that this leveraging follows closely with Stacey’s (1996) control parameters for complex adaptive systems, which suggests that “the pattern of behavior of a particular system as a whole changes as its control parameters are altered” (p. 54). They include information flow, diversity, and richness of connection. This has practical implications for organizations wanting to better leverage and develop their assets to achieve their mission. The leveraging of human capital required an increase of information flow through the creation of an environment that supported storytelling. The leveraging of relational capital required an increase in the
richness of connection, as more opportunities were provided for face-to-face interaction in small groups. The leveraging of structural capital required an increase in diversity, as the need to change and abandon existing models was realized only through the inclusion of more and more diverse individuals.

6. Conclusion

This study sought to validate the traditional classifications of IC, as well as introduce contextual elements that add to what is known about IC. The results of this study have several implications for practice and future research. It reinforces the importance of strategy and mission when discussing the prioritization of IC. It also uncovered unique elements of IC that, although they may be unique to churches, could possibly be of value to other contexts. The goal here is to increase such research so that cross-pollination among contexts occurs with newly discovered assets, such that organizations realize valuable assets they may have but have not leveraged. Further nuances in IC liabilities were discovered, and the ways in which IC can be leveraged was shown to follow a pattern similar to the guiding of any social system.

This study’s significance comes from its uncovering of subtle nuance in the human, structural, and relational assets churches considered valuable to achieving success. These assets included a loyalty and optimism that went beyond immediate reward or success, but was tied to a larger vision. This vision was inseparable from the personal wants and desires of each organizational member and extended to life outside the organization. These assets included a focus on deep relationships marked by love, and resulting in actual social capital resources of labor assistance to rebuild flooded homes and the cooking of meals after personal loss. These assets included a space for supported risk-taking in an environment constantly learning about its external environment.

This study also has several significant methodological implications. Involving leadership in an inductive conversation about IC assets is important to success as they define it. This also provides a managerial view of IC related to strategy. By not asking participants directly about human, relational, and structural assets, the provided data reveals an unprompted and richer outline of intangible knowledge resources. Yet, this method does not assume that stated assets are fully recognized, thus providing important data about liabilities in IC. These liabilities provide a larger and more accurate picture of IC within an organization by identifying missed opportunities and leaks. More research is needed into these liabilities in other organizations, shifting away from an optimistic-only view of IC. Particularly significant is the realization that focusing on certain aspects of an asset can actually create liabilities in the same asset. This method also extracts important epistemological assumptions about knowledge assets that impact how organizations approach efforts to leverage the value of these assets.

Future research should look at the extent to which these assets actually are transferable to non-religious organizations. Research is also suggested into other organizations that provide similar deep dives into unique areas of IC. This inductive approach could add completely new categories and understanding to the IC concept.

References


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Constructing Accountability for Intellectual Capital in Accountability Settings: Coupling Of Spaces And Logics

Victoria Konovalenko Slettli¹, Anatoli Bourmistrov² and Kjell Grønhaug³
¹School of Business and Social Sciences, Inland Norway University of Applied Sciences, Norway
²Nord University Business School, Norway
³Norwegian School of Economics, Norway
victoria.slettli@inn.no
anatoli.bourmistrov@nord.no
kjell.gronhaug@nhh.no

Abstract: Several challenges face the notion of accountability in the context of non-profit organizations. Included among these are multiple principle stakeholders with different objectives, interests, and level of influence, as well as output that is intangible or difficult to measure. In order to align stakeholders’ contradictory interests, for-profit organizations employ market mechanisms. The non-profit sector, however, lacks this type of regulation. It is suggested that governing bodies should adopt the responsibility of aligning various interests with the mission of the non-profit organization. This paper addresses the issue of accountability for intellectual capital in the context of a non-profit organization using the case of Severstal Corporate University. It approaches accountability by examining accountability practices that are socially constructed in their settings in terms of accountability relationships, the content of accounts, and justification mechanisms. The study suggests that accountability is constructed through the interaction of two subjects: ‘spaces’ and ‘logics’. The study contributes to the research on accountability for IC in non-profits by demonstrating how the mechanisms of customer feedback, reputation and ‘corporate rumors’ can be used in the alignment function of the governing bodies. Furthermore, the study contributes to the field of IC by suggesting a new framework/guidance for the organizations that do not use IC reporting but nonetheless want to provide stakeholders with IC information.

Keywords: accountability, intellectual capital, spaces, logics, settings, corporate university

1. Introduction

This paper addresses the issue of accountability for intellectual capital (IC) in the context of a non-profit organization known as a “corporate university”. Accountability in nonprofits serves as a powerful tool to demonstrate that stakeholders’ interests and expectations are addressed properly (Hyndman and McConville 2017). Furthermore, accountability is important in reducing the information asymmetry that can hinder the building of trust. The notion of accountability, however, is subject to increasing complexity. A broad range of stakeholders with various interests in and demands on organizational accounts complicate and challenge the process of accountability due to competition between and possible collision of accountability interests (Boesso and Kumar 2009).

In the context of non-profit organizations, accountability is challenged by multiple principal stakeholders with different objectives, conflicting interests and various degrees of power to enforce their interests (Ebrahim et al. 2014). Scholars highlight the divergence of interests and tensions among the accountability demands of the powerful stakeholders, such as donors (‘upward accountability’), and beneficiaries, who usually have little voice but constitute the purpose of the organization (‘downward accountability’) (O’Dwyer and Unerman 2008). The challenge lies in aligning and prioritizing the interests of various stakeholders, especially when these interests conflict. From this point of view, the role of principles and governing bodies is a political strategic one—to align interests around the purpose. In (for-profit) business organizations, this alignment is facilitated by the market exchange mechanism, a mechanism the non-profit sector lacks. It is mainly the function of governance to address the interests of beneficiaries and to align their interests and the interests of the principal stakeholders with the mission of the organization (Ebrahim et al. 2014). To strengthen the role of beneficiaries in accountability relationships, their bottom-up feedback can be shared with both the organization and its funders (Twersky et al. 2013).

Furthermore, the non-profit context is characterized by multiple goals and ‘intangible or difficult-to- measure outputs’ (ter Bogt and Tillema 2016). Scholars have addressed the problem of measuring and managing intangibles in the last two-and-a-half decades. As a result, a large number of various frameworks and models

of IC reporting have been proposed to serve the purposes of both offering accountability to external parties and providing internal information for managerial decision-making (e.g. Petty and Guthrie 2000; Alcaniz et al. 2011; Guthrie et al. 2012). The original optimism of the IC reporting rhetoric has been tempered by the recent studies of the de facto use of IC reporting by companies (Dumay and Garanina 2013; Nielsen et al. 2017). Recently, in response to Edvinsson’s (2013) comment about the ‘need to go beyond IC reporting’ (p. 163), several alternatives to IC reporting have been suggested—among which are integrated reporting (Dumay et al. 2016) and IC disclosure (Zéghal and Maaloul 2011; Schaper et al. 2017). The interim findings suggest that different kinds of IC information might be reported within the different reporting frameworks, such as integrated reporting, financial statements, or a Global Reporting Initiative, of which IC forms an essential part (de Villiers and Sharma 2017). The field of IC appears to be at a crossroads.

The above overview suggests that a) accountability in the non-profit sector is a contested concept due to the diversion of interests between funders and beneficiaries and the absence of the alignment mechanisms of the for-profit sector; b) the reporting/disclosure of IC is at a crossroads due to the non-use of IC reporting and the random representation of IC in different disclosure frameworks; and c) whereas the research literature has addressed the issue of accountability in non-profits in general, very little is known about accountability for IC within this type of context. Therefore, we adopt an accountability approach towards IC and pose the following research question: how is accountability for IC constructed in the context of a non-profit organization?

IC is usually understood as a set of intangible assets that play an important role in value-creation but are not displayed on the balance sheet like physical assets; it comprises the totality of employees’ knowledge, skills and competences that create wealth for a company (Nadeem et al. 2017). Accountability is a broader term that embraces both reporting and disclosure (e.g. van den Burg and Mol 2008). It refers to the process of giving and receiving an account and exists in relation to social and political conditions on which this process is based (Alawattage et al. 2014). Accountability embraces both the ‘text and context’ of accounts: what is being accounted for and how, together with the rationales for choosing methods, narratives, social practices, and rituals though which such exchanges are performed (ibid., p. 402).

This question of interest is approached by studying accountability in the context of Severstal Corporate University. We suggest that accountability stretches beyond formal hierarchies of actors and formal lines of accountability towards accountability practices in their settings in terms of actors, content, and justification mechanisms. The paper examines accountability in four particular settings and demonstrates that, beyond hierarchical relations, accountability is constructed in three spaces and by use of three types of logic.

The paper proceeds as follows. The following section elaborates on the notion of accountability and the conceptual framework of the accountability setting. Furthermore, we address the research method for the study and present the case organization—Severstal Corporate University (SCU). The following section renders descriptions of four accountability settings in SCU. The next section discusses the findings in terms of accountability spaces and logics. Finally, we close by highlighting how this paper contributes to research on accountability, IC, and, more broadly, the non-profit sector, and outlining suggestions for future research.

2. Conceptual framework: Accountability as constructed in accountability settings

Accountability is contextual (Roberts and Scapens, 1985; Miller, 1994), for no one can imagine providing accountability in a social vacuum (Tetlock, 1983). In order to understand accountability within an organization it is important to understand how accountability is socially constructed. As argued by Sinclair (1995), accountability is ‘subjective’ and ‘continually being constructed’, and it ‘changes with context’ (pp.219, 231).

Like other practices, accountability can be considered in terms of settings (Tetlock, 1983). According to Tetlock (1983), people function and work ‘in settings in which implicit or explicit norms of accountability and responsibility regulate and manipulate the conduct of the participants’ (p. 74). Given this reasoning, we can assume that accountability settings can be understood as peculiar combinations of specific places, human actors, objectives, events, timeframes, accounts, etc. Such settings would inherently convey specific meanings. As mentioned above, they are linked with certain norms and practices, and hence with ideas, values, attitudes, and rituals, which can be ‘painted’ by language. The previous works of, among others, Hopwood (1983), Roberts and Scapens (1985), Miller (1994), Gray et al. (1996), Kirk and Mouritsen (1996), and Ezzamel et al. (2007), suggest three specific categories that characterize accountability settings from three particular
dimensions: communication relationship (i.e. actors involved), content of accounts, and mechanisms for their justification.

Accountability setting implies certain actors and relationships—that is: who owes accountability to whom (Hopwood, 1983), and who is to benefit from its value creation (Ebrahim et al., 2014). Romzek and Ingraham (2000) distinguish among four types of accountability relationships, based on their own structure, applications, degree of autonomy, and sources of control. The accountability relationships are as follows: a) hierarchical (based on position/rank); b) legal (based on legal standards and regulations, and the prescription of the law); c) professional (based on expertise and experience); and d) political (based on the demands and needs of the stakeholders). It is suggested that for the purposes of organizational efficiency and resilience, organizations should avoid rigid borders of the accountability relationships, thereby allowing for more fluidity of the lines within these relationships (McCall and Pruchnicki, 2017).

According to Dubnick (1998), accountability does not simply concern the reporting, justification, and accounting of past events; it is also forward-looking in duty, commitment, and sense of loyalty. Hence, accountability can be both retrospective (accounting for something in the past) and prospective (accounting for future actions) (McCall and Pruchnicki, 2017). Both retrospective and prospective accountability can be found in all types of accountability relationships.

The very basic idea behind accountability is to show that institutions and people are functioning ‘properly’, ‘legitimately’, and ‘efficiently’, and therefore accountability relates to certain content and certain technologies that justify this content and the actions taken. Organizations and their people are aware of the fact that how they behave, operate, and serve customers will be revealed in their accountability, and hence they perform activities in a manner that would let them demonstrate ‘proper’ accountability. Thus, accountability concerns the value that an organization seeks to create—or in other words, ‘for what’ it is accountable (Ebrahim et al., 2014). Therefore, setting accountability involves a discourse with certain content (or disclosure) and repair mechanisms, which include explanations, justifications, and excuses (Kirk and Mouritsen, 1996). Accountability is a process that takes place in daily reporting about the reasons for certain conduct (Roberts and Scapens, 1985). It is an obligation to provide a formal or informal account, and an explanation of those actions for which one is held responsible (Gray et al., 1996) that is linked to certain content, measures, and dimensions. In this process certain mechanisms provide an articulation of accounts and thus facilitate the justification itself. Assuming that justification is a broader concept, the remainder of the paper will employing this term minimally, while remembering that accounting performance may be mobilized just as easily via explanations and excuses. Accountability can be also understood from the point of view of technology or technical representation (Miller, 1994), as the production of accountability demands both narration and calculation (Boland and Schultze, 1996). On the other hand, calculation techniques (for example, budgets and accounts) can be viewed as a common, basic element of traditional accountability, the narrative mode (rhetoric and success or failure stories) can be regarded as its important complementary element that adds meaning to the numbers. Figures in the accounts and budgets don’t speak for themselves—they need explanation and interpretation. Therefore, accountability for actions is expressed through story-telling and explanations. Narratives pinpoint urgent and significant matters within the company, accentuate its peculiarities, and hence assist us in better understanding the essence of organizational life (ibid.). They emphasize problematic issues and reveal those vulnerable aspects of a company’s operation that may need focused attention from management and timely interference and correction. Therefore, the narrative mode makes human experience meaningful and significant and becomes an ‘engine for the social construction of organizations and accountability itself’ (ibid., p.63).

Munro and Mouritsen (1996) suggested that the concept of accountability should be understood in a broader way: as extending itself beyond simply formal reports and accounts. It should also embrace the concepts of how individuals give accounts of and for their daily practices and through this produce and reproduce their individual and collective identities. Boland and Schultze (1996), referring to Bruner (1986), argue that accountability is constructed through the interaction of the paradigmatic and narrative modes of human cognition, which in their turn give birth to computational and story-telling forms of accountability. In the narrations, people select concrete events from their experiences, and tell stories that narrate about actors and events in a meaningful sequence. Such narratives of experience ‘make sense of ourselves and the world we live in’ (ibid., p.67).
In order to understand accountability for IC, we must focus on the following matters. First, what kind of accountability settings can we identify? Second, in these settings, what are the relationships (and the actors involved), the content of accounts, and the justification mechanisms employed? And third, what are the similarities between the settings?

3. Research method

3.1 Research context: Severstal Corporate University

To provide a comprehensive description and explanation of the phenomenon being studied (that is, ‘how accountability for IC is constructed in the non-profit organization’), a case study approach has been adopted (Ghauri and Grønhaug, 2002). Referring to Yin’s (2009) arguments for a case study, this particular approach is beneficial, because: a) the research question is of an exploratory nature; b) the researchers’ control over the studied events and phenomenon was minor; c) the focus of research was the ‘accountability for IC’ within the real-life context of a corporate professional training centre called ‘Severstal Corporate University (SCU)’; and d) an in-depth understanding of the research problem can be gained.

The reason for choosing SCU as the site of research is connected to the very purpose and operation of this organization—dealing with organizational IC in the non-profit sphere. SCU was established as a centre for education, information, methodology, and consulting for business units within the Severstal Group, an international, vertically-integrated metals and mining company headquartered in Russia. SCU identifies its four main functions as: knowledge management, consulting, research, and training and HR development. Knowledge management takes place through the development and accumulation of knowledge assets, dissemination of 'best practices', and promotion of a knowledge-sharing culture by means of a common business language, knowledge databases, information storage, group discussions, training, and a system of seminars and conferences. A consultancy tool was created to develop a common business culture and integrate and spread the ‘best practices’ among the business units across Severstal. SCU carried out several types of sociological research (corporate, regional socio-political, marketing, media-research, and business analytics) through surveying and ‘scanning’ the external and internal environment. Training and educational activities, in the form of various courses and programs (both long and short-term, e-based and on campus), aimed to develop managers’ leadership skills, employees’ administrative and technical competencies, and the key competencies of the business units in identifying and retaining talents in all areas of activity.

SCU’s projects and programs were implemented on campus or via e-learning systems employing both the intranet and internet. SCU’s IT system provided access to the corporate information resources to the enterprises of the Severstal Group both in Russia and overseas.

SCU employed a pool of experts and managers with work experience from the Severstal Group. At the moment of data collection, the full-time staff consisted of about 80 people, most of whom possessed a scientific postgraduate degree, an MBA degree, or two higher degrees. SCU was located in the Russian city of Cherepovets and the number of enterprises using SCU’s services was more than 50.

3.2 Data collection

A methodological approach in this study combined primary and secondary data sources. Empirical data was gathered through qualitative interviews of both individuals and groups (see Appendix 1), participation in two work meetings, company records, mass media publications, websites, and other publicly available data. The bulk of the interview data was gathered at two stages: March 2007 and March 2008. In total, 12 interviews (both group and individual) lasting between 0.5 and 1.5 hours were undertaken. These were recorded and/or followed with written notes. Ten people participated in the interviews, and four were interviewed twice.

The data was analysed as follows. First, several specific groups of particular importance in terms of accountability were found to exist in the Severstal setting. Second, these groups were engaged in several types of accountability relationships, each with different characteristics, such as: strategic vs operational, continuous vs periodical, ad hoc vs planned, formal vs informal, etc. The content of accounts and justification tools employed in SCU’s accountability to each group varied. Therefore, these variations allowed for distinction among those four specific accountability settings, which in the following section are described and analysed from the point of view of their inherent features: method of communication, account content, and mechanisms for their justification.
4. Accountability settings in SCU

The study revealed that the nature of accountability relations in the context of SCU was rather complex and ambiguous. SCU was involved in accountability relationships in four particular accountability settings, each of them described by a number of specific characteristics: accountability relationships (those to whom accountability was provided), the focus of ‘accounts’ given by SCU and the main interest in accountability, and, finally, justification mechanisms that ‘backed up’ the ‘accounts’ given. The summary of the four accountability settings is presented in Table 1.

Table 1: A summary of accountability settings in the SCU context.

<table>
<thead>
<tr>
<th>Accountability settings dimensions</th>
<th>Setting 1</th>
<th>Setting 2</th>
<th>Setting 3</th>
<th>Setting 4</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Relationships: accountability authority</td>
<td>Supervisory Board</td>
<td>Corporate Centre</td>
<td>Severstal Business Units</td>
<td>Severstal employees</td>
</tr>
<tr>
<td>2. Major interest in accountability</td>
<td>Accountability for ‘substantial achievements’</td>
<td>Accountability for the ‘central order’</td>
<td>Accountability for the services to the ‘pseudo-market’</td>
<td>Accountability to human resources</td>
</tr>
<tr>
<td>3. Focus of ‘accounts’</td>
<td>• Keeping the budget&lt;br&gt;• Customer satisfaction&lt;br&gt;• Knowledge enhancement through corporate training programs&lt;br&gt;• Innovations/ new projects</td>
<td>• Costs&lt;br&gt;• Customer satisfaction&lt;br&gt;• Program content&lt;br&gt;• Attainment of preset goals in R&amp;D and HR initiatives</td>
<td>• Costs&lt;br&gt;• Customer expectations&lt;br&gt;• Quality of service&lt;br&gt;• Task specification&lt;br&gt;• Knowledge enhancement through ‘tailor-made’ training programmes</td>
<td>• Quality of service&lt;br&gt;• Personal satisfaction with training programmes&lt;br&gt;• Results/ consequences of training and research projects for people/business&lt;br&gt;• Survey indices: financial/non-financial indicators</td>
</tr>
<tr>
<td>4. Justification mechanisms</td>
<td>• Formal reports&lt;br&gt;• Narratives and success stories</td>
<td>• Benchmarking&lt;br&gt;• Feedback results</td>
<td>• Reputation&lt;br&gt;• Approval&lt;br&gt;‘Corporate rumors/gossip’</td>
<td>• ‘Persuasion’&lt;br&gt;• Corporate publications</td>
</tr>
</tbody>
</table>

Setting 1. Accountability for strategic governance

Accountability relations in this first setting involved SCU and its Supervisory Board. The Supervisory Board—which numbered 10 members—was recognized as superior executive body for SCU, whose main functions included approving SCU’s budget and its major activities and projects, and auditing the final report. The Board set strategic objectives and therefore demanded more general, substantial, and strategically meaningful accountability from SCU. During the annual meetings SCU management reported to the Supervisory Board about SCU’s performance for the previous year and obtained directives for future development. The SCU director noted that the Supervisory Board was rather interested in SCU’s more ‘substantial achievements’, meaning that it took more interest in strategically meaningful and broad issues rather then the achievement of specific sub-goals. Thus the annual reporting to the Supervisory Board represented SCU’s accountability ‘at strategic level’ and covered four basic areas: keeping the budget, customer satisfaction, implementation of the innovative projects (those annual new initiatives at SCU) and implementation. These accounts were presented in the forms of formal reports and narratives, or success stories.

The report presented to the Supervisory Board on SCU’s performance in 2007 was also published in The Synergy (iss. Feb. 2008), a corporate magazine of the Severstal Group issued by SCU. This summary provides some non-financial data about SCU’s operations. Basic reporting items include the types of training programmes, HR development activities, e-learning, research and consulting projects carried out, the number of programmes, the number of people involved in them, their timing, etc. The fact that the SCU report was presented in the corporate edition (which also has an on-line version available for all Severstal employees) reveals that SCU provided accountability by disclosing information not only to its main governing/supervising body, but also to a broader range of people employed by the Severstal Group.
Within SCU, knowledge was seen as located in the ‘best practices in functional areas, and best ways of the team work organization and problem solving’ (Corporate Standard on Knowledge Management, p.1); because of this, formal reports contained references to the ‘best practices’. Thus, managers employed a particular accountability tool: narratives in the form of success stories, which revealed how knowledge management efforts were explained and justified.

As the head of the Centre for E-learning explained:

*The third generation [of e-learning] in our understanding is something made with our own hands, inside the company. These best practices, which we dreamt of . . . but who will formalize them, who will describe best technologies? Do we need experts from outside? . . . So it turned out that there are people in the company who can do this. As a rule these are young people. . . .*

*Within the company we announced a contest for the best self-made e-course. And we were slightly shocked when we received several works visualizing industrial processes and machine operation which were made by the technical workers at their workplaces—by people who were really working with those devices. And this was great.*

This small anecdote provided by the manager illustrates how knowledge, which according to a corporate belief is located in the ‘best practices’, can be accounted for. An account of this type can hardly be placed in the formal report, but it represents an important element of ‘accountability for knowledge’. It also suggests that knowledge management stimulates knowledge development and learning via such different and seemingly contradictory tools, as competition and collaboration.

**Setting 2. Accountability for the coordination of corporate orders**

In the second setting, communication took place between SCU and the group of top managers representing the corporate centre of the parent company, JSC Severstal. Here accountability was more deep, detailed, and operational, and contained accounts for the orders placed by the corporate centre. The focus of accounts was quite broad, from costs and customer satisfaction to the programme content, corporate research, and various HR initiatives. Among the justification mechanisms, benchmarking and client feedback results were widely employed.

The corporate centre placed common central orders at SCU, ordering certain training programmes and providing funding for their elaboration and implementation. This was known as a ‘corporate order’, and was meant for the benefit of and consumption by all divisions of the Severstal Group. These corporate programmes and orders were intended to satisfy common needs of the corporation: for example, in spreading common corporate culture or unified knowledge in certain areas among all business units. In this setting, the top managers were concerned with expenditures, such as per capita cost, content of the training programmes, quality of service, and attainment of the specific goals. To support their accounts, SCU management used tools like benchmarking to justify the price and customer feedback to justify their accounts of the quality of service and customer satisfaction.

The SCU director explained what type of accounts the corporate centre expected to receive:

*Company management evaluates the work of SCU based on two major criteria: attainment of the preset goals and positive feedback from our clients, who are saying: ‘Yes, we worked with SCU, we are happy with them and want to continue our collaboration’. . . . During our discussion with the company CEO I had a folder with the feedback questionnaires to show what grades SCU’s efforts were given.*

The SCU director also identified other types of accounts provided to the CEO of the company, among which were: spread of the corporate culture, research and development activities, ‘talent management’ initiatives, elaboration and implementation of new training programmes, support of HR processes, and even change to the SCU concept and model.

**Setting 3. Accountability for the subsidiaries’ orders**

In the third setting, accountability connected SCU with Severstal’s enterprises. Each business unit within Severstal could request a service from SCU, be it a training programme, research, or consultation. SCU had no
external customers, so the issue of being competitive and outstanding was a relevant issue for SCU: it was a matter of supporting a ‘reputation’ in the eyes of numerous Severstal Group enterprises. ‘Reputation’ represents a general public opinion attached to a certain entity or object based on its previous achievements and performance, and is therefore linked to accountability. Reputation, or identity image, to a high degree affects expectations. SCU’s reputation for being a client-oriented organization created high expectations from its customers, which were to be satisfied in ‘the best way possible’.

In this setting, particular importance was attached to several types of accounts. For example, management of customer expectations was seen as an essential part of the service process, and SCU’s reputation was an important justification for SCU’s work to its corporate clients. A precise task specification was a form of ‘pre-accountability’ before the service was actually provided, and approval of this specification by the client was a justifying mechanism in the post-service account. The quality of the service provided was also a crucial element of accountability, which in addition to a formal evaluation of SCU’s efforts was in some sense ‘reported’ and conveyed among Severstal subsidiaries through corporate ‘rumours’. The cost of the training programmes was also an important aspect of accountability for the business units.

To justify accounting performance, tools like reference to SCU’s reputation, general approval of its activity, and ‘corporate rumours’ were employed.

Accountability relations between SCU and its clients took place in the form not only of SCU’s reporting on the results of the programme or training provided, but also of feedback provided by the head of the business unit, which showed the level of his satisfaction with the service received. As argued by the SCU director, this accountability tool had two sides, formal and informal:

*Formal indicators* – *is the feedback which we get after each project. From one side it is the feedback from the students and participants of the training programs and consulting projects. From another side it is the feedback from the client. Each time we analyze this feedback, and this forms the basis for judging about the quality [of the service].*

*Informal side* – *for me it is a wish of the client to continue collaboration with us. If a client who collaborated with us – comes to us again – for me it is the main indicator that he is satisfied with the quality and other parameters of our cooperation. If he doesn’t come back – for me it is a big hint that something was wrong. . . .*

The feedback principal embracing all SCU activities, including social and corporate research and use of the systems of distant e-learning or corporate knowledge and databases, played a double role: it was an account both to the Severstal business units and Severstal’s top management (corporate centre), and also served as an important basis for performance evaluation, both on personal and corporate levels.

**Setting 4. Accountability to the employees**

The fourth setting embraced accountability to the Severstal employees, both as groups and as individuals, who were seen as a valuable resource of knowledge for the corporation. Severstal employees who received their ‘part of accounts’ were working in Severstal enterprises at different levels of hierarchy, empowerment, age, specialization, and educational background. The employees received training through the SCU development programmes. They also participated in the corporate research and survey projects as interviewees and in consulting projects as trainees. In fact, SCU was not formally required to provide accountability to the trainees and project participants, for they neither ordered nor paid for participation in training or projects. SCU voluntarily provided certain accounts to these groups, however, via the corporate website and publications. As it was founded on a belief system, here accountability was interactive in character. In this setting accounts focused on the quality of the service received by the final consumers, their personal satisfaction, and those practical consequences that resulted from the implemented projects and training programmes. As a part of accountability to Severstal employees, SCU revealed the results of the surveys it conducted. Some of these ‘accounts’, for example, concerned the issues of wages, their structure, dynamics and indexation, the general financial and social situation of employees, their housing needs, their solvency, the number of contests with financial rewards and the employees involved in them, the innovation activity of employees in connection with their labour effectiveness, and other various business indicators (see Odinaeva, 2006). These accounts were
not required or demanded, but rather served as a bridge for building relationships with an important group of stakeholders on whom SCU was dependent: the company’s employees.

Persuasion was also used as an approach in relation to those Severstal managers who could withhold the reporting of ‘unattractive’ results at their enterprises to top management. Such behaviour could be beneficial for the managers’ reputations but harmful for the enterprise experiencing problems. Therefore, accounts of the research projects were often followed by a ‘psychological’ or ‘persuasive’ component. Furthermore, accounts employed in communication with employees were justified through the stories told in the corporate publications (e.g. SCU’s corporate magazine, website, and brochures, and the plants bulletins circulated narrowly).

The study reveals the existence of different accountability settings that can be identified from the point of view of relations and communication, and which are inherently linked to the specific content of accounts and mechanisms for their justification. It illustrates that, on a practical level, accountability setting can be understood in these three dimensions. The four stories of accountability seem to be quite different. But is it really so? The next section will address the question of what these various settings have in common, and how they can be understood and conceptualized on a theoretical basis.

5. Discussion: Accountability spaces and logics

This section aims to provide understanding of what accountability occurred across different settings and to highlight the settings’ similarities. First, three accountability spaces were present in every setting that signified a particular kind of accounting. Second, three types of logic served as the reasoning behind the accounts mobilizing techniques. In the present case study, certain spaces were found to be linked with certain logics.

5.1 Three spaces of accountability

The reflection about spaces of accountability can be considered as a follow-up of Kirk and Mouritsen’s (1996) study in which they discuss ‘space for accounting’. This space is constructed through the production of calculation practices and mobilization of the accountability and control systems to explain and justify economic behaviour and its results. It is seen as ‘both the medium for and outcome of accountability’ (ibid., p.256). It also serves as an intermediary, supplying reporting information from subordinates to superiors or colleagues, and situates explanations regarding general or personal performance, which this study illustrates. Exploration of the ‘focus of accounts’ in Table 1 reveals commonalities for all communication group types of accounts. That is, the content of accounts given by SCU managers can be grouped primarily around the following three ‘themes’: a) financial issues (costs, budgets, wages); b) quality of service and customer satisfaction; and c) knowledge-related activity. These groupings can be conceptualized as ‘accountability spaces’ within which SCU’s accountability took place—in particular, the financial, service, and knowledge spaces.

Table 2 presents a view of SCU accountability settings within the dimensions of these spaces. Each accountability space refers to all four accountability groups and embraces a particular content of the accounts.

Table 2: Spaces of accountability in SCU accountability settings

<table>
<thead>
<tr>
<th>ACCOUNTABILITY SPACES IN THE CU SETTING</th>
<th>FINANCIAL</th>
<th>SERVICE</th>
<th>KNOWLEDGE</th>
</tr>
</thead>
<tbody>
<tr>
<td>CONTENT</td>
<td>Budget frames</td>
<td>Customer expectations, satisfaction, and loyalty</td>
<td>Implementation of corporate orders and projects</td>
</tr>
<tr>
<td></td>
<td>Cost per capita</td>
<td>Number of repeat orders</td>
<td>Innovations</td>
</tr>
<tr>
<td></td>
<td>Wages</td>
<td>Quality of service</td>
<td>Number of repeat orders</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Meeting of deadlines</td>
<td>Best practices</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Knowledge codified in databases</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Expert knowledge</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Learning</td>
</tr>
</tbody>
</table>

The space of accountability for finance refers to financial or economic issues and indicators. In accountability to the ‘clients’ who ordered SCU services, the measurement focus was placed primarily on such indices as cost per capita within a certain training project and implementation of service within budget frames. Financial accountability to Severstal employees emphasized their financial situation. The data SCU obtained through its corporate surveys and studies reflected, for example, the dynamics of wages at the enterprise, simultaneously
referring to and accounting for the actions of top management to improve the ‘wealth’ of the workers through salary indexation and other social benefits. The accountability space for finance corresponds to the most basic and rational economic view on accounting in which accounting ‘should try to mirror current economic realities’ as well as serve as a form of ‘disciplined control’ (Morgan, 1988).

SCU’s central focus was on the quality of the service it provided, so the space of accountability for service emphasized the quality aspects of SCU’s activities. In particular, several indicators were of importance here, such as: customer loyalty, number of repeat orders, meeting of deadlines, and level of customer satisfaction. According to Mouritsen (1997), accounting performance, customers, and quality in the firm can be ‘intricately interrelated in systems of accountability’ (pp.16–17). This assumption can be illustrated by how the feedback principle was used in the SCU setting. The feedback provided by SCU clients on satisfaction with SCU’s service was used for two purposes: for the SCU managers to consider and improve the quality of their own performance, and for Severstal management to evaluate the work of the corporate university. At the same time, the very fact of surveying customers about their level of satisfaction can be perceived as an element of SCU’s accountability for the quality of their service.

Finally, the space of accountability for knowledge provided accounts that testified about the growth (or decline) of knowledge in the organizational setting. These accounts included non-financial data, figures, and talks regarding the implementation of HR development practices, training programmes, innovative projects, repeat orders, expert knowledge databases, e-learning, and best practices. As the case shows, it is not always possible to quantify ‘knowledge’, and therefore the space of accountability for knowledge extends beyond mere reporting to embrace narrative forms of reporting as well. The accountability space for knowledge can be thought of as the one that characterizes the organization. It can be compared with another ‘accountability space’ indicated in the Quattrone (2004) study and labelled as ‘accountability for the soul’. In this study, to ensure that a religious organization conformed to high spiritual standards and was in this way ‘spiritually legitimate’, it needed accounts about a critical factor—the virtue of its people—which was reflected in the ‘accountability for the soul’.

Three accountability spaces found in the case organization signify those areas important for providing accounts on SCU’s results and performance. In order, however, to explain and justify the economic results, accountability spaces should be ‘mobilized’. This is done with the help of specific justification mechanisms and technologies, which are considered below.

5.2 Three accountability logics

The reflections presented here are based on the assumption that a particular logic is behind any of the justification techniques that are mobilizing the accounts. This reflection derives from the works of Bourdieu (1990), Pickering (2000), Czarniawska (2003), and March and Olsen (2004). March and Olsen (2010) speak about several types of logic: in particular, the logics of appropriateness, consequentiality, and representation. According to Bourdieu (1990), ‘the only way to give an account of practical coherence of practices and works is to construct (generative) models which reproduce... the logic from which that coherence is generated’.

The logic of consequentiality is associated with anticipatory choice and theories of rationality, which can be described as being ‘in touch with reality’ (March and Olsen 2010). This logic questions the consequences of the alternatives for the corporate values, and chooses the alternative that has ‘the best consequences’ (ibid.). Here, the behaviours are driven by ‘preferences and realistic expectations about consequences’ (ibid.). The logic of appropriateness notes that humans perform their actions based on rules of ‘appropriate or exemplary behaviour, organized into institutions’ (March and Olsen, 2004). It defines what is ‘natural, rightful, expected and legitimate’ (ibid.), and calls for doing what is most appropriate for the ‘self’ in any given situation (March and Olsen, 2010). This involves determining ‘what the situation is, what role is being fulfilled and what the obligations of that role are’ (ibid.). This type of logic is not grounded in mathematical constructions, but rather in ethical considerations and other qualitative characteristics. Action is driven by necessity and legitimacy, rather than by pure rationality.

The two first types of logic refer to the logics of action (March and Olsen 2004) and of representation, which is a ‘hybrid’ logic used for all kinds of ‘representational purposes’. It is abstract, ‘rhetorically accomplished’, ‘uses stylized narrative knowledge’, and borrows legitimacy from the logics of theory and practice (Czarniawska, 2001). The nature of this logic is intricate. Its intention is to render and represent those meanings and
knowledge which are constructed in things and events in specific places in concrete moments of time under certain constraints. The task which this logic provides implies a representation of reality, which in fact differs from the reality itself. Meanwhile, the logic of representation is unpredictable in the sense of the picture it may produce, but it is stable in techniques it employs—those belonging to a rhetorical mode.

In relation to this study, justification technologies which were found in the case can be grouped together and connected to one of these logics. Table 3 is a logical continuance of Table 1, as it illustrates groups of justification mechanisms as related to particular types of logic: consequentiality, appropriateness, and representation.

**Table 3: Accountability logics in the SCU accountability settings**

<table>
<thead>
<tr>
<th>ACCOUNTABILITY LOGICS</th>
<th>Consequentiality</th>
<th>Appropriateness</th>
<th>Representation</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>JUSTIFICATION TECHNOLOGY</strong></td>
<td>Calculations, Budget reporting, Benchmarking ‘Justification’ of cost</td>
<td>Feedback culture – formal and non-formal, Questionnaires, Target dialogue and discussions/negotiations, Managing customers’ expectations</td>
<td>Narratives and success stories, Analytical reports, Reports within project system</td>
</tr>
</tbody>
</table>

The first group of technologies under consideration was meant to explain accounts from a financial point of view. The study revealed that the choices related to the facilitation of various projects were often based on economic calculations, rationales, and costs. In order to explain these choices, SCU management employed detailed justification of cost and benchmarking principles, comparing self with others with a consideration of alternative choices for the best results. These account justification techniques imply rational, “practical” thinking, and therefore reflect the logic of consequentiality.

The second group of justification mechanisms, which refer to the logic of appropriateness, mainly relate to the accounts of services provided. In this study the logic of appropriateness can be illustrated by the use of such justification mechanisms as: formal and non-formal (‘gossip’, corporate rumours) feedback culture, a target dialogue approach, and management of customer expectations (which is a preliminary, preceding justification). The goal of using these tools and techniques was mainly connected with the positioning of SCU among its customers and its reputation, ensuring that these mechanisms were functioning properly and the organization had a chance to be well accepted and legitimate. Therefore, justification techniques in this area focused on doing what was ‘appropriate’ in any given circumstances.

Finally, the third group of justification techniques, which relate to the logic of representation, embraced various types of non-financial reports (both oral and written), mainly dedicated to the issues of knowledge growth and enhancement in general. Here, speaking about the logic of representation, we adopt the Durkheimian, French meaning of *représentation* connected to the aim of accurate portrayal. Representation in this sense relates to ideas and ways of evaluating and seeing objects or persons; it is also defined as ‘mental entities’—mental pictures or projections (Pickering, 2000). Representations serve as the key to the knowledge and understanding of mankind, and depict the social order. It is through representation that one can visualize the world ‘beyond that of his immediate senses’ (*ibid.*, p.13). Justification mechanisms in this group include narratives and story-telling, in particular, “success stories”, supplemented by analytical reports, which are “mental projections” and inherent tools of representation.

**5.3 Spaces and Logics Interlinked**

While reviewing Tables 2 and 3 one might juxtapose the content of accounts and techniques for their justification in terms of “themes”, or spaces, and logics. For example, the first group of accounts was related to the “financial space” of accountability, meanwhile the first group of accounts justification techniques was also related to “financial issues”. Simultaneously this group experienced the influence of the logic of consequentiality highlighting economical rationality. The group of accounts related to the issues of service quality and customer satisfaction were mobilized by techniques which assisted in justifying particularly these types of accounts and confirmed to the logic of appropriateness. The same correspondence may be noticed between accounts related to the space of accountability for “knowledge”, and justification techniques related
to the logic of representation correspondingly. Thus a proposition may be suggested that there exists a link between a certain space of accountability and accountability logic. In this particular case the following dyads can be observed: “financial space” as interrelated with the logic of consequentiality, the space of accountability for “service” as linked to the logic of appropriateness, and “knowledge” space as connected with the logic of representation (as shown in the Table 4).

Table 4: Interconnection of accountability spaces and logics

<table>
<thead>
<tr>
<th>Accountability Space</th>
<th>Financial</th>
<th>Service</th>
<th>Knowledge</th>
</tr>
</thead>
<tbody>
<tr>
<td>Accountability Logic</td>
<td>Consequentiality</td>
<td>Appropriateness</td>
<td>Representation</td>
</tr>
</tbody>
</table>

6. Conclusion

This paper set out to explore the issue of accountability for IC in the context of a complex network of actors where one agent (SCU) was accountable to several principals with different objectives, interests, and levels of influence. The complexity of accountability in the given context was approached through the notion of accountability settings, which permitted the definition of several accountability relationships, the content of accounts, and the mechanisms used to justify the results.

The study revealed that accountability settings in the case organization were formed by combinations of two dimensions: spatial and logical. Accountability spaces were defined by the content of accounts; meanwhile, the logical order was tightly coupled with the techniques for the justification of these accounts.

The study examined the spatial dimension of accountability. Referring to the Kirk and Mouritsen (1996) definition of accountability spaces, it provided an illustration of three distinct types of calculation practices and ways of mobilizing systems of accountability in each space. The study revealed that all managerial problems, and hence choices, are a balancing act, where a few (at least two) targets should be reached—for example, minimization of budget costs and maximization of customer satisfaction, or securing SCU’s reputation while balancing resources on hand and the time given to fulfill the project. In the reporting and narrating accountability practice, there exist no clear borders separating these spaces; rather, they are very much intertwined, overlapping and mutually complementing each other.

Furthermore, the paper advanced the meaning of logics for the construction of accountability within the organization. March and Olsen (2004), while noting the importance of the logics of appropriateness and consequentiality, among others, warned against relying exclusively on one of them, and stressed that an account should be given ‘for the relationship and interaction between different logics in different institutional settings’ (p.19). They suggested that different types of logic can be used for different purposes, and under particular conditions these types of logics may be interchanged. This paper continues this line of thought and suggests that this interplay not only occurs between the logics of action but may also embrace ‘hybrid’ logic—the logic of representation (Czarniawska, 2001).

This study provides several contributions to the understanding of accountability for IC in non-profit organizations. First, it illustrates how, in the absence of particular alignment mechanisms, the alignment of stakeholder interests is facilitated by the governing function. This is done through the deployment of several accountability mechanisms, such as client feedback and satisfaction (earlier noted by Twersky et al., 2013), organizational reputation, and ‘corporate rumours’. Second, the spaces of accountability permeate both ‘upward’ accountability to the funders and ‘downward’ accountability to the beneficiaries. Grouping accounts in terms of ‘spaces’ might ease the complexity of accountability choices in the network of the non-profit organization.

Within specific accountability settings, managers may operate and provide accounts in various spaces, and may also use various logics to justify their accounts. This is how accountability is socially constructed. Part of this construction results from finding a balance or compromise among several sometimes contradictory
options: for example, cost vs quality, a task managers must often face in their workplaces. Meanwhile, the task of finding a ‘proper’ balance may be difficult to accomplish, as the mitigating circumstance in providing accountability is that a manager may choose between various types of logics in order to justify their choice. The suggested framework of accountability spaces and logics can be considered as an alternative for companies that have not adopted IC reporting, but would like to provide stakeholders with information concerning IC.

A few words should be said about the limitations of the study. First, only one organization was studied, and therefore it is difficult to generalize the findings from one case—perhaps only at the theoretical level. Second, the study has been carried out only from the point of view of internal accountability, excluding accountability to external bodies, such as public authorities, communities, and other stakeholder groups. Hence, further studies could address the existence of other possible accountability spaces and other types of logic, and the relationship between them.

Appendix 1. List of interviewees at Severstal Corporate University

<table>
<thead>
<tr>
<th>No.</th>
<th>Interviewee</th>
<th>Position</th>
<th>Gender</th>
<th>Number of interviews/ year</th>
<th>Type of interview</th>
</tr>
</thead>
<tbody>
<tr>
<td>2.</td>
<td>Manager</td>
<td>Head of the Centre for Corporate Research</td>
<td>Female</td>
<td>2 (2007 and 2008)</td>
<td>Individual</td>
</tr>
<tr>
<td>3.</td>
<td>Manager</td>
<td>Head of the Centre for Distant Technologies</td>
<td>Female</td>
<td>2 (2007 and 2008)</td>
<td>Individual</td>
</tr>
<tr>
<td>4.</td>
<td>Manager</td>
<td>Head of the Centre for Consultancy</td>
<td>Male</td>
<td>1 (2008)</td>
<td>Individual</td>
</tr>
<tr>
<td>5.</td>
<td>Manager</td>
<td>Head of the Centre for Human Resources</td>
<td>Female</td>
<td>1 (2008)</td>
<td>Individual</td>
</tr>
<tr>
<td>6.</td>
<td>Manager</td>
<td>Head of the Centre for Knowledge Management</td>
<td>Female</td>
<td>2 (2007 and 2008)</td>
<td>Group and individual</td>
</tr>
<tr>
<td>7.</td>
<td>Manager</td>
<td>Head of the Centre for Marketing and PR</td>
<td>Female</td>
<td>1 (2008)</td>
<td>Individual</td>
</tr>
<tr>
<td>8.</td>
<td>Executive</td>
<td>Top 100 program leader, Centre for Training and HR development</td>
<td>Female</td>
<td>1 (2008)</td>
<td>Individual</td>
</tr>
<tr>
<td>9.</td>
<td>Executive</td>
<td>Specialist 1 of the Centre for Knowledge Management</td>
<td>Female</td>
<td>1 (2007)</td>
<td>Group</td>
</tr>
<tr>
<td>10.</td>
<td>Executive</td>
<td>Specialist 2 of the Centre for Knowledge Management</td>
<td>Male</td>
<td>1 (2007)</td>
<td>Group</td>
</tr>
</tbody>
</table>
References


Nadeem, M., Dumay, J. and Massaro, M., 2017. If you can measure it, you can manage it: a case of intellectual capital.


International Lessons in Knowledge Management: A Study of Western & Eastern Manufacturing SMEs

Chayaruk Thanee Tikakul and Avril Thomson
Department of Design, Manufacturing and Engineering Management, Faculty of Engineering, University of Strathclyde, Glasgow, UK
chayaruk.tikakul@strath.ac.uk
avril.thomson@strath.ac.uk

Abstract: In today’s competitive business market, Small and Medium Enterprises (SMEs) are seeking to adopt supporting tools in order to survive. Many large organizations have been successfully implementing Knowledge Management with productivity and efficiency gains cited. SME’s on the other hand are less familiar with this practice with fewer published studies of Knowledge Management focusing on SMEs. Studies which draw global comparisons of Knowledge Management practices in SME’s are particularly rare. The aim of this study is to identify and investigate similarities and differences in Knowledge Management practice between SMEs in UK and Thailand within the manufacturing sector. The objective being to better understand and facilitate the transfer of good practice and lessons between the two countries. Questionnaires investigating Knowledge Management practice have been developed and distributed to SMEs in the Manufacturing Sector across the UK and Thailand. This paper reports on the responses of a total of 384 questionnaires from 36 manufacturing companies from the UK and Thailand. The study covers a range of manufacturing sectors including food and beverage, automotive and aerospace industries etc. Findings are reported from each of the two countries followed by a comparative statistical analysis of the similarities and differences. The results show a significant difference between the numbers of manufacturing SME’s that have implemented a formal knowledge management approach. With significantly more Thai organisations reporting the adoption of formal knowledge management approaches. Similarities exist in the encouragement given to employees for knowledge management activities. Significant difference exists in the barriers that the UK and Thai organisations face in capturing knowledge. The results have the potential to gain improvements and competitive advantage through understanding how knowledge management is influenced by geographic and cultural differences and the transfer of lessons and good practice between Thailand and the UK.

Keywords: Knowledge Management, Small and Medium Enterprises (SMEs), Manufacturing, UK, Thailand

1. Introduction

1.1 Knowledge Management in SMEs in the Manufacturing Industry

Various definitions of Knowledge Management exist depending on context. Knowledge Management is the way in which knowledge is organised and used within a company, or the study of how to effectively organise and use it (Cambridge Business English Dictionary). Knowledge Management is the tools, techniques and strategies to retain, analyse, improve and share business expertise (Groof and Jones, 2003). It can be said that knowledge management is a systematic optimization strategy to improve business and employee performance (Bergeron, 2003). Moreover, if focusing on human resources, it can be defined as awareness of getting the right knowledge to the right people at the right time to improve organisational performance (Seng et al, 2002). Overall, Knowledge Management is the effective and efficient use of knowledge within organization to benefit the customer and of course the company (Macdonald, 1999).

Effective Knowledge Management practice provides the ability to store, analyse, interpret, share and reuse knowledge as an integral daily activity (Saini, 2013). This brings many potential benefits including time saving efficiencies, improved communication and decision making, reduction in rework and improved quality. Accessing these benefits can place an organization in a position of competitive advantage in the global market place.

However, implementing and harnessing the advantages of Knowledge Management can present a number of complex challenges for organisations. Denizhan cites the main knowledge management challenges faced by global business today as defining a knowledge in a working context; dealing with tacit knowledge; utilization of information technology; cultural complexity; human resources and developing new organizational structures (2008).
SME’s often find the challenges and barriers to achieving successful Knowledge Management significantly more difficult than larger organisations. A recent study identifies four main barriers to SME’s capturing knowledge within their organization as social, technological, financial and process (Bhanumathi & Rathb, 2014). McAdam and Reid specifically identify investment as a key barrier to SME’s implementing Knowledge Management (2001). Handling tacit knowledge can prove difficult for most organisations. Tacit knowledge is held by an experienced person making it challenging to articulate, capture and share. This can lead to knowledge disappearing when one key person leaves the company (Bhanumathi and Rathb, 2014). SME’s as smaller organisations can be significantly affected if tacit knowledge held by an experienced individual is lost when they leave the company.

According to the latest Thai white paper report (2015), SME’s account for 80% of overall employment in Thailand. Within manufacturing SMEs account for 67.4% of employment and contribute 22.1% of the total GDP. Manufacturing SMEs with the highest GDP were those in food and beverage industry. The UK Department for Business, Energy and Industrial Strategy (2016), report SMEs accounting for 60% of employment and 47% of turnover in the private sector. Whilst manufacturing SMEs account for only 5% of the total number of SMEs in the UK they contribute 10% in terms of employment and turnover rate.

It is clear that whilst SME’s have huge capacity to gain from the benefits of KM they face significant challenges achieving successful Knowledge Management implementation and practices compared with larger organizations. The manufacturing sector contributes significantly to local and global economy, in terms of employment and turnover but there is little understanding of Knowledge Management practices in Manufacturing SME’s across the globe or how these are influenced by geographic location and culture.

The aim of this study is to gain a better understanding of current international Knowledge Management practice focusing on UK and Thai SMEs in the manufacturing sector and how these might be influenced by culture and nationality. Understanding similarities and differences will allow good practice and lessons to be transferred between the two countries.

### 1.2 Definition of Small and Medium Enterprise (SME’s) in Manufacturing Sector in the UK and Thailand

The definition of an SME in the UK aligns to that of the EU. Three criteria determine SME status these being, number of employees, annual turnover and balance are used to determine three separate size SME categories specifically micro, small and medium. This is captured in Table 1.

<table>
<thead>
<tr>
<th>Enterprise category</th>
<th>Headcount</th>
<th>Annual Turnover</th>
<th>Annual Balance sheet</th>
</tr>
</thead>
<tbody>
<tr>
<td>Micro-sized</td>
<td>less than 10</td>
<td>less than €2 million</td>
<td>less than €2 million</td>
</tr>
<tr>
<td>Small-sized</td>
<td>less than 50</td>
<td>less than €10 million</td>
<td>less than €10 million</td>
</tr>
<tr>
<td>Medium-sized</td>
<td>less than 250</td>
<td>less than €50 million</td>
<td>less than €43 million</td>
</tr>
</tbody>
</table>

Source: European commission, 2005

Thailand adopts a different approach to determine whether a company is an SME. Only two categories of small and medium exist. Definition and categorization depends upon the industry sector, number of employees and value of fixed assets as illustrated in Table 2.

<table>
<thead>
<tr>
<th>Industry Sector</th>
<th>Small Business</th>
<th>Medium Business</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Number of Employees</td>
<td>Fixed Asset (Million THB)</td>
</tr>
<tr>
<td>Manufacturing</td>
<td>less than 50</td>
<td>less than 50</td>
</tr>
<tr>
<td>Service</td>
<td>less than 50</td>
<td>less than 50</td>
</tr>
<tr>
<td>Wholesale</td>
<td>less than 25</td>
<td>less than 50</td>
</tr>
<tr>
<td>Retail</td>
<td>less than 15</td>
<td>less than 50</td>
</tr>
</tbody>
</table>

Source: Ministry of Industry, 2002
2. Literature review

Recent research has identified many benefits to successfully embedded Knowledge Management practices. Organisations capable of harnessing information flow can achieve improved performance, innovation and the ability to create a sustainable competitive advantage (Saini, 2015). Further advantages recognised include significant time reductions in performing data related tasks, better efficiency and staff savings (Yang, 2014) a positive impact on organizational vision and strategy, economies of scale and scope leading to increased profits (Becerra et al, 2004). Despite these benefits organisations can encounter considerable challenges as they embark on their Knowledge Management quest. Shokri-Ghasabeh (2014) found the top three to be lack of employee time, lack of resources and lack of clear guidelines.

Due to resource constraints Small and Medium Sized Enterprises (SME’s) face significantly further challenge (Kevin and Yukika, 2006). SME’s rely on innovation as a matter of survival (Jenet and Alton, 2013). They cannot simply adopt scaled down versions of KM practices found in larger organisations requiring creative approaches to overcome their constraints (Jenet and Alton, 2013). Hutcheson and Quintas (2008) identify that small firms are more likely to adopt informal processes, without the use of the terminology and concepts of KM, to manage knowledge. In a study of Icelandic SME’s (Edvardsson, 2009) clear potential benefits are identified including improved decision making, productivity, market share, reduced costs, more innovation and higher profits. However, lack of time to share knowledge, difficulties in codifying knowledge, and capturing tacit knowledge were found to be barriers. In general, it was found that SME’s lack strategy and formalisation, and rely on an unsystematic manner of sharing and utilising knowledge. Another study, Jenet and Alton (2013) found that reuse of knowledge in SME’s typically centered around the owner of the firm, with them taking control of organizational knowledge only sharing when employees need it to undertake their role, keeping most of the strategic organizational knowledge to themselves. The importance of leaders as role models within SME’s is a critical factor to successful Knowledge Management. Whilst Knowledge Management practices and implementation have been investigated in SME’s it is clear that SME’s require more support in order to achieve success and access the full range of benefits. A recent study, Alexander (2013) identifies several important topics that have not received sufficient attention in previous research these include KM in small and medium enterprises.

Some studies have investigated Knowledge Management practices within SME’s in specific geographical locations. Studies from the West show that SME’s display a surprisingly high awareness of KM in Finnish SME’s and a clear positive correlation between knowledge management maturity and growth (Sari et al, 2005). Despite this it highlights only a minor proportion of the sample SME’s has been able to benefit in terms of growth from their KM-related activities. An Icelandic study shows less than a quarter of firms have a KM programme in place (Edvardsson, 2006), with most investing in simple information and communication technology technologies. It emphasizes the need for implementation of a formal KM strategy to aid success. Whilst a UK based study, Maguire et al. (2007) suggests that SMEs need support in terms of education, training, developing the tools and methods to manage Knowledge Management to achieve the goal.

Certain studies from the eastern globe focus on India, Singapore and Thailand (Bhanumathi, 2014; Jenet and Alton, 2013; Tikakul and Thomson, 2016). Jenet and Alton (2013) provides insights into the distinctiveness of KM processes for SME’s from a study in Singapore. Providing perspectives on the factors influencing KM processes, in particular, the importance of the owners’ knowledge and leadership, the flexibility and adaptability of the organization, and open culture to enable the capitalization of its knowledge assets to survive and stay competitive. A study of Thai SME’s, Tikakul and Thomson (2016) demonstrates that the majority of SME employees consider Knowledge Management to be a beneficial tool with the potential to solve problems. It highlights some of the barriers to KM for SME’s including the greatest barrier to knowledge capture being lack of clear guidelines, with lack of time hindering sharing and storing of knowledge. Another Eastern study based on SME’s in India, Bhanumathi (2014) highlights the need for Indian SMEs to increase the use of knowledge management in their day-to-day business activities. Various challenges and barriers to the implementation of Knowledge Management in Indian SMEs are slow penetration of technology, consumer awareness, cost, lack of need and cultural resistance.

More studies are needed that discuss KM in SMEs, taking country differences into consideration, since it is only natural to assume that KM activities will vary from country to country (Durst and Edvardsson, 2012). One such empirical study carried out in Austria and Switzerland describes methods of knowledge management
supporting the four key knowledge processes in SMEs, i.e. knowledge identification, knowledge acquisition, knowledge distribution and knowledge preservation (Kerstin and Christian, 2009). It proposes a "TechnicalSocialSocialTechnical Model" (TSST Model), which is a balanced system for technical and social knowledge applications. However, this study is based on two countries which share a border, a common language and similar culture. There is a distinct lack of research which highlight similarities and differences between KM practice in SME’s between countries with geographical and cultural disparity and none which compare Western and Eastern practices. This was confirmed through a systematic literature review. Which was conducted in accordance with Ridly (2012). The aim of the review was to gain an understanding of current research on Knowledge Management which draws comparisons between different global locations with a particular emphasis on SME’s within the Manufacturing sector. ProQuest Database was used with various keywords including Knowledge Management, KM, Small and Medium Enterprise, Small and medium firm, SMEs, international, Global and Cross-country were selected. The outcome of these keywords was 299 publications. Each of these abstracts was reviewed with the finding that only 18 of these publications related to Knowledge Management in SMEs. Of these 18 studies it was found that none focused on the manufacturing sector or drew comparisons of Knowledge Management practices between different countries.

Given the challenges that SME’s face globally in the implementation of Knowledge Management, opportunities may exist to share lessons across geographically and culturally disparate locations and improve the ability of SME’s to overcome the barriers they face. This research aims to fill this clear gap and address the following research questions:

Q1. What are the similarities and differences that exist between Knowledge Management practice in SME’s in the West (UK) and East (Thailand) and how are these influenced by culture and nationality?

Q2. Can practices be shared between two different countries to improve the success of SME’s implementing Knowledge Management?

The aim of this study is therefore to identify opportunities for sharing practice between the two countries that will lead to improvements in the success of implementation. Opportunities will be identified by investigating similarities and differences that exist in KM practice between SME’s in the UK and Thailand and how these might be influenced by culture and nationality. This study focuses specifically on the manufacturing industry due to its significant contribution to the economy in both countries. Emphasis on SME’s in one industry, allows accurate comparisons to be made.

3. Research methods

A survey was conducted in Thai and UK manufacturing SME’s adopting a questionnaire for data collection. A questionnaire based approach was selected to address multiple topics, draw clear comparisons, suitability for online implementation (Nardi, 2014), and low cost in terms of time and budget (Gillham, 2008). Particularly important when collecting data in geographically disparate locations.

Guidelines recommended by Sommer & Sommer (2002) and Gillham (2008) were used in the development of the questionnaire. The final questionnaire consisted of 3 parts with 31 questions. Part 1 (7 questions) gathers general information about the company. Part 2 (23 questions) captures data on current KM practice focusing on three themes of capturing, sharing and storing knowledge. Finally, part 3 (1 question) is open ended for recommendations and feedback on current KM approach within the company.

The questionnaire is available in two language versions – English and Thai. Both of which were pilot tested with backward translation used to ensure each versions is well-written, understandable and accurate. Questionnaires were distributed to SMEs in the manufacturing sector in the UK and Thailand between July 2015 – September 2016. Paper based or on-line (Qualtrics) versions depending on participants’ preference were made available. Online version available at https://stratheng.eu.qualtrics.com/jfe/form/SV_baAzjC102IS8BYp.

In Thailand, participants were selected from manufacturing SMEs from across the country. Suitable participants were identified from organisations who previously collaborated with University and Government research as well as personal contacts. Selected SMEs were invited to participate and informed of potential
benefits. Communication was conducted via e-mail, telephone and post. Questionnaires were sent out to 71 Thai SMEs. In total 20 responded, meeting the target with a response rate of 28.17%.

In the UK, participants were selected initially by an internet search of manufacturing SME’s supplemented by companies who had previously collaborated in university research projects. The researcher contacted these companies via telephone call, e-mail and meeting in person to explain the advantages of taking part in the study. Invitations were sent out to 150 SMEs across the UK aiming for 20 responses. A response rate of 10.67% was achieved giving 16 UK companies in total.

It was considerably more difficult to find participants in the UK to compared with Thailand. Often follow up phone calls, emails or visits to explain benefits were required to encourage response. This could be reflective of national culture, Thai’s are more willing to help others especially co-operate with the public sector as universities.

In total 384 completed questionnaires were received from a total of 36 SMEs (73 from 16 UK SMEs and 311 from 20 Thai SMEs). Details of the sectors, sizes and roles of respondents for the UK and Thailand are provided in tables 3 and 7 respectively. To facilitate comparison between the UK and Thailand the size of medium UK companies was restricted to 200 employees. The Manufacturing landscape in both countries is considerably different. This is not surprising given the countries are separated by over 6000 miles, and Thailand is a developing country. This difference is reflected in the various manufacturing business sectors represented by the responding organisations in each country. Whilst this study does not cover the entire manufacturing industry a significant range of sectors are represented across the 36 companies who responded.

The 20 Thai SMEs respondents are located across Thailand and included 8 small and 12 Medium companies. As illustrated in Table 3 the manufacturing business sectors represented include 3 automotive involved in manufacturing car components, 4 manufacture electronic devices such as hard disks, light bulbs, etc. A further 6 manufacture packaging including plastic, non-plastic, food grade, and non-food grade packaging. The remaining 6 represent material and machinery example products include plastic injection molding and machinery components.

The 16 UK companies include 3 Micro, 10 Small and 3 Medium SMEs. Micro companies in Thailand are classified within the small category. The most represented sector in the UK is material and machinery accounting for 11 SMEs who are largely focused on forging and forming of components. The remaining organisations manufacture electronic devices, packaging, aerospace products, furniture and wheelchairs.

Prior to analysis all questionnaires responses were translated in to English. Questionnaire results were then analysed on a question by question basis for the UK and Thai responses separately. The results of this are presented in sections 4 (UK) and 5 (Thailand) of this paper. A comparative analysis between the UK and Thai data was then conducted using the Chi-Square test and Fishers Exact test to identify significant similarities and differences in the responses and hence Knowledge Management practices in UK and Thai SME’s. Initially, all of the UK data is compared with the complete set of Thai data (section 6.1). Following this a comparison is made between the data collected in small UK and Thai companies (section 6.2). Analysing the data universally then based on comparable organisational sizes helps ensure the validity of the comparisons.
4. **Overview of Knowledge Management practice in UK**

This section presents the findings from the UK based questionnaire responses. Table 3 shows business sectors size categories of the SME’s and the employee roles of the total UK participants. In total 73 staff from 16 SMEs across the UK responded. Just under 40% (39.7 %) have management level responsibilities with just over 60% (60.3%) in non-management level positions.

**Table 3: Participant characteristics**

<table>
<thead>
<tr>
<th>Business Sector</th>
<th>Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>Electronic Device</td>
<td>1</td>
</tr>
<tr>
<td>Material and Machinery</td>
<td>11</td>
</tr>
<tr>
<td>Adventure Wheelchair Manufacture</td>
<td>1</td>
</tr>
<tr>
<td>Furniture</td>
<td>1</td>
</tr>
<tr>
<td>Aerospace</td>
<td>1</td>
</tr>
<tr>
<td>Packaging</td>
<td>1</td>
</tr>
<tr>
<td>Total</td>
<td>16</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Size</th>
<th>Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>Micro</td>
<td>3</td>
</tr>
<tr>
<td>Small</td>
<td>10</td>
</tr>
<tr>
<td>Medium</td>
<td>3</td>
</tr>
<tr>
<td>Total</td>
<td>16</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Role of respondents</th>
<th>Frequency (Percentage)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Senior Manager</td>
<td>15 (20.6%)</td>
</tr>
<tr>
<td>Manager</td>
<td>14 (19.2%)</td>
</tr>
<tr>
<td>Senior Engineer</td>
<td>3 (4.1%)</td>
</tr>
<tr>
<td>Engineer</td>
<td>15 (20.6%)</td>
</tr>
<tr>
<td>Supervisor</td>
<td>2 (2.7%)</td>
</tr>
<tr>
<td>Technical</td>
<td>2 (2.7%)</td>
</tr>
<tr>
<td>Operative</td>
<td>10 (13.7%)</td>
</tr>
<tr>
<td>Administrator</td>
<td>6 (8.2%)</td>
</tr>
<tr>
<td>Others</td>
<td>6 (8.2%)</td>
</tr>
<tr>
<td>Total</td>
<td>73</td>
</tr>
</tbody>
</table>

Figure 1 presents the responses to the question “Is there a formal Knowledge Management approach in your organisation?” It illustrates that 41.1% of staff consider there is formal KM approach in their organisation, of those who consider that their organisation has a formal KM approach 66.7% responded that their organisation provides comprehensive information and training on KM prior to the implementation process. Almost 36% of staff feel their organisation does not have a formal Knowledge Management approach, of those 70 percent think that KM could support and improve their work performance.
Figure 1: Knowledge Management approach in their organisation in UK SMEs

Table 4 below presents the findings of the employee perceptions of whether their organisation encourages Knowledge Management practice. It clearly demonstrates that the majority of questionnaire respondents perceive that their organisation encourages every aspect of KM activities including capturing, sharing and storing knowledge.

**Table 4: Employees perception on whether their organisation encourages KM activities in UK SMEs**

<table>
<thead>
<tr>
<th>Does your organisation encourage employees to participate in</th>
<th>Answer</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Capturing Knowledge?</td>
<td>Yes</td>
<td>68.5%</td>
</tr>
<tr>
<td></td>
<td>No</td>
<td>31.5%</td>
</tr>
<tr>
<td>Sharing Knowledge?</td>
<td>Yes</td>
<td>72.6%</td>
</tr>
<tr>
<td></td>
<td>No</td>
<td>27.4%</td>
</tr>
<tr>
<td>Storing Knowledge?</td>
<td>Yes</td>
<td>67.1%</td>
</tr>
<tr>
<td></td>
<td>No</td>
<td>32.9%</td>
</tr>
</tbody>
</table>

Table 5 highlights the approaches UK SME’s actually employ to encourage their staff to participate in Knowledge Management activities. Provision of training, meetings, seminars and conferences are common tools to encourage staff to capture and share knowledge. Implementing IT systems such as company databases and data management systems fully support employees to capturing and storing knowledge.

**Table 5: How the organisation encourages employees to participate in Knowledge Management activities**

<table>
<thead>
<tr>
<th>How the organisation encourages employees to participate in</th>
<th>Capturing</th>
<th>Sharing</th>
<th>Storing</th>
</tr>
</thead>
<tbody>
<tr>
<td>Attending conferences, training and meetings within and outside the organisation</td>
<td>Open communication, everyone has a voice</td>
<td>Providing company database</td>
<td></td>
</tr>
<tr>
<td>Using continuous improvement mechanism</td>
<td>Organising seminars and workshops within the organisation</td>
<td>Using storage and index system</td>
<td></td>
</tr>
<tr>
<td>Providing IT systems to make it easy to capture knowledge</td>
<td>Cross-department meetings to share with the rest of workforce</td>
<td>Mandatory to store project / work procedure information</td>
<td></td>
</tr>
<tr>
<td>Writing reports on project output for future reference</td>
<td>Working as a group and using team approach to solve the problem</td>
<td>Using data management system</td>
<td></td>
</tr>
</tbody>
</table>

Table 6 highlights the biggest barriers identified by participants to different types of KM activities within their organisations. Specifically it considers barriers to capturing, sharing and storing knowledge. Barriers to sharing...
knowledge have been separated into practical barriers such as IT issues, organizational policy and procedural challenges etc. and cultural barriers i.e. lack of trust, willingness to share etc. From table 6, it can be seen that lack of time is an issue for both sharing and storing knowledge with approximately half of respondents highlighting this as a major issue.

**Table 6:** The biggest barrier to Knowledge Management activity in UK SMEs

<table>
<thead>
<tr>
<th>The biggest barrier to</th>
<th>UK</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>capturing your knowledge</td>
<td>Lack of clear guidelines on KM approach</td>
<td>37.0%</td>
</tr>
<tr>
<td>sharing your knowledge (practical barrier)</td>
<td>Lack of Time</td>
<td>50.7%</td>
</tr>
<tr>
<td>sharing your knowledge (cultural barrier)</td>
<td>Lack of awareness of other people needs/requirement</td>
<td>38.4%</td>
</tr>
<tr>
<td>storing your knowledge</td>
<td>Lack of Time</td>
<td>48.0%</td>
</tr>
</tbody>
</table>

5. **Overview of Knowledge Management Practice in Thailand**

This section presents the findings from the Thai based questionnaire responses. Table 7 shows business sectors represented by the participating organisations together with the size categories of the SME’s and the employee roles of the Thai participants. In total 311 staff from 20 SMEs across the Thailand responded. Just over 10% (10.6 %) have management level responsibilities with the remainder in non-management level positions.

**Table 7:** Participant characteristic

<table>
<thead>
<tr>
<th>Business Sector</th>
<th>Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>Automotive</td>
<td>3</td>
</tr>
<tr>
<td>Electronic Device</td>
<td>4</td>
</tr>
<tr>
<td>Material and Machinery</td>
<td>5</td>
</tr>
<tr>
<td>Packaging</td>
<td>6</td>
</tr>
<tr>
<td>Food and Beverage</td>
<td>1</td>
</tr>
<tr>
<td>Other</td>
<td>1</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>20</strong></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Size</th>
<th>Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>Small</td>
<td>8</td>
</tr>
<tr>
<td>Medium</td>
<td>12</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>20</strong></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Role of respondents</th>
<th>Frequency (Percentage)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Senior Manager</td>
<td>7 (2.3%)</td>
</tr>
<tr>
<td>Manager</td>
<td>26 (8.4%)</td>
</tr>
<tr>
<td>Senior Engineer</td>
<td>2 (0.6%)</td>
</tr>
<tr>
<td>Engineer</td>
<td>13 (4.2%)</td>
</tr>
<tr>
<td>Supervisor</td>
<td>66 (21.2%)</td>
</tr>
<tr>
<td>Technical</td>
<td>27 (8.7%)</td>
</tr>
<tr>
<td>Operative</td>
<td>118 (37.9%)</td>
</tr>
<tr>
<td>Administrator</td>
<td>43 (13.8%)</td>
</tr>
<tr>
<td>Others</td>
<td>9 (2.9%)</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>311</strong></td>
</tr>
</tbody>
</table>
Figure 2: Knowledge Management approach in their organisation in Thai SMEs

Figure 2 illustrates how employees consider the status of KM in their company. It can be seen that almost 80 percent of Thai respondents consider there is formal KM approach in their organisation with 95 percent of these reporting that the company provide comprehensive information and training prior to the implementation process. Just under 16% of Thai participants consider there to be no formal Knowledge Management approach in their organisation 80 percent of which believe that KM will improve their work performance.

Table 8 below presents employee perceptions of whether their organisation encourages Knowledge Management practice. It clearly demonstrates the majority of questionnaire respondents perceive their organisation encourages every aspect of KM activities including capturing, sharing and storing knowledge. However, the perception is that encouragement for storing knowledge is slightly less than other KM activities at just over 60%.

Table 8: Employees perception on organisation encouragement on KM activities in Thai SMEs

<table>
<thead>
<tr>
<th>Does your organisation encourage employees to participate in</th>
<th>Answer</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Capturing Knowledge?</td>
<td>Yes</td>
<td>65.6%</td>
</tr>
<tr>
<td></td>
<td>No</td>
<td>34.4%</td>
</tr>
<tr>
<td>Sharing Knowledge?</td>
<td>Yes</td>
<td>69.8%</td>
</tr>
<tr>
<td></td>
<td>No</td>
<td>30.2%</td>
</tr>
<tr>
<td>Storing Knowledge?</td>
<td>Yes</td>
<td>60.5%</td>
</tr>
<tr>
<td></td>
<td>No</td>
<td>39.6%</td>
</tr>
</tbody>
</table>

Table 9 presents the responses of how the organisation actually encourages employees. Arranging meetings and training is also common practice in Thai SMEs. Furthermore, there are several additional approaches that Thai SMEs employ to encourage their staff to share knowledge such as incentives and using public address systems during breaks to share knowledge. While provision of company databases and establishing standard processes is adopted support storing knowledge.
Table 9: How the organisation encourages employees to participate in Knowledge Management activities

<table>
<thead>
<tr>
<th>Activities</th>
<th>Capturing</th>
<th>Sharing</th>
<th>Storing</th>
</tr>
</thead>
<tbody>
<tr>
<td>Arrange internal and external meeting / training</td>
<td>Arranging seminar / training / meeting within organisation</td>
<td>Providing company database</td>
<td></td>
</tr>
<tr>
<td>Morning Talk</td>
<td>Show and Share activities</td>
<td>Using ISO as a guideline</td>
<td></td>
</tr>
<tr>
<td>Using standard form to record new knowledge</td>
<td>Experienced staff to teach and work along with new staff</td>
<td>Setting and implement standard process</td>
<td></td>
</tr>
<tr>
<td>Applying Kaizen in to the job</td>
<td>Incentive</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Morning Talk</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table 10 highlights the biggest barriers identified by Thai SME participants to different types of KM activities. More than half of employees believe that lack of clear guidelines is an issue for capturing knowledge. While the biggest barrier for sharing and storing knowledge is lack of time.

Table 10: The biggest barrier to Knowledge Management activity in Thai SMEs

<table>
<thead>
<tr>
<th>The biggest barrier to</th>
<th>Thailand</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>capturing knowledge</td>
<td>Lack of clear guidelines on Knowledge Management approach</td>
<td>55.0%</td>
</tr>
<tr>
<td>sharing knowledge (practical barrier)</td>
<td>Lack of Time</td>
<td>49.5%</td>
</tr>
<tr>
<td>sharing knowledge (cultural barrier)</td>
<td>Knowledge sharing is extra workload</td>
<td>30.6%</td>
</tr>
<tr>
<td>storing knowledge</td>
<td>Lack of Time</td>
<td>39.9%</td>
</tr>
</tbody>
</table>

6. Comparative Analysis Study

6.1 Complete Data Set

The Chi – Square test (significance level of 0.05) was applied to determine if an association exists between location (UK and Thailand) and perceived existence of a formal Knowledge Management approach (Figures 1 and 2 above). In this section all of the responses received from Thailand and the UK are compared.

Table 11: The Chi-Square Test - Knowledge Management approach within organisation – Complete data set

<table>
<thead>
<tr>
<th>Is there a formal KM approach in your organisation?</th>
<th>Yes</th>
<th>No</th>
<th>Do not know</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Location</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>UK</td>
<td>30</td>
<td>26</td>
<td>17</td>
<td>73</td>
</tr>
<tr>
<td>Thailand</td>
<td>243</td>
<td>49</td>
<td>19</td>
<td>311</td>
</tr>
<tr>
<td>Total</td>
<td>273</td>
<td>75</td>
<td>36</td>
<td>384</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Location</th>
<th>Chi Square</th>
<th>Degrees of Freedom</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Is there a formal KM approach in your organisation?</td>
<td>41.96</td>
<td>2</td>
<td>0.00</td>
</tr>
</tbody>
</table>
As the results in Table 11 show the P-value (0.00) is less than the significance level (0.05). Clearly highlighting that there is a statistically significant difference between the UK and Thailand and perception of formal Knowledge Management within organisations.

The Chi-Square test was also used to investigate differences between Thai and UK SME’s on how organisations are perceived to encourage their employees in capturing, sharing and storing knowledge.

**Table 12: The Chi-Square Test - company encouragement in KM activities – complete data set**

<table>
<thead>
<tr>
<th>Location</th>
<th>Capturing Knowledge</th>
<th>Sharing Knowledge</th>
<th>Storing Knowledge</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Yes</td>
<td>No</td>
<td>Total</td>
</tr>
<tr>
<td>UK</td>
<td>50</td>
<td>23</td>
<td>73</td>
</tr>
<tr>
<td>Thailand</td>
<td>204</td>
<td>107</td>
<td>311</td>
</tr>
<tr>
<td>Total</td>
<td>254</td>
<td>130</td>
<td>384</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Location</th>
<th>Chi Square</th>
<th>Degrees of Freedom</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>0.22</td>
<td>1</td>
<td>0.64</td>
</tr>
<tr>
<td></td>
<td>0.23</td>
<td>1</td>
<td>0.63</td>
</tr>
<tr>
<td></td>
<td>1.11</td>
<td>1</td>
<td>0.29</td>
</tr>
</tbody>
</table>

In Table 12, the p values of 0.64, 0.63 and 0.29 indicate that there is not a statistically significant difference between the two locations and how organisations encourage employees to participate in KM activities.

**Table 13: Similarities and differences between how UK and Thai SMEs’ encourage KM activities**

<table>
<thead>
<tr>
<th></th>
<th>Similarities</th>
<th>Differences</th>
</tr>
</thead>
<tbody>
<tr>
<td>Capturing Knowledge</td>
<td>External and Internal Meetings</td>
<td>UK SMEs Writing final report on project output for future reference</td>
</tr>
<tr>
<td></td>
<td>Conferences, Workshops and Seminars</td>
<td>Providing IT system to make it easy to capture knowledge</td>
</tr>
<tr>
<td></td>
<td>Using Continuous Improvement in UK while applying Kaizen in Thailand</td>
<td>Thai SMEs Daily Morning Talk activity</td>
</tr>
<tr>
<td></td>
<td>Using standard format to record new knowledge</td>
<td></td>
</tr>
<tr>
<td>Sharing Knowledge</td>
<td>Seminars, training and meetings within organisation</td>
<td>UK SMEs Working as a group and using team approach to solve the problem</td>
</tr>
<tr>
<td></td>
<td>Everyone in organisation can get involved with sharing knowledge facilitated by open communication in UK and Show and Share activities in Thailand</td>
<td>Cross-department meeting to share with the rest of workforce</td>
</tr>
<tr>
<td></td>
<td>Morning Talk activity</td>
<td>Thai SMEs Experienced staff work with new staff 1:1</td>
</tr>
<tr>
<td></td>
<td>Incentives</td>
<td></td>
</tr>
<tr>
<td>Storing Knowledge</td>
<td>Providing company database</td>
<td>UK SMEs Mandatory to store project / work procedure information</td>
</tr>
<tr>
<td></td>
<td>Setting and implementing standard process and guideline in Thailand and using storage and index system in UK.</td>
<td>Using data management system</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Thai SMEs Using ISO as a guideline</td>
</tr>
</tbody>
</table>
Table 13, clearly shows that arranging training and seminars are key activities adopted in both Thai and UK SME’s to encourage employees to participate in capturing and sharing knowledge. However, Thai SME’s also adopt the ‘daily morning talk’ to encourage staff to capture and share knowledge. Thai employees also highlighted the use of public address systems and incentives as key motivations to share knowledge in their organisations. Whereas, UK SME’s are more likely to employ a team work approach to stimulate these activities. Provision of company databases and guidelines for the use of the database is common practice in both countries. UK employees also state the mandatory nature of storing project information and knowledge to avoid similar mistakes being made in the future.

Finally the Chi-Square Test was applied to determine the relationship between location and barriers to KM.

**Table 14:** The Chi-Square Test – Barriers to Knowledge Management activities – Complete Data Set

<table>
<thead>
<tr>
<th>Location</th>
<th>In your opinion, which of the following is the biggest barrier to capturing your knowledge?</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Lack of motivation</td>
<td>Lack of clear guidelines on KM approach</td>
</tr>
<tr>
<td>UK</td>
<td>10</td>
<td>27</td>
</tr>
<tr>
<td>Thailand</td>
<td>68</td>
<td>171</td>
</tr>
<tr>
<td>Total</td>
<td>78</td>
<td>198</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Location</th>
<th>In your opinion, which of the following is the biggest barrier to sharing your knowledge?</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Lack of Time</td>
<td>Poor IT Tools / Poor Technology</td>
</tr>
<tr>
<td>UK</td>
<td>37</td>
<td>7</td>
</tr>
<tr>
<td>Thailand</td>
<td>154</td>
<td>42</td>
</tr>
<tr>
<td>Total</td>
<td>191</td>
<td>49</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Location</th>
<th>In your opinion, which of the following is the biggest barrier to storing your knowledge?</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Lack of Time</td>
<td>Poor IT Tools / Poor Technology</td>
</tr>
<tr>
<td>UK</td>
<td>35</td>
<td>8</td>
</tr>
<tr>
<td>Thailand</td>
<td>124</td>
<td>65</td>
</tr>
<tr>
<td>Total</td>
<td>159</td>
<td>73</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Location</th>
<th>Chi Square</th>
<th>Degrees of Freedom</th>
<th>Fishers Exact Test</th>
<th>p-value</th>
<th>Capturing your knowledge?</th>
<th>Sharing your knowledge?</th>
<th>Storing your knowledge?</th>
</tr>
</thead>
<tbody>
<tr>
<td>UK</td>
<td>20.22*</td>
<td>4</td>
<td>19.33</td>
<td>0.00</td>
<td>5.91*</td>
<td>5.38</td>
<td>10.65*</td>
</tr>
<tr>
<td>Thailand</td>
<td>3.19*</td>
<td>5</td>
<td>10.39</td>
<td>0.06</td>
<td>10.65*</td>
<td>10.65*</td>
<td>10.65*</td>
</tr>
</tbody>
</table>

*Note: The Chi-Square approximation may be inaccurate - expected frequency less than 5.*

:*Fishers Exact Test consider to replace Chi-Square
The table 14 above shows the relationship between barriers to Knowledge Management activities and location. The first column on the left of the table refers to barriers to capturing knowledge, the middle column to sharing knowledge and the right hand side column deals with storing knowledge. The results show there is not a significant difference in the barriers that UK and Thai manufacturing SME’s face in sharing and storing knowledge the biggest being lack of time. However, there is a significant difference between both countries and the barriers in capturing knowledge (p<0.05). In Thailand the biggest barrier to capturing knowledge is lack of clear guidelines on knowledge management approach. Whilst lack of time and clear guidelines are identified as barriers to capturing knowledge in the UK.

6.2 Comparative analysis of small companies

This section focusses on comparing data collected in small sized SMEs in the UK and Thailand. Questions from section 6.1 are reanalyzed using only data from the small companies. UK companies were restricted to 200 employees allowing a direct comparison with Thai companies. Fisher’s Exact Test was applied to determine the association between location (UK and Thailand) and perception of a formal KM approach (significance level of 0.05).

Table 15: Fisher’s Exact Test - Knowledge Management approach – Small Companies

<table>
<thead>
<tr>
<th>Location</th>
<th>Is there a formal KM approach in your organisation?</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Yes</td>
</tr>
<tr>
<td>UK</td>
<td>12</td>
</tr>
<tr>
<td>Thailand</td>
<td>92</td>
</tr>
<tr>
<td>Total</td>
<td>104</td>
</tr>
</tbody>
</table>

Fisher’s Exact Test 31.701
P-value 0.00

As the results in Table 15 show the P-value (0.00) is less than the significance level (0.05). Clearly highlighting there is a statistically significant difference between location and perception of a formal Knowledge Management approach.

The Chi-Square test was then applied to investigate differences between small SMEs in the UK and Thailand and how they encourage their employees in capturing, sharing and storing knowledge.
Table 16: The Chi-Square Test - encouragement of Knowledge Management activities – Small Companies

<table>
<thead>
<tr>
<th>Location</th>
<th>Yes</th>
<th>No</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>UK</td>
<td>24</td>
<td>19</td>
<td>43</td>
</tr>
<tr>
<td>Thailand</td>
<td>75</td>
<td>50</td>
<td>125</td>
</tr>
<tr>
<td>Total</td>
<td>99</td>
<td>69</td>
<td>168</td>
</tr>
</tbody>
</table>

Does your organisation encourage employees to participate in Capturing Knowledge? Sharing Knowledge? Storing Knowledge?

Does your organisation encourage employees to participate in Capturing Knowledge? Sharing Knowledge? Storing Knowledge?

<table>
<thead>
<tr>
<th>Location</th>
<th>Chi Square</th>
<th>Degrees of Freedom</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>UK</td>
<td>0.232</td>
<td>1</td>
<td>0.630</td>
</tr>
<tr>
<td>Thailand</td>
<td>0.951</td>
<td>1</td>
<td>0.329</td>
</tr>
<tr>
<td>Total</td>
<td>0.367</td>
<td>1</td>
<td>0.544</td>
</tr>
</tbody>
</table>

As shown in Table 16, the p value of 0.630, 0.329 and 0.544 indicates no significant difference between Thailand and the UK for encouragement of employees in Knowledge Management activities.

Finally, Fisher’s Exact Test was applied to determine the relationship between location and barriers to KM.

Table 17: Fisher’s Exact Test - barriers to Knowledge Management activities – Small Companies

<table>
<thead>
<tr>
<th>Location</th>
<th>Lack of motivation</th>
<th>Lack of clear guidelines on KM approach</th>
<th>Lack of time</th>
<th>Lack of resource</th>
<th>Others</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>UK</td>
<td>6</td>
<td>19</td>
<td>13</td>
<td>4</td>
<td>1</td>
<td>43</td>
</tr>
<tr>
<td>Thailand</td>
<td>25</td>
<td>67</td>
<td>22</td>
<td>4</td>
<td>7</td>
<td>125</td>
</tr>
<tr>
<td>Total</td>
<td>31</td>
<td>86</td>
<td>35</td>
<td>8</td>
<td>8</td>
<td>168</td>
</tr>
</tbody>
</table>

In your opinion, which of the following is the biggest barrier to capturing your knowledge?

In your opinion, which of the following is the biggest barrier to sharing your knowledge?

<table>
<thead>
<tr>
<th>Location</th>
<th>Lack of Time</th>
<th>Poor IT Tools / Poor Technology</th>
<th>Organisational policy</th>
<th>Poor KM System / Software</th>
<th>Poor KM Process</th>
<th>Others</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>UK</td>
<td>18</td>
<td>4</td>
<td>5</td>
<td>5</td>
<td>8</td>
<td>3</td>
<td>43</td>
</tr>
<tr>
<td>Thailand</td>
<td>54</td>
<td>21</td>
<td>21</td>
<td>7</td>
<td>19</td>
<td>3</td>
<td>125</td>
</tr>
<tr>
<td>Total</td>
<td>72</td>
<td>25</td>
<td>26</td>
<td>12</td>
<td>27</td>
<td>6</td>
<td>168</td>
</tr>
</tbody>
</table>
In your opinion, which of the following is the biggest barrier to storing your knowledge?

<table>
<thead>
<tr>
<th>Location</th>
<th>Lack of Time</th>
<th>Poor IT Tools / Poor Technology</th>
<th>Organisational Policy</th>
<th>Poor KM System / Software</th>
<th>Poor KM Process</th>
<th>Others</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>UK</td>
<td>17</td>
<td>6</td>
<td>3</td>
<td>8</td>
<td>7</td>
<td>2</td>
<td>43</td>
</tr>
<tr>
<td>Thailand</td>
<td>48</td>
<td>34</td>
<td>19</td>
<td>11</td>
<td>11</td>
<td>2</td>
<td>125</td>
</tr>
<tr>
<td>Total</td>
<td>65</td>
<td>40</td>
<td>22</td>
<td>19</td>
<td>18</td>
<td>4</td>
<td>168</td>
</tr>
</tbody>
</table>

In your opinion, which of following is the biggest barrier to capturing your knowledge?

<table>
<thead>
<tr>
<th>Location</th>
<th>Capturing your knowledge?</th>
<th>Sharing your knowledge?</th>
<th>Storing your knowledge?</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chi Square</td>
<td>6.861*</td>
<td>5.510*</td>
<td>9.661*</td>
</tr>
<tr>
<td>Degrees of Freedom</td>
<td>4</td>
<td>5</td>
<td>5</td>
</tr>
<tr>
<td>Fishers Exact Test</td>
<td>6.418</td>
<td>5.532</td>
<td>9.741</td>
</tr>
<tr>
<td>p-value</td>
<td>1.53</td>
<td>0.342</td>
<td>0.070</td>
</tr>
</tbody>
</table>

The results of Fisher’s Exact Test (Table 17) show that there is not a significant difference in the barriers that small sized SMEs in UK and Thai in manufacturing sector face in capturing, sharing and storing knowledge (p<0.05). As reported in table 17 the biggest barrier small sized SMEs in the UK and Thailand face when sharing and storing knowledge is lack of time. Their biggest barrier to capturing knowledge is lack of clear guidelines.

7. Discussion and conclusion

This study reports on the results of a questionnaire investigating Knowledge Management practices in both Thai and UK manufacturing SME’s. In particular, it statistically analyses the similarities and differences in the KM practices between the two countries. SME’s in the Manufacturing sector play a significant and critical role in the economy of both countries in terms of employment and turnover. There is currently no evidence of any existing studies which investigate and draw comparisons between Knowledge Management practice in Thai and UK manufacturing SME’s. Knowledge Management has the ability to improve efficiency and profit of organisations hence there is potential to transfer lessons between the two countries. Each of the original two research questions will be addressed and discussed.

Considering the first research question - what are the similarities and differences that exist between Knowledge Management practice in SME’s in the West (UK) and East (Thailand) and how are these influenced by culture and nationality?

**Similarities**

Across the manufacturing sector no significant difference exists in the encouragement that organisations give their employees in engaging with Knowledge Management activities. Both Thai and UK manufacturing SME’s strongly encourage Knowledge Management activities. This encouragement is not surprising as large organisations have reported significant gains and benefits from the adoption of Knowledge Management.

This aligns with previous research by Edvardsson and Durst (2013) which stated that SMEs can benefit from Knowledge Management in term of employee development, innovation, customer satisfaction and organisational success.

Although, SMEs cannot just scale down the Knowledge Management activities adopted within large organisations (Jenet and Alton, 2013). SMEs are capable of encouraging Knowledge Management in their organisation. As can be seen more than 65% of employees in UK SMEs perceive that their organisation encourages them to participate in Knowledge Management activities which include capturing, sharing and storing. In Thailand this is slightly lower at 60%. Once both Thai and UK SMEs recognise the benefits of
Knowledge Management, they are willing to implement Knowledge Management and fully encourage their employees to engage to gain maximum benefit.

Barriers to Knowledge Management are similar for sharing and storing knowledge with no significant difference between Thailand and the UK. Both identify lack of time as the biggest challenge. Most SME employees focus on their daily or short term tasks. This may lead to resistance to spending time on KM related activities opting instead to spend time on their particular individual task(s). This may because the employees do not see the tangible benefit of Knowledge Management. Whilst there is a general understanding that Knowledge Management helps to improve organisational performance, individuals may not recognise immediate tangible benefits.

**Differences**

The results show that there is a significant difference between formal Knowledge Management approaches in UK and Thai SME’s. Thailand demonstrates a significantly higher percentage of manufacturing SME’s with a formal Knowledge Management approach (78.1%) whilst in the UK report 41.1%. These results show potential for transferring lessons from Thailand to the UK in terms of adopting a formal Knowledge Management approach.

It is surprising that there is more formal Knowledge Management in Thai SMEs than UK SMEs, as there is limited published research on Knowledge Management in Thai SME’s. It appears that Knowledge Management is more wide spread in Thai manufacturing SMEs. This may because Knowledge Management does not require high investment. Furthermore, most SMEs in Thailand are family oriented businesses with top down management. As part of Thai culture, junior staff are typically very respectful of their managers. Managers act as decision makers and central leaders. Non-management staff would not routinely question organisational process or procedure but simply what they are asked to do. Therefore, if there is a management lead strategy to implement Knowledge Management within an organization staff will follow the policy. This corresponds to previous research by Jenet and Alton (2013) who cite the importance of leadership as a critical success factor of successful in Knowledge Management implementation.

The other factor that may account for the high percentage in Thailand is questionnaire bias. Thai people are culturally always polite and respectful to others seldom criticising. For this reason, they will typically provide positive feedback when completing questionnaires, which may have resulted in skewed results.

A significant difference exists in the barriers to capturing knowledge. In the UK lack of time and lack clear guidelines hamper knowledge capture. Whist in Thailand lack of time is not reported to be an issue when capturing knowledge. This may be attributed to cultural differences between the two nations i.e. willingness to help others and patience. UK workers tend to be task oriented and driven to moving on to the next task without taking time to reflect. Whilst Thai workers are more likely to take time to reflect and help others. As patient people, Thai workers may be more willing to spent time capturing new knowledge that has been generated.

**Sharing Practice Between Countries**

This study suggests that UK SME’s can potentially learn and improve their practices from Thailand. In response to research Q2 ‘Can practices be shared between two different countries to improve the success of SME’s implementing Knowledge Management? It is clear that where the greatest differences occur between the two countries’ respective responses is where the biggest opportunities exist.

There is potential for UK SME’s to learn from Thai SME Knowledge Management practices, in particular, how management communicate and allocate new policies and strategies to employees. UK SMEs could consider how Thai SME’s typically adopt ‘the morning talk session’ to encourage employees to capture and share knowledge. Morning talk session is 5-15 mins meeting before the commencement of every working day where employees can share details of their current tasks and activities, share problems and seek advise etc. As well as, the public address system adopted during work breaks or lunchtimes which Thai SME’s again use as a key opportunity to communicate with their staff. Furthermore UK SME’s could learn from the reflective and patient culture adopted in Thai SME’s this may be helpful for capturing knowledge.
On the other hand, Thai SMEs could in turn learn from some UK practices. Specifically, at the closing stages of projects. UK SME’s cited the common practice of conducting project review meetings at the end of each project in collaboration with writing a mandatory report detailing project output. The main purpose of the meeting is retaining and transferring knowledge in conjunction with identifying lessons learned. The final project output report should detail what went well, challenges, lesson learned together with any other information that could benefit future projects. These are beneficial to organisations in helping to avoid repetition of mistakes. Furthermore, they can prove useful in building on past knowledge to finding better solutions for future projects. Currently, some Thai SMEs apply ISO standards as a guideline for storing knowledge in the organization. ISO standard is required for document and records control which means the company must have procedures for controls of documents and records. Additionally, ISO standard could be applied to benefit SMEs in the area of capturing and sharing knowledge.

Thai SMEs could learn how to implement and use IT and data management systems similar to UK SME practice. In particular how best to make decisions of which IT and data management system is appropriate for their company. This could help Thai SMEs improve the capturing and storing knowledge. IT and data management system in Thailand are more widely adopted in large companies.

Another solution commonly adopted by Thai SME’s to encourage employees in capturing their knowledge is to provide incentives to their staff such as bonuses at the end of the year, cash, extra holiday, small gifts or it owns product. Furthermore, assigning experienced staff to teach and work along with fresh employees is another method that is applied in Thai SMEs to increase knowledge sharing in organisations. Thai employees are focused on the importance of personal relationships with work colleagues. They are willing to spend time patiently building relationships with colleagues and developing trust which is beneficial to successful KM implementation from which the UK could learn.

Limitations and Future Work

Further, investigation is required to draw more transferable lessons between Thailand and the UK. Detailed case studies could be used to explore these findings further and develop a framework for improvement. Future work could also focus on exploring specific sectors within the manufacturing industry. As manufacturing SME’s contribute significantly to the employment rate and the economy in both Thailand and the UK improvements and benefits gained from better Knowledge Management practices have the potential to improve the competitiveness of both countries in the global market place.

A key challenge of this study was finding participants in the United Kingdom. Less UK companies were willing to participate in the study in comparison to Thailand. Despite there being less UK participants, data collection in took longer. It took 1 year to collect data from 16 UK SME’s whilst it took only 2 months to collect data from Thai SME’s. This difference may also be due to Thai culture. Thai people appear more willing to provide collaboration with government and educational institutions. As a result there were considerably more Thai respondents in the study which may have influenced the results. Furthermore, as discussed in the conclusions, there is potential that Thai culture may have caused a positive bias.

References


Abstract: The importance of universities as knowledge hubs is increasing due to knowledge production via research and teaching. An emerging aspect of knowledge management literature is the study of the knowledge requirements of universities. In particular, the transformation from knowledge creation to knowledge sharing has proved to be important in the university context and is subject to cultural differences. For example, previous research has indicated that a physician’s Tacit Knowledge Capacity (TKC) is affected by social software and social media. This creates opportunities to carry out new research on different occupations that have an intense TKC.

As part of this research, a survey was conducted in order to assess the TKC of lecturers in both Germany and North Cyprus. These are two countries that have universities providing knowledge management programmes. The research determined the TKC in both countries and compared the two in order to determine if cultural factors affect the TKC of the profession. Through this research, the authors aimed to contribute to the ongoing research on the knowledge requirements of universities that will enable them to be knowledge intensive institutions. The Faculty of Economics and Administrative Sciences at Near East University, which has 2200 students and 20 chairs, was compared with the Faculty of Business and Economics at the Technische Universität Dresden, which has 2800 students and 23 chairs. The study was carried out to provide an intercultural comparison, which is currently lacking in the Knowledge Management field. The research findings have highlighted the factors influencing the transfer and the accumulation of tacit knowledge.

Keywords: Tacit Knowledge, Knowledge Accumulation, Knowledge Transfer, Tacit Knowledge Capacity, Higher Education, Universities

1. Introduction

Polanyi (1966) argued that we can know more than we can tell, and Hayek (1952) focused on how our mind generates this tacit knowledge. Even though the relation between these scholars and their thoughts have been subject to multiple scientific discussions in the recent years, Scheall (2016) concludes that “it is possible for an individual to possess an item of knowledge without explicitly knowing that they possess this knowledge, and, thus, without being able to state, perhaps even in principle, how they came by this knowledge” (p. 207). Tacit knowledge as opposed to explicit knowledge is embedded within an individual’s cognitive framework (Dalkir, 2011) and is the starting point of the market interactions of individuals, which generates market quasi-knowledge (Butos, 2003). Knowledge relevant for the market is considered as quasi-knowledge rather than knowledge because of the non-predictable character of knowledge in the non-conscious, non-teleological way the market evolves (Butos, 2003; Koppl, 2003).

Recent findings of neuroscience (Erkut, 2016a; Srivastava and Sharma, 2017; Erkut et al., 2018) point out to the fact that perception is actually a classification of the world according to the categories in our mind, which is organised based on hierarchical networks shaping four future perceptions. Furthermore, transactions within the cortex are occurring spontaneously; they are incomplete in their nature and self-organised (Fuster, 2011; Erkut et al., 2018). These all point out to the fact that the subjectivity of knowledge is indeed not a philosophical metaphor, but rather the result of the interaction processes in the cortex of human mind. Hence, for organisations focusing on the generation of knowledge, it is certain that the process of generating and organising knowledge cannot occur in a top-down, centrally planned way but has to be bottom-up (Erkut, 2016b) and based on the individuals that constitute the organisation. The challenge for the managerial level in such knowledge-intensive organisations is therefore to create the conditions of the emergence of knowledge; these can be factors that can accelerate either the accumulation of knowledge or its transfer (Kaya and Sagsan, 2015; Kaya and Erkut, 2017).
Since the process of generating knowledge on the organisational level is primarily self-organised, it cannot be planned in advance but rather need to be utilised for an efficient knowledge management (KM) procedure. The unanticipated character of new knowledge is described by Kirzner (1997) as sheer knowledge, i.e. a person cannot know what he cannot know. This is the same for the management level. Taken a university as an example, the university administration cannot anticipate what will be discovered in a certain research project. It can be anticipated that there will be some results (positive or negative), meaning that the character of discovery can be anticipated; but not the exact discovery itself. Hence, it cannot be planned. This distinction is known in the literature as the distinction between genotypic and phenotypic changes in the economy, where the former cannot be predicted, and the latter has a predictable character (Lehmann-Waffenschmidt, 1990). Since the generation of novelties such as a discovery builds upon the knowledge basis of employees in a university setup, managing their knowledge can be a key factor for the acceleration of the discovery and the use of new knowledge.

KM procedures enable accessing, using, generating, transferring and embedding knowledge (Nonaka et al, 2000; Mellor, 2011). As knowledge hubs, universities generate knowledge “through teaching and research, and attract knowledge by investing in new staff, staff mobility, and staff scientific networks” (Martinez- Fernandez and Sharpe, 2008, p. 49). They therefore have specific knowledge requirements (Harvey, 2008) which may differ from other sectors. As a contrast, financial sector can be taken as an example (Sarigianni et al, 2016; Kaya and Erkut, 2017): A financial sector organisation’s knowledge requirements are like a two-edged sword, on the one hand the flow of tacit knowledge within that organisation is vital for its service-dominated character; on the other hand, the organisation also needs to ensure that tacit knowledge does not leave the boundaries of the organisation, leading to a loss of competitive advantage based on discretion.

Nevertheless, knowledge requirements are not only university-specific, but also can reflect cross-cultural differences in their nature (Howell and Annansingh, 2013). These cross-cultural differences are especially visible in the social media use in different cultures, which emerged in the recent years. With this in mind, this research aims to assess the Tacit Knowledge Capacity (TKC) of faculty members in Germany and North Cyprus as well as to determine the role of cultural context and its influence on the TKC of the profession of academic work. A comparison based on both the respective organisations and countries will contribute to the literature on tacit knowledge sharing in different organisational cultures (Suppiah and Sandhu, 2011).

2. Literature review

Davenport (1994) perceived KM as a process to capture, distribute and use knowledge effectively. For effective KM, both tacit and explicit forms of knowledge are relevant, although tacit knowledge is considered as difficult to explain as it takes place on an individual’s cognitive level (Kaya and Sagsan, 2015; Erkut, 2016a). To be more precise, “tacit knowledge is deeply rooted in actions, procedures, routines, commitments, ideals, values and emotions” (Nonaka et al, 2000, p.7) and cannot be observed directly. In an economic context, the competition is observed on the level of artefacts that are known to the market, but these only reflect the codified, processed and transformed forms of tacit knowledge that are only made available with the entrepreneurial input of the initiator(s) based on imagination and leadership (Witt, 1998; Erkut, 2016a). Even though the authors refer to imaginations as an entrepreneurial input, the same logic also applies for universities, since their knowledge bases are individuals and processes (Chugh, 2013). The inputs of scientists have an economic processed and transformed forms of tacit knowledge that are only made available with the entrepreneurial input of the initiator(s) based on imagination and leadership (Witt, 1998; Erkut, 2016a). Even though the authors refer to imaginations as an entrepreneurial input, the same logic also applies for universities, since their knowledge bases are individuals and processes (Chugh, 2013). The inputs of scientists have an economic value too; this can be reflected in the third party funded projects they realise, the incentives they receive for a discovery, the ranking results which influence their reputation and market value, and also their collaborative projects with an added value to the society, firms, or individuals. These are all based on the inputs of scientists, where they create knowledge in the same sense as the Hayekian entrepreneur who searches, experiments and finally discovers new knowledge by means of his actions but not of his plans (Ebner, 2005). In order to encourage and accelerate these processes leading to the discovery of new scientific knowledge, universities have potential for both the transfer and the accumulation of knowledge, and they can make use of KM tools to support both of the transfer and the accumulation of tacit knowledge (Martinez-Fernandez and Sharpe, 2008).

2.1 Tacit Knowledge Transfer

Tacit knowledge is hard to transfer because it is very subjective and its procession does not follow a logical manner (Iskanius and Pohjola, 2016). Sensory impulses or sensations are processed in human cortex by means of rules and routines, which emerge in form of hierarchical networks characterised as memory, and shaping the perception (Hayek, 1952; Butos, 2003; Fuster, 2011). Once individual-tacit knowledge is generated, its
transfer is possible through the capabilities of an individual, as described above in terms of the so called entrepreneurial input in the broader sense of Witt (1998) and Ebner (2005). Scientific knowledge and its generation involves the presumption that every scientist has an advantage that is associated with his personal, subjective, tacit knowledge that he can utilise to create an added value to the economy. It is the scientific knowledge that brings a civilisation forward (Ebner, 2005) by gradually changing the economy and the institutional setup. Nevertheless, until it comes to the observation of a certain scientific discovery as an artefact (Erkut, 2016a), it has to be communicated or transferred from the mind of the scientist to the rest of the world. At this point, social media can serve as a medium for enabling and accelerating this transfer. Hence, tacit knowledge transfer (TKT) can be triggered by the use of information and communication technologies (ICT) (Hildrum, 2009; Lopez-Nicolas and Soto-Acosta, 2010). Recent findings point out to the empirical observation that technology alone is not the only relevant factor, since human and social factors are considered to be the most important aspects (Kaya and Sagsan, 2016; Panahi et al, 2016). Furthermore, whether tacit knowledge will be transferred into explicit knowledge depends on the “culture and organisational structure” in universities (Karnani, 2013, p. 237). Social networks, mutual trust and tacit knowledge sharing channels such as document management and expert systems are all associated with TKT (Yang, 2014).

Universities have an “implicit knowledge sharing culture” (Fullwood et al, 2013, p. 130) where the perceived advantages of knowledge sharing are reputation, reward possibilities and networking (Stenius et al, 2016). The transformation from tacit to explicit knowledge in universities is based on shared knowledge in meetings, on documented knowledge that is perceived by other individuals through reading (Bassi, 1997 and Martensson, 2000), or the use of social media, where the latter is considered as complementary rather than a substitute to the former two (Panahi et al, 2016). Recent studies have shown the lubricant characteristics of social media, enabling knowledge transfer and reducing ambiguities resulting from knowledge stickiness that can be caused by weak interpersonal relationships or sheer ignorance (Leonardi and Meyer, 2015).

2.2 Tacit Knowledge Accumulation

Certainly, the generation of tacit knowledge is associated with the perception of objectively available information in a system (a notion corresponding to the pre-step of knowledge generation, called the nano dimension by Erkut, 2016a) and how information is processed in human cortex to generate new knowledge. Information can be tacit knowledge generated by others, e.g. other members of an organisation. As pointed out by Ebner (2005), the generation of new scientific knowledge in the Hayekian-evolutionary perspective depends on both luck and systematic efforts for research, where a new idea does not fall from the sky but is a combination of different factors based on the available subjective knowledge. Hence, the individual needs to acquire and accumulate tacit knowledge in order to continue his systematic efforts for search and discovery of the unknown. This process of accumulation necessarily involves different sorts of contact of the individual with his external environment, for example with other members of the same organisation. If there is no trust between the members, or no social structure keeping them together, such as a common cognitive interpretation of the conception of their research, and the network giving them a common identity, the accumulation cannot occur since the individual cannot receive and process tacit knowledge from his environment.

Hence, tacit knowledge accumulation (TKA) depends on an organisation’s social networks and the level of trust among members of the organisation (Smedlund, 2008). The ability to accumulate tacit knowledge in an organisational setting consists of three components (Yang, 2014): establishing an external knowledge alliance, recognising tacit knowledge and coding that tacit knowledge. These processes consist of both transferring external and converting internal tacit knowledge (Yang 2014). Aside from the organisational setting, the role of mutual trust enables better interaction for TKA if a suitable space such as social media is provided (Panahi et al, 2016). This combines both aspects of socialisation and dialogue that are necessary for TKA (Nonaka et al, 2000; Souoto, 2015). Therefore, social media is a lubricant not only for TKT but also for TKA.

2.3 Cognitive Dynamics of Tacit Knowledge Capacity

Based on Hayek (1952), Butos (2003) and Fuster (2011), an evolutionary economic framework by Erkut (2016a) focuses on how new knowledge is generated and in turn shaping markets. Within this framework, the starting point of the model is the perceptions (nano dimension) – any experience an individual has is a sensation in an ever evolving cerebral cortex (Fuster, 2011), and as a result of the interactions of hierarchical networks in the cerebral cortex, the individual classifies that certain experience according to his or her own categorization by
means of a pattern recognition based on similar past experiences. This is the starting point of the generation of new knowledge – a point which precedes the stage of the introduction of the novelty to the economy. In the micro dimension, new knowledge (novelties, new rules, new products, new technologies, new ideas and so on) is generated as a result, and in the meso dimension it is then transferred with the capabilities of that individual to new forms. This codification process in turn shapes the environment as an artefact in the macro dimension, which is an object made intentionally for a certain purpose (Crilly, 2010). The process is cyclical; hence, it does not stop, but continues to evolve according to the same pattern – a concept defined as the perception/action cycle of an individual (Fuster, 2011). The simplest form of this cycle is a conversation between two individuals, where each individual needs to understand what the other individual says, then he has to think of its meaning, and formulate sentences for the continuation of a meaningful conversation.

This conceptual model can be useful for understanding the knowledge processes in which lecturers are involved. According to this scheme, social media use can have two effects: First, it can be the place where the lecturer has a new experience – meaning his or her access to the ideas of the others which are new to him or her. The lecturer perceives these ideas and interprets them in his or her own cognitive framework, based on the own, partial, subjective, incomplete knowledge of past experiences that are similar in their nature. These experiences can be related to his research or education. At this point, the objectively available information that he perceives turns into the subjectively generated knowledge. Furthermore, after this categorization of the perceived idea within his own cognitive framework, he can codify the new knowledge with his capabilities. This is the second effect of the social media use: In order to transfer the newly generated knowledge to his environment, the individual shapes his environment, which has shaped his perceptions resulting in the generation of new knowledge, and through that way entering into a perception-action cycle. In this context, the evolving environment of the lecturer is both the source and the outcome of the knowledge process – though it is never “available” in its objective form, and always appears in the subjective perception of an individual. In other words, how a lecturer perceives his environment and processes it to generate new knowledge may not correspond to the objective form of the environment itself; in fact, the differentiation between information and knowledge is capturing this idea (Hayek, 1948): Information objectively available in a system is perceived by individuals, processed subjectively and then turns into subjective, tacit knowledge. In terms of Rizzello and Spada (2013), this differentiation is important to understand market dynamics, and accelerating this process can be done by the use of social media in a strategic way. The target of this acceleration process can be enhancing the organisational knowledge basis in order to keep the strategic advantage of the organisation (Bharati et al, 2015). As put forward by Gao et al (2008), the organisational context has the focus of enabling such acceleration processes for knowledge flows, where turning the dispersed bits and pieces of knowledge to a whole within a particular organisation is an objective. In order to achieve this objective, a strategic approach to social media KM is necessary.

2.4 Social Media Knowledge Management

Four factors are accepted to be relevant for enhancing KM and sharing in the university context. In addition to organisational and individual factors, technological and communicational factors are also considered to be relevant. Openness in communication, trust, organisational rewards and culture, and the system quality of KM are empirically observed concepts that associate KM to knowledge sharing, since their effective use can contribute to research collaboration via knowledge sharing, implying creativity in research (Nya-Ling Tan, 2016). It appears that these factors are not restricted to creativity in research. The implementation of social media in lectures aimed at beginners can create interaction between the lecturer and students that enhance the early stages of the learning experience where students tend to remain passive participants (Leung et al, 2015). Although the research of Leung et al (2015) is restricted to the success of a Facebook-based tool, it can be adapted to include other social media tools as well.

Zhang et al (2015) mentioned that research studies related to social media (SM) and KM are increasing. The authors further indicated that SM and KM have shifted from the technological aspect towards management topics. Kaplan and Michael (2010) indicated that SM could improve the knowledge sharing process. Leonardi (2014) further combined the aspects of SM, knowledge sharing and innovation in the framework of communication visibility to conclude that SM also eases the improvement of meta-knowledge of third parties, i.e. “knowledge of who knows what and who knows whom” (Leonardi, 2014, p. 797), which is relevant for avoiding work duplication and developing more innovative ideas. These changes are contingent to the behavioural characteristics of the relevant actors at a cognitive level. Innovation is also an important factor and can be a competitive advantage for organisations. There will be a positive impact on innovation if there is
a creative environment and organisational learning (Nonaka et al, 2000; Jiang et al, 2012; Erkut, 2016b). In the same manner, Sigala and Chalkiti (2015) emphasised the importance of shifting from individual use to organisational use of social networks in improving the creativity of employees: “The social media enable people to aggregate, share, store and synthesise knowledge from various sources for the creation of new meta-knowledge” (Sigala and Chalkiti, 2015, p.45). It can be argued that the research on SM and knowledge sharing primarily focuses on the advantages of SM, which could neglect tensions that may arise from SM, such as privacy concerns (Gibbs et al, 2013; Sarigianni et al, 2016; Kaya and Erkut, 2017). Since privacy concerns are not restricted to the university context (Sarigianni et al, 2016), the market has created SM alternatives to Facebook that are more careful regarding user privacy. For example, a popular application that is heavily used among students is Snapchat. The use of Snapchat in the university context has emerged from the USA, where examples show both student engagement and the use of Snapchat for research purposes (Joly, 2015). Therefore, the ongoing developments in SM applications could be used for more employee creativity in both research and teaching.

2.5 Organisational Aspects

Contingency on the level of management goes back to the management literature of 1950s (Baraz and Sakar, 2011). It states that there is no single way of efficient leadership, but this is rather contingent on the environmental factors an organisation faces. Since then, the focus of organisational structures shifted towards more flexibility allowing the organisation to act contingently towards different situations it faces upon the interactions with its environment (Erkut, 2016b). Flexible and change adaptive organisational cultures provide a competitive advantage, mostly in response to their KM (Sigala and Chalkiti, 2015). On the other hand, the tacit dimension of knowledge cannot be transferred easily as “the tacit knowledge concept is very difficult to explain as well the fact that it takes place at the abstract level of the mind” (Kaya and Sagsan, 2015, p. 140). This could create a dilemma as to whether to make the knowledge explicit and transfer it via social networks or to withhold it as a strategic advantage. In their empirical work, Gibbs et al (2013) claimed that knowledge is used in terms of both openness (using SM to share knowledge with co-workers) and closeness (strategic affordances motivating employees to conceal knowledge). In addition to privacy concerns as mentioned previously, closeness is also justified as a way to avoid interpersonal conflicts, to avoid weakening employee morale in crisis situations, to prevent others from stealing original ideas and as an outcome of the time constraint, which is an impediment to document knowledge in the absence of incentives supporting this process (Gibbs et al, 2013).

Since these factors are subjective in their nature, it is necessary to consider the cultural aspects. Yang (2014) distinguishes between the core values of the organisation, behavioural standards (i.e. how the core values are perceived and adopted by the employees) and enterprise cohesion (i.e. employee attitude and satisfaction, coordination and dependency of the organisation). The organisational culture cannot be isolated from the country’s culture and values, pointing out to the path-dependency (Khan and Khan, 2015; Erkut and Kaya, 2017). Members of a society obey different rules for different reasons and they follow the rules instinctively because they are part of their common cultural tradition (Hayek, 1973, p. 45), where the rules are either formal or informal in their nature.

From the KM perspective, it is therefore the path-dependency in the country’s culture, history and norms, with which an organisation encourages or discourages its members to share knowledge. Khan and Khan (2015) describe values embedded in a nation’s culture such as individualism, masculinity, power distance and uncertainty avoidance as relevant factors influencing the KM culture within an organisation. This issue is associated with the openness of the members to adopt innovation, since this perspective involves how creative and innovative activities are carried out. Creativity (Alwis and Hartmann, 2008), attending seminars, the leadership’s openness (Mellor, 2011), and being alert towards changing conditions e.g. new research results (Alguezaui and Filleri, 2010) are factors that contribute positively to the Speed of Adoption of Innovation. Developed in 1970s, the concepts of mechanical versus organic organisational structures (Baraz and Sakar, 2011) are still relevant in the context of the Speed of Adoption of Innovation. Organic organisation is related to a quickly changing environment and the organisation’s capability to keep pace with it, whereas a mechanistic organisation is more suitable for sectors with low competition and a relatively more stable environment (Baraz and Sakar, 2011; Erkut, 2016b). In today’s perspective, these concepts relate to the fluidity and stability dynamics of markets, which are captured with the concept of market plasticity (Nenonen et al., 2014). Universities as knowledge hubs are ideally very high in taking new forms, but low in retaining these forms, indicating the ever-changing knowledge environment and the ability of university members to keep
pace with this environment through generating new knowledge and implementing it in research and teaching activities. Seniority of the management and how they perceive KM is another perspective that is associated with the cultural dimension of the organisation. Tenure of the employee (Lee et al, 2011), obligations and empowerment (Lin and Lo, 2015) and ambiguity tolerance of the employees (Sanz-Valle et al, 2015) are factors affecting the Seniority of Employees and their KM.

3. Research methods

Tacit Knowledge Capacity (TKC) includes TKT and TKA as stated above. Knowledge transfer describes the transition from tacit to explicit knowledge (Kaya and Sagsan, 2015) and knowledge accumulation is used for the transition from explicit to tacit knowledge in terms of learning by doing (Nonaka et al, 2000). In order to capture the effects of SM use described in the literature review, quantitative methodology was used in this study, where the study population consisted of lecturers from two universities in Germany and North Cyprus. The quantitative methods consist of conducting a questionnaire and analysing the results using a median comparison and calculating correlations as well as conducting regression analyses.

A questionnaire was prepared based on the literature review and the conceptual model described in the literature review, which was conducted in both institutions in February-March 2016. The survey in Germany was conducted in German, in North Cyprus it was conducted in Turkish, where the translations were double-checked by three native speakers of each language in order to make sure that the questions were understood in the same way in both groups. 17 lecturers from Near East University (NEU) in Nicosia, Northern Cyprus and 21 lecturers from Technische Universität Dresden (TUD) in Dresden, Germany participated in the survey. There are 2200 students and 20 chairs in NEU; 2800 students and 23 chairs in TUD, so that the participation roughly corresponds to almost one lecturer from each chair in both universities. Internal consistency of the survey was checked with Cronbach’s alpha, which delivered positive results implying that the internal consistency of the survey was present. In the second step, regression analyses were conducted based on correlation analyses to explain the relationship of TKC with a group of influence factors.

**Figure 1:** The Research Model

Source: Own illustration based on Kaya and Sagsan (2015)

**Problem statement:** In spite of the popularity of SM, the impact of SM on KM has not been researched in detail. In addition, TKC may show differences according to culture in countries where there is also less attention on the topic of KM and culture. In response to this gap in the literature, the authors suggest the following research question:

**How is the TKC of lecturers being influenced by SM?**

Sub Research Questions;
- Do German and Cypriot lecturers differ in terms of their TKC?
- How do the lecturers transfer tacit knowledge by using SM?
- How do the lecturers accumulate tacit knowledge by using SM?
Based on the literature review it is argued that the below propositions could be designated under the following 5 titles (Kaya and Sagsan, 2015, p. 136):

“Hypothesis 1: The Tacit Knowledge Capacity is being positively influenced by Seniority of the Employees.
Hypothesis 2: The Tacit Knowledge Capacity is being positively influenced by the Speed of Adoption of Innovation.
Hypothesis 3: The Tacit Knowledge Capacity is being positively influenced by the Communication Frequency.
Hypothesis 4: The Tacit Knowledge Capacity is being positively influenced by Media Retrieval.
Hypothesis 5: The Tacit Knowledge Capacity is being positively influenced by the Medium of Communication.”

Based on the survey results, the authors chose the method of study to be a two-step approach, where they identified the similarities and differences of lecturers based on their country regarding the factors of TKC. Median test for two independent samples can be utilized for this purpose, which is a non-parametric test suitable for two independent and unbalanced samples, based on Likert scales (Struwig and Stead, 2001). The test evaluates whether the medians of the answers differ between the two samples. The second step of the method corresponds to regression analysis. Two regression analyses will be conducted using TKA and TKT as dependent variables and the following as independent variables: Country dummies for the Medium of Communication (landline/mobile/e-mail/physical face to face/online face to face/WhatsApp/Viber/social networks); country dummies for the frequency of device usage (do not use/rarely use/neutral/high usage for mobile/tablet/laptop/desktop); communication frequency (Facebook, Twitter, LinkedIn, Instagram, Snapchat, Google+, YouTube, e-mail); Speed of Adoption of Innovation.

4. Analysis and Discussion

The first step was identifying the similarities and differences between the TKC of lecturers in the two countries by means of a median test for two independent samples. It was determined that the use of landlines, social networks and tablets was statistically different in both groups. Furthermore, other aspects that were different between the two groups were the accessibility of knowledge and whether faculty members were given enough responsibility.

Non-parametric correlations were calculated, which were less than 70% among the independent variables. Based on the correlation analysis, TKA was positive correlated with the Speed of Adoption of Innovation and Medium of Communication at a .01 significance level, and negative correlated with the Communication Frequency at a .01 significance level. TKT was positive correlated with SAI and Media Retrieval at a .01 significance level. Both models were significant at a .05 significance level (ANOVA). R squared for TKA was .408 and for TKT it was .475. The multiple linear regression results are given in Table 1 below:

<table>
<thead>
<tr>
<th>Models</th>
<th>Dependent</th>
<th>Independent</th>
<th>Standardized Beta Coefficient</th>
</tr>
</thead>
<tbody>
<tr>
<td>Model 1</td>
<td>TKA</td>
<td>Medium of Communication (NEU)</td>
<td>.413</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Medium of Communication (TUD)</td>
<td>1.214</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Communication Frequency (NEU)</td>
<td>.276</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Communication Frequency (TUD)</td>
<td>-.687**</td>
</tr>
<tr>
<td></td>
<td></td>
<td>SAI</td>
<td>.435***</td>
</tr>
<tr>
<td>Model 2</td>
<td>TKT</td>
<td>Media Retrieval (NEU)</td>
<td>.419</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Media Retrieval (TUD)</td>
<td>2.051**</td>
</tr>
<tr>
<td></td>
<td></td>
<td>SAI</td>
<td>.609***</td>
</tr>
</tbody>
</table>

**p<.05, ***p<.01
Source: Own calculation of the authors using the statistical software programme SPSS

Model 1
The effect of TKC was analysed to see if there is a relationship between the dependent variable (TKA) and the independent variables. The results show that the TKA will be affected by .435 units when the SAI is upgraded by 1 unit. Also, the TKA would be affected by -.687 units when the Communication Frequency is upgraded by one unit, although this is only significant for the Dresden sub-sample.
Model 2
The effect of TKC was analysed to determine if there is a relationship between the dependent variable (TKT) and the independent variables. It was revealed that TKT would be affected by .609 when the SAI is upgraded by one unit. The TKT would be affected by 2.051 when the Media Retrieval is upgraded by one unit, although this is only true (and significant) for the Dresden sub-sample.

SM Use of Lecturers
Facebook is the most used social networking site (SNS) amongst lecturers as the survey revealed that 63.4% of them visited it at least once a day. YouTube is the second most used SNS with 48.8% daily use; this platform can be used for providing educational videos in order to support students’ learning. 63.4% of lecturers never used LinkedIn, which was surprising as that network is important as a career tool to increase professional networking. 73.2% of them never used Instagram while 95.1% had never used Snapchat. Especially the latter observation can be turned into an advantage once it is introduced to the lecturers in a strategic vision: A recent report indicates that college students feel more secure while using Snapchat (Utz, 2015) due to privacy concerns. In addition, it is one of the most popular SNS amongst university students (July, 2015). As it can be seen from these results, SNSs are not completely unknown to the lecturers; the need is a strategic approach towards the innovations in SM to ensure the tacit knowledge capability on the organisational level keeps pace with the technological change. As stated by Shelton (2017), new technological tools for professional purposes 

Differences and Similarities of TKC between Lecturers
The landline use of lectures in Germany is higher than lecturers in Cyprus. The authors argue that this is due to increased mobile ownership in North Cyprus. There is currently 203% mobile ownership in North Cyprus compared with 132% in Germany (Balcioğlu et al, 2016; Statista, 2016). The statistics indicate that Cypriots use mobiles considerably more and therefore it is understandable why their landline use is lower. When the use of social networks by lecturers was examined, it was found that Cypriot lecturers use them more than their German colleagues do. Cyprus has a high context society where people have closer relationships with their family members, friends and colleagues. On the other hand, Germany has a low context society where people have weaker relationships with their colleagues (Hall and Hall, 1990). The authors believe that greater social network use is due to the cultural behaviour of Cypriots.

“I can access knowledge I look for easier” scored higher among German lecturers. Employee accessibility to knowledge affects their creativity and therefore positively influences innovation (Sigala and Chalkiti, 2015). This indicates that knowledge needs to be made more accessible, which will improve the TKC of lecturers in North Cyprus. Mediums for exchange of knowledge need to be provided and SM can be such a medium. “Secret” Facebook groups amongst lecturers could be effective to increase knowledge transfer and accumulation within the department. In spite of previous research that indicated that seniority affects the TKC of physicians (Kaya and Sagsan, 2015), the research findings indicated that the seniority of lecturers did not have any impact on their tacit knowledge accumulation and tacit knowledge transfer, hence the authors rejected Hypothesis 1. This is understandable as the nature of knowledge constantly changes in competitive and fast moving environments, which means lecturers need to adapt to changes that are more related to their skills than their age. Recent empirical evidence by Aborujilah et al (2017) highlight hat senior lecturers are more keen than junior lecturers in the issue of receiving feedback on their courses from their students via social networks. In addition, the importance of life-long learning has also been highlighted by the authorities (Stock, 2013).

Regression Models 1 and 2 highlighted that Speed of Adoption of Innovation has a positive effect on TKC, which supports Hypothesis 2. Flexible and change-adaptive organisational cultures provide a competitive advantage, mostly in response to their KM (Sigala and Chalkiti, 2015). Therefore, removing hierarchical barriers will improve the KM process and the organisational effectiveness (Yih-Tong Sun and Scott, 2005; Erkut, 2016b). Especially decentralizing the knowledge processes by giving more initiative to individuals in flexible organisational structures (Erkut, 2016b) is an important notion to overcome the difficulties that arise from hierarchical barriers preventing individuals to generate new knowledge in a free and efficient way.
Nevertheless, this freedom has to be accompanied by incentives and the feeling of responsibility towards the organisation in order to achieve the desired objective of knowledge generation.

The regression models did not highlight any significant relationship between the Medium of Communication and TKC of lecturers; hence the authors rejected Hypothesis 5 and focused on the reasons of this finding. A closer look at the results delivers the following details: Facebook is the most used social networking site (SNS) amongst lecturers where 63.4% of them use it at least once a day. YouTube is the second most used SNS with 48.8% daily use; this platform can be used for providing educational videos. This opportunity seems to be promising, yet undiscovered in our sample; “YouTube can also be a channel for supporting education in which teachers have the opportunity to either discover supportive videos or upload videos themselves” (Kaya and Bicen, 2016, p. 376). Instagram can be used for providing module/class information, as visualization is an effective medium for education (Crnovrsanin et al, 2014). In addition, a recent report indicates that college students feel more secure while using Snapchat (Utz, 2015) and it is one of the most popular SNS amongst university students (Joly, 2015). When students’ SNS use is considered, it is recommended that universities invest in SM platforms and encourage lecturers to use SM, as it will also increase their creativity (Sigala and Chalkiti, 2015). Improving creativity will improve innovation and therefore the KM process and TKA accordingly (Donate and de Pablo, 2015). There will be a greater chance of improving practices as more tacit knowledge will be accumulated. Thus, effective SNS use by lecturers can increase knowledge transfer and universities should encourage effective use of social networks.

Regression Model 1 furthermore highlights that Communication Frequency affects the TKA of lecturers negatively, although a significant result was only found for the Dresden sub-sample, contradicting Hypothesis 3. The authors explain this effect by possible distractions disturbing the knowledge processes of lecturers, once they are focusing on using SM for academic purposes. Therefore, it is advised for the lecturers to use applications that will lock other mobile phone features (communication, browsing etc.) while researching, which will increase the accumulation of tacit knowledge by reducing distractions. One observation based on anecdotic evidence also supports this fact; many of the lecturers from Germany stated that they can work better during their train trips than at their offices, since the distraction is at a minimum due to the absence of internet in many of Germany’s local trains, which is nevertheless a changing issue.

In addition, Regression Model 2 indicates that Media Retrieval influences TKT positively, confirming Hypothesis 4, although the significance was also here only for the Dresden sub-sample. It could be stated that, as the media becomes more accessible, the transfer of knowledge will be increased accordingly. This is apparently not the case for the Nicosia sub-sample of lecturers. Tablet use by Cypriot lecturers was higher than their German colleagues. The use of new technological devices should be encouraged by institutions to increase TKT.

5. Concluding Remarks and Further Research

To conclude, the research findings highlight that universities should invest in SM platforms to increase the tacit knowledge accumulation of lecturers. Since the boundaries between the private and the professional are not very strict in the age of SM use, it is clear that investing in the web sites of the universities is not enough, since the knowledge processes occur mainly in or via SM. At this point, universities cannot intervene in the knowledge processes but rather shape these in a strategic manner: Not only the use of social networks such as Facebook, YouTube, Instagram and Snapchat is necessary for this process, but rather their effective use, especially with respect to the knowledge alliances of university easing the accumulation process of tacit knowledge. SM is a constantly changing field. Therefore, current trends need to be considered and the SM use of lecturers can be modified accordingly. As students have a high tendency to use SM, the use of the same communication channels will also be effective for knowledge transfer. Furthermore, removing hierarchical barriers and introducing incentives to use technological devices will also increase TKC and the creativity of lecturers, which will also boost the innovation capacity of institutions.

Clearly, knowledge processes in a knowledge intensive organisation cannot be planned centrally (Erkut, 2016b); however, a strategic direction can be given to the organisation, from which knowledge generation processes can emerge. How this can be done depends on the organisational culture and national values, but a point that can be mentioned is empowering the members of an organisation for taking more initiative and looking for ways to generate new knowledge by also keeping in mind that they are responsible for the
direction an organisation takes (Erkut, 2016b). As it is clear from the research on the contingency theory of management, “there is no perfect model of organisation which fits in every situation” (Erkut, 2016b, p. 117).

The organisational culture and its interaction with the national values is rather a notion which cannot be imitated easily, since the way the organisational culture emerges is very much dependent on the way it is operationalised as a business conception (Erkut and Kaya, 2017). Therefore, how the members of an organisation will be empowered and how the flexible structures towards both formulating a strategic vision of innovation and adapting the innovation will be arranged are both contingent issues. The latter issue was captured by the significant relationship between the speed of adoption of innovation and the tacit knowledge capacity in both regression models. This study mainly focused on the possible influence factors of SM use on tacit knowledge capacity, which can be described as the stylized facts helping decision makers in universities to adjust their knowledge processes in order to keep pace with the technology.

What has to be kept in mind is that, how lecturers transfer and accumulate tacit knowledge, i.e. their models of the (scientific world), “cannot be isomorphic (i.e. 1-1) with an external world” (Lehmann-Waffenscheidt and Sandri, 2007, p. 20). In line with Lehmann-Waffenscheidt and Sandri (2007) authors therefore emphasize that knowledge in this setup has to be observed from a constructivist rather than the objectivist perspective, indicating the properties of particularity and possibility, and allowing for “heterogeneity and coexistence of mental models” (p. 23). This implies that the use of SM can accelerate the knowledge intensive processes of higher education institutions, but nevertheless also has to be utilized in a strategic manner in order to give the members of the particular institution a common cognitive framework. This remains as a challenge for the formulation of a strategic innovation vision.

Like many other quantitative studies, the research of the authors is not without any limitations. Although 85% of the target population at NEU and 84% at TUD were reached by this study, the number of lecturers involved in the primary research that was conducted is relatively small. Furthermore, there can be a self-selection effect in terms of participants, since it is more likely that those lecturers not familiar with SM may have chosen not to participate at this survey. Nevertheless, these limitations can be overcome by further studies. It will be more effective to develop and undertake this research for larger populations and different occupations that are also knowledge intensive. Identifying stylized facts from the tacit knowledge use of knowledge intensive professions can be set as a target to focus on ways to modify organisational structures to keep pace with the technological change especially for making use of the SM as a lubricant in the knowledge processes of organisations. This target can only be achieved with further investigation and also by implementations of the results in the strategic policies of knowledge intensive organisations.

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References


Intellectual Capital and BI-tools in Private Healthcare Value Creation

Milla Ratia
Laboratory of Industrial and Information Management
Tampere University of Technology, Finland
milla.ratia@student.tut.fi

Abstract: The demand for data-driven decision making in the healthcare sector has increased, not only on the clinical side, but also from the managerial perspective; this is especially true in the private healthcare sector. Utilisation of internal and external data requires certain capabilities, such as intellectual capital (IC), as different data sources (structural capital) and organisational competences (human capital) can become organisational value. We study the utilisation of business intelligence (BI) tools and IC dimensions in creating value in the Finnish private healthcare sector.

IC components and a modified value creation capabilities model are used as a framework for considering data utilisation and BI tools’ role in value creation. Our study includes private healthcare organisations in Finland and management and BI technology consulting representatives. Thematic interviews of key personnel responsible for BI were conducted to elucidate the value creation capabilities, IC components and BI tool utilisation in the Finnish private healthcare industry.

Data-driven decision making is currently one of the most discussed topics in private healthcare sector organisations. By analysing the current data source utilisation and organisational competences in data utilisation, we gain a better understanding of IC and BI tool-enabled value creation in private healthcare organisations.

The study’s outcomes will provide valuable information and a deep understanding concerning the influence of BI tools and IC dimensions on value creation in private health care in Finland. In addition, it will provide insight into future-oriented value creation factors that can enable new business concepts for private healthcare companies. Advanced capability of data utilisation will increase the value creation ability in private healthcare sector companies. However, in addition to the technology and data, human capital or capability of BI tool utilisation and data-driven decision making are crucial.

Keywords: Private healthcare, business intelligence, intellectual capital, value creation, external data sources

1. Introduction

The amount of data in the healthcare that are being generated, captured, processed and analysed is expanding significantly. It has been widely recognised that not only are the amounts of clinical data growing, but operative business data are also being used to support organisational decision making (Raghupathi, 2010; Raghupathi and Raghupathi, 2014; Spruit, Vroon and Batenburg, 2014; Grierson, Corney and Hathcher, 2015). The same demand has been identified in the private healthcare, where organisations are seeking to enhance their understanding of business practices and related organisational data, as well as their operational environment, to enable better performance via enhanced decision making (Demirkan, 2013; Ratia and Myllärniemi, 2017; Ratia, et al., 2017).

In private health care, the interest in efficient data utilisation and the business intelligence (BI) tools enabling exploration and utilisation of organisational data has increased (Elbashir, et al., 2013). In addition, there has been a growing interest in identifying necessary data sources, not only for supporting organisational decision making but also combining external data sources, open data among others, with the organisational data, and creating the potential for new business opportunities, and thus, value (Ratia and Myllärniemi, 2017). In contrast, utilisation of both internal and external data requires certain capabilities, such as intellectual capital (IC) dimensions, namely data (structural capital) and competences (human capital), to succeed. The significance of data utilisation has been growing and creating the need to transform the data-related IC dimensions into organisational value; this has brought up a managerial approach of IC dimensions, related to
human and structural capital, on how to utilise IC in the management of the organisation (Dumay and Garanina, 2013; Lerro, Linzalone and Schiuma, 2014).

The paper aims to examine the role of IC dimensions, and more specifically, structural (data) and human capital (competences), as well as utilisation of BI tools in data-driven value creation in the private healthcare sector in Finland. In this paper, various data sources and BI tools are considered as a part of structural capital, and BI tool utilisation and competence are viewed as human capital dimensions. This study brings together qualitative empirical data on competences available for BI tool use and data source utilisation, combined with a theoretical framework, for exploring the potential of external data sources' value-creating rationale.

The applicable selection of BI tools and capabilities is an important aspect in the field of private healthcare, but there are not many previous studies that have examined this issue (Suomi and Tähkäpää, 2002; Wullianallur and Viju, 2014; Ratia and Myllärniemi, 2017). In addition, the role of IC dimensions in the value creation potential in the private healthcare sector remains unclear. By exploring the IC dimensions and BI utilisation in the context of private healthcare, the research brings novel value for private healthcare sector companies, as well as consulting organisations providing competence, for the value-creation potential. The practical outcome of this research will provide valuable information and a deep understanding concerning the role of BI tool utilisation competences and data sources in private healthcare in Finland. In addition, it will provide insights into the value creation potential that those IC dimensions can create for private healthcare companies.

In the second section of the paper, the aim is to show a conceptual basis for IC and BI, as well as a modified model of value creation capabilities (Mölör, Rajala and Svahn, 2005; Ratia and Myllärniemi, 2017). Section 3 presents the empirical setting, introducing the methodology and empirical material. Section 4 shows the results of data-driven value creation in the Finnish private healthcare sector. Finally, in section 5, the conclusions and discussion complete the paper.

2. BI tools creating value by IC in the private healthcare

2.1 The concept of IC

The connection between organisational knowledge and intellectual capital has been considered in several previous studies. The first one to introduce IC was Galbarait (1969), who considered it a form of knowledge, intellect and brainpower activity to create value utilising knowledge (Galbarait, 1969; Shih, Chang and Lin, 2010). In addition, intellectual capital can be the sum of all the knowledge organisations use to gain a competitive advantage (Nahapiet and Ghoshal, 1998; Youndt, Subramaniam and Snell, 2004; Subramaniam and Youndt, 2005; Wang, Wang and Liang 2014). However, there can still be defined the two different focusses between them. IC can be seen focussing on intangible resources and knowledge management (KM) concerning knowledge-related processes and management activities (Edvinsson and Malone, 1997; Sullivan, 1998; Gold, Malhotra and Segard, 2001; Lee and Choi, 2003; Heisig, 2010; Spender, et al., 2013; Kianto, et al., 2014). The literature has introduced several IC definitions; one of the most typical, which is also used in this research, is dividing the intangible resources into three dimensions – human, structural and relational capital (e.g. Bontis, 2001; Guthrie, 2001; Ling, 2013; Kianto, et al., 2014).

Human capital refers to employee competences or capabilities, such as skills, training, education, experience and professional know-how (Dzinkowski, 2000; Shih, Chang and Lin, 2010; Ling, 2013; Kianto, et al., 2014). Structural capital can be viewed as organisational processes and flows, supply chains, systems and databases (Shih, Chang and Lin, 2010; Kianto, et al., 2014). Relational capital refers to the relationship networks and interactions between all related parties and stakeholders (Roos, Bainbridge and Jacobsen, 2001; Shih, Chang and Lin, 2010; Kianto, et al., 2014). Therefore, normatively, IC can be conceptualised into three separate elements that accumulate and distribute knowledge differently (Subramaniam and Youndt, 2005). In addition, the literature presents people (human capital), systems and procedures (structural capital) as a requirement for everyday organisational activities, along with organisational interactions between internal and external stakeholders (relational capital; Rossi and Magni, 2017). The evolution of IC research has moved from understanding IC's potential in creating and managing a competitive advantage, profit-driven IC and accountingisation, toward a more strategic managerial approach (Petty and Guthrie, 2000; Dumay, 2009; Chiucchi and Dumay, 2015).
The discussion of organisational knowledge and IC also refers to a List of Operational Knowledge Assets (LOKA), which identifies several areas of contribution into organisational data, information and knowledge, namely market capital, human capital, decision effectiveness, organisational capital and innovation and customer capital (Andreu, Green and Stankosky, 2007; Erickson and Rothberg, 2014). The approach clearly illustrates that information and data are a solid part of the discussion. In addition, BI and BI tool utilisation are naturally part of both organisational knowledge and IC discussions (Erickson and Rothberg, 2014). Edvinsson and Sullivan (1996) describe organisational knowledge as knowledge that can be converted into value. This can include knowledge, systems and data processes (Edvinsson and Sullivan, 1996).

2.2 BI and utilisation of external data sources

The notion of BI has several definitions that supplement each other, enabling overall understanding of the BI concept. It can be viewed as a combination of different tools, applications and methods (Turban, et al., 2008). Nykänen, Järvenpää and Teittinen (2016) is separating BI into two main streams: technological and process. In addition, from a broader perspective, BI can include many concepts that are relatively close to each other, such as competitive intelligence, market intelligence, customer intelligence, competitor intelligence, strategic intelligence, technical intelligence and data analytics (Hannula and Pirttimäki, 2003; Lönnqvist and Pirttimäki, 2006; Kimble and Milolidakis, 2015). In addition, BI can be a managerial activity and have a strategic goal in terms of collecting raw data, evaluating the validity and reliability of data, analysing and storing data and sharing the processed information to support the organisational decision makers, thereby affecting the value creation (Gilad and Gilad, 1985; Pirttimäki, 2006; Nykänen, Järvenpää and Teittinen, 2016).

In addition to a process or management approach, in the literature, BI has been described as a selection of techniques, such as statistical methods and data mining, technologies, tools, practices, methodologies and applications, enabling the business data analysis required for a better understanding of the business and market. As a result, it leads to data-driven decision making by providing comprehensive, timely information (Hannula and Pirttimäki, 2003; Chen, Chiang and Storey, 2012; Cörte-Real, Ruivo and Oliveira, 2014; Nykänen, Järvenpää and Teittinen, 2016; Ratia and Myllärniemi, 2017). Simply, BI is business’ ability to utilise the available data and employ it (Kimble and Milolidakis, 2015). To benefit from BI utilisation, organisations need proper tools to enable data analysis. BI tools, such as data warehouses and data mining tools, support the different stages of data-driven decision making as efficiently as possible, simultaneously bringing value to the organisation. Real-time, flawless information access to support decision making is critical, and the amount of information in organisations is growing rapidly, thereby creating challenges for data processing, which requires specific tools to enable knowledge and value creation to the organisation (Hannula and Pirttimäki, 2003; Jinpon, Jaroensutasinee and Jaroensutasinee, 2011; Ratia, et al., 2017). Overall, BI includes people, processes and technology, as well as the knowledge and end product (Hannula and Pirttimäki, 2003; Shollo and Galliers, 2016).

Like BI, KM has multiple definitions; one is that it is a set of practices concerning the creation, development and application of knowledge in terms of organisational performance. Both KM and BI improve the utilisation of available information and knowledge, as well as processing unstructured information, along with tacit knowledge (Wang and Wang, 2008). However, the concepts of BI and KM are not identical. The purpose of BI tools is supporting the decision-making process, whereas KM technologies can be viewed as knowledge and content management for storing, distributing and analysing structured and unstructured information (Herschel and Jones, 2005). Although KM has many different definitions in the literature, one clear aspect can be identified that differentiates it from BI: It contains subjective human knowledge that is not data for objective information (Davenport and Seely, 2006; Wang and Wang, 2008). However, BI and KM are deeply influenced by each other (Wang and Wang 2008).

IC dimensions – more specifically, structural capital, such as data – can be a valuable asset for organisations. In contrast, the value of BI tool utilisation is created by connecting different data types from different sources, allowing businesses to collect, evaluate, analyse, store and share up-to-date data to be used efficiently in decision making. The role of external sources in creating strategic opportunities and new potential sources of revenue has grown significantly (Zahra and George, 2002; Denrell, Fang and Winter, 2003; Foss, Lyngsie and Zahra, 2013). In the context of healthcare, external data can comprise social media posts, including Twitter feeds, blogs, status updates on Facebook and other platforms and webpages; or less patient-specific information, including emergency care data, newsfeeds and articles in medical journals. For example, utilising external data and applying advanced analytics to patient profiles would benefit from proactive care to
preventive care (Raghupathi and Raghupathi, 2014). Consequently, BI utilisation can include both internal and external data sources, where they can be used separately or together, creating new data and information, and thus, value.

2.3 IC creating value in private health care

Data and the ability to connect different data sources can be considered valuable from an organisational point of view, as it enables a data-driven approach. However, the concepts of value and value creation and their importance in the context of business decision making can be considered multilateral. When considering an extended perspective, the concept of value can be described in terms of a trade-off between benefits and sacrifices (Parolini, 1999; Lapiere, 2000; Hugos and Hultzky, 2011; Ojala and Helander, 2014; Ratia and Mylläriemi, 2017). These trade-offs between benefits and sacrifices can be divided into monetary terms, such as productivity and efficient resource utilisation, as well as non-monetary terms, such as competence, market position, social rewards, time, effort and energy (Hagen and Hagsten, 2006; Nordgren, 2009; Mylläriemi and Helander, 2012; Ojala and Helander, 2014). In this research, we mostly focus on data-driven value creation enabled by IC dimensions, more specifically, human and structural capital.

The data-driven approach is strongly related to the discussion of IC value creation. In addition, data and knowledge are crucial drivers for an organisation’s performance and value creation (Hussinki, et al., 2017). In addition, an organisation’s capability to innovate has a close relation to its IC and ability to utilise it (Subramaniam and Youndt, 2005; Pirozzi and Ferulano, 2016). The role of capabilities has been central in the IC discussion, as has the effect of IC on value creation in organisations, although IC is a multilateral topic with no exact definition (Moustaghfir and Schiuma, 2013; Secundo, et al., 2017). Mostly, the literature divides the IC research into two interpretations: the conceptual, passive and categorisable, measurable assets and the dynamic, interpreting IC from a process or capability perspective (Edvinsson and Malone, 1997; Sullivan, 1998; Bontis, 2001; Guthrie, 2001; Kianto, et al., 2014; Pirozzi and Ferulano, 2016). Overall, IC can be defined as a sum of the intangible and knowledge-related resources that organisations can use to create value (Kianto, et al., 2014). Organisational IC consists of immaterial resources, such as human capital, structural capital and relational capital, creating value for the organisation (Kujansivu and Lönnqvist, 2005; Secundo, et al., 2017). Out of these, human capital and structural capital are the focus and basis for value creation in this paper. Moreover, the organisational competence of BI tool utilisation, as well as the utilisation of external data sources and its combination with the organisational data to create value.

Knowledge processes and methods, like BI, should be tightly connected to healthcare organisations’ service provision and value creation (Mylärniemi and Helander, 2012). To clarify the BI tools’ meaning in value creation and the link to IC, we use a network-capability-base framework as the foundation of our analysis, as modified for the private healthcare sector (Möller, Rajala and Svahn, 2005; Ratia and Myllärinemi, 2017). However, the conducted analysis was based on qualitative research, which was supported by the analysis. In addition, it shows how IC dimensions are connected to data-driven value creation and the linkage to utilisation of external data sources and organisational capabilities or competences in BI tool utilisation.

3. Methods

This research was carried out using qualitative research methods and a case study research strategy. The research strategy, multiple case studies performed with qualitative research methods, was chosen for its suitability for studying complex and context-dependent research topics (Yin, 2003). In total, 26 thematic interviews were conducted for the study between January and October 2017. The companies were chosen to represent different sizes of private healthcare organisation, management consulting companies and technology consulting companies operating in Finland to accomplish potentially different viewpoints of data and BI utilisation. The research proceeded by conducting semi-structured thematic interviews, which were time-intensive, face-to-face interviews and Skype interviews, as the interviewees were executives and high-level managers and consultants on a tight schedule. The questions in the thematic interviews related to the connection of different data sources and organisational competence to value creation. The interviews were recorded and transcribed to enable systematic organisation and analysis of the gathered data (McLellan, MacQueen and Neidig, 2003). The qualitative approach provides better explanations and understanding of the research topic, also enabling adjusted questions, and as a result, more information, than if a quantitative study had been conducted (Yeoh and Koronios, 2010; Nykänen, Järvenpää and Teittinen, 2016). The flexible
approach to semi-structured interviews allows information to be gathered effectively and conveniently (Qu and Dumay, 2011).

Private healthcare companies involved in the case study were engaged in business activities in the healthcare, social care and dental care parts of the healthcare industry. The consulting case companies involved in the research were engaged in management consulting and technology consulting. Furthermore, the companies were located all over Finland. In addition, Finnish companies and international companies with offices in Finland were included. To identify the relevant private healthcare and consulting organisations for this research, it was necessary to gather multiple open-source documents about the companies’ backgrounds and analyse whether they would be suitable for the research.

From the private healthcare sector, the interviewees were top managers and directors, representing mostly information and communication technology (ICT) or financial organisational functions; they were selected to be involved in the research based on their area of responsibility for BI in their organisations. Private healthcare companies with a turnover of over 40 million euros per year (as of 2015) were chosen for the study. The list of interviewees, their position in the organisation and their primary areas of responsibility are presented in Table 1.

### Table 1: List of Interviewees, Organisational Positions and Areas of Responsibility

<table>
<thead>
<tr>
<th>Interviewee</th>
<th>Position in the organisation</th>
<th>Area of responsibility</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Director, Information and Communication Technology (ICT)</td>
<td>Head ICT functions</td>
</tr>
<tr>
<td>2</td>
<td>Director, Digital Services</td>
<td>Head of Digitalization</td>
</tr>
<tr>
<td>3</td>
<td>Head of Information Technology (IT)</td>
<td>Head of ICT functions</td>
</tr>
<tr>
<td>4</td>
<td>Development Manager</td>
<td>Responsible for business intelligence (BI) and development</td>
</tr>
<tr>
<td>5</td>
<td>Chief information officer (CIO)</td>
<td>Head of ICT functions</td>
</tr>
<tr>
<td>6</td>
<td>Head of Accounting and Reporting</td>
<td>Head of Controlling and BI</td>
</tr>
<tr>
<td>7</td>
<td>Director, Digitalization</td>
<td>Head of ICT and Digitalization</td>
</tr>
<tr>
<td>8</td>
<td>ICT Manager</td>
<td>Head of ICT</td>
</tr>
<tr>
<td>9</td>
<td>Head of Controlling</td>
<td>Head of Controlling and BI</td>
</tr>
</tbody>
</table>

The interviews were conducted in January–May 2017. Altogether, nine thematic semi-structured interviews were conducted among private healthcare sector companies. The interviews were carried out in a discursive atmosphere, addressing the key themes identified from the literature concerning IC and BI tools. Thus, the interviews included discussion on specific issues, for example, what kinds of data sources are currently being utilised and whether the companies have enough organisational capabilities for BI utilisation.

Seventeen consultants were interviewed for the study. The approach was inductive, with semi-structured, thematic interviews. The interviewees from the consulting industry were management consultants and BI technology consultants; they were selected to be involved in the research based on their area of responsibility in BI-related consulting in their organisations. In total, 52 consultants were contacted via the professional social networking platform LinkedIn. The list of interviewees and their organisational positions and main responsibilities is presented in Table 2.

### Table 2: List of interviewees, Organisational Positions, and Company Types

<table>
<thead>
<tr>
<th>Interviewee</th>
<th>Position in the organisation</th>
<th>Type of consulting</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Director</td>
<td>Technology</td>
</tr>
<tr>
<td>2</td>
<td>Consultant</td>
<td>Technology</td>
</tr>
<tr>
<td>3</td>
<td>Director</td>
<td>Technology</td>
</tr>
<tr>
<td>4</td>
<td>Consultant</td>
<td>Technology</td>
</tr>
<tr>
<td>5</td>
<td>Director</td>
<td>Technology</td>
</tr>
</tbody>
</table>
The interviews were performed in April–October 2017. There were 12 interviews in the field of technology consulting and 5 interviews in management consulting. Altogether, 17 semi-structured thematic interviews were conducted among the consulting companies. The discursive interviews included discussions on issues like whether there were external data sources utilised in the customers’ organisations and customers’ organisations had enough capabilities for BI utilisation.

The interview data were transcribed and classified following the content analysis method, and the data were grouped by their key themes. In section 4.1, we present our results according to the interview themes. In section 4.3, we analyse the results using the modified value creation capabilities framework (Möller, Rajala and Svahn, 2005; Ratia and Myllärniemi, 2017), utilising it to point out the importance of IC in data-driven value creation in private health care.

4. Results and implications

4.1 Utilisation of data in the private healthcare sector

The private healthcare companies participating in this research utilised several data sources in their BI tool(s). Most had several data sources from operational and financial systems to be modelled in one data warehouse model and analysed further using one or several BI tools. In addition, most of the companies used more than one BI tool, from one to four BI tools each, for various – mainly historical – reasons (Ratia and Myllärniemi, 2017). Furthermore, digital channels were mentioned as one of the data sources. The multiple sources of structural capital included structured data being utilised in creating value. Utilisation of both internal and external data sources was considered crucial: As interviewee no. 2 stated, ‘Without a doubt, we have a need to combine various new data sources, not just our own internal operative data, but also external, open-source data, with the intention of doing deeper trend analysis. The aim is not only to serve our internal needs, from a production management point of view, but also to create new data for our customers – both corporations in general and individuals – regarding their personal health’. Thus, structural capital and combining data from both internal and external sources, as well as utilising open data, can be viewed as valuable assets. In addition, structural capital was viewed as a valuable factor for the future: ‘I strongly believe that it is becoming the centre of the business. Advanced data processing and its potential will open new business opportunities that were impossible before’ (interviewee no. 7). In addition, the core business was perceived to be moving more toward data-based business: ‘There will be new data-driven business concepts, around which the whole business will be built up’ (interviewee no. 7).
The second theme was related to the internal and external capabilities of the organisation. Internal and external capabilities and competences for data and BI tool utilisation have a significant role. All eight private healthcare organisations were using external capabilities to some extent. Some companies clearly had internal capabilities, and they were only utilising external capabilities in special cases. As interviewee no. 3 noted, ‘We do the majority ourselves, but in special cases, we use consulting services – I would say about 10% of all the BI work’. Moreover, as another interviewee commented, ‘We are trying to gain internal capabilities, but for deeper things we use consulting’ (interviewee no. 9). However, there were also some organisations that outsourced some BI-related work on purpose: ‘We have internal capabilities to some extent, but we have made a conscious decision to use consultants for some technical issues’ (interviewee no. 4). Nevertheless, most of the companies exhibited a balance between internal and external capabilities, although many interviewees considered that the current internal capabilities were not as strong as they could have been. Some interviewees strongly felt that there must be a certain level of in-house capabilities to secure continuity. A lack of human capital is a relevant problem that is weakening the efficient utilisation of data: ‘I don’t have enough in-house capabilities right now, but such capabilities are on a recruiting list. This is slowing the progress and development of our BI’ (interviewee no. 1). In addition, the creation of internal capabilities, or enhancing human capital, to enable efficient future data processing was considered important: ‘If I think about future recruiting, and hiring more people, then one person is not going to be enough. Capabilities can become our bottleneck in terms of BI’ (interviewee no. 5). Thus, having insufficient internal capabilities is slowing down the development and progress of BI.

4.2 External data utilisation and organisational capabilities as a part of IC

The interviewees from the consulting industry had opinions that meshed with those of private healthcare organisation decision makers, to the effect that external data sources were not being utilised enough. However, the potential was viewed as significant, and most BI tools allow combining internal data with open data or other forms of external data sources: ‘This is going to grow, this is the direction we are heading’ (interviewee no. 7). However, disagreement in the interviewees’ opinions emerged in discussing whether the organisations were ready for utilising external data sources: As interviewee no. 4 argued, ‘Even the internal data sources are not yet being utilised efficiently, not to mention external data sources’. Some of the interviewees had more faith in the monetisation of data: ‘Linking it to the organisational data and process further on – This is actually something you want to pay money for!’ (interviewee no. 16). The utilisation of external data sources is clearly growing; as one interviewee mentioned, ‘No doubt we are going in this direction’ (interviewee no. 12), and another stated, ‘It is being done more and more’ (interviewee no. 9). Nevertheless, although the awareness of possibilities concerning external data utilisation has grown significantly, it seems that it is still in its inception. The overall impression of most consultants was that, although some of the organisations are already doing this successfully, the others are just heading there.

The consultants also shared their opinions concerning capabilities. There were several views on the sufficiency of capabilities. Some of the interviewees strongly felt that there were not enough capabilities to fulfil developing organisations’ needs: ‘They use our services so much, and in such things, there is no way they would have enough capabilities of their own’ (interviewee no. 11). As one interviewee argued, ‘If they had internal competence in BI, they wouldn’t be needing us so much’ (interviewee no. 2). Another approach was that the controlling type of resources was sufficient, but there was a significant lack of resources on the data science and business sides: ‘I can tell you where they lack competence, as we are always asked for data scientists and business strategists’ (interviewee no. 16). In addition, one of the perspectives, especially on the management consulting side, was that the capability discussion is not only about operational capability, but also about the capabilities throughout the organisation, especially concerning the top management and strategic goals. However, it was obvious that the capability discussion is beyond the scope of operational performance; instead, it is part of the management strategy.

The discussion of future BI was strongly directed toward predictive analytics and evidence-based decision making. Historically, BI has been static and backward looking; now and for the future, it is becoming proactive and predicting. In addition, the processing is increasingly transferred from the ICT functions to the end user. In addition, one of the trends is the capacity to conduct predictive analytics. Online analytics enabling reactive interaction could enable evidence-based results in the decision making. Another future trend is collecting and combining external data sources to elucidate how the market functions.
4.3 IC enhancing value creation in the private healthcare sector in Finland

The three levels of value creation identified in the Finnish private healthcare sector are illustrated in Figure 1. IC dimensions, human capital and structural capital play a major role in the value production enabled by BI utilisation. The first level, core value production, requires human capital in efficient service production and delivery of services, as well as in process flexibility and excellence. In addition, structural capital affects performance excellence, operational efficiency and data-driven decision making. This value creation process requires both BI tools and data, as well as the capacity to use them properly.

Figure 1: Data-based value creation (based on Möller, Rajala and Svahn, 2005; Ratia and Myllärinemi, 2017).

The second level is moving toward value-adding value production. In the context of private healthcare, human capital can enhance service excellence and enable the development of new solutions and services. In contrast, structural capital enables enhancing performance and efficient data utilisation. Already, data sources create a potential in terms of value creation. In this research, most of the company representatives thought that the external data sources would turn into a competitive advantage in the near future. As the competition is increasing in the private healthcare sector in Finland, there is also pressure to provide better customer service and enhance customer satisfaction, as well as taking the data value-adding practices further. However, it is clear that IC dimensions, namely human and structural capital, play a major role in value creation.

The third and last level of value creation is highly future oriented. Here, human capital contributes to the development of new business from data and creates new data by combining different data sources. In addition, structural capital enhances and enables the utilisation of external sources, combining them with the organisational data to create value. In addition, when achieving this level of value, utilising machine learning and artificial intelligence was viewed as a potential part of structural capital. Creating value was also viewed as a goal, not only via the original business concept and utilising the existing data sources, but also from proactively seeking new opportunities to grow the business by utilising external data sources.

As a summary, value creation, utilising external data sources and capabilities in the private healthcare sector, can be considered multidimensional. Human capital and structural capital play a significant role in the value-creation process. By studying the value creation concept, we can identify the three levels of value creation from utilising different data sources (Möller, Rajala and Svahn, 2005; Ratia and Myllärinemi, 2017). The IC dimensions of human and structural capital are strongly involved in each level of value production.
5. Conclusions and discussion

This paper introduced a fairly novel, empirically focussed approach to discussing the role of IC in data-driven value creation in the Finnish private healthcare sector. The healthcare sector is changing rapidly and seeking new, better ways of improving performance; especially in the private sector, there is a clear need for better decision-making procedures (Ratia and Myllärniemi, 2017). It is essential to identify the factors affecting data-driven decision making. In addition, this paper illustrated the importance of different data source utilisations, especially combining internal and external data sources, along with their potential to create value. We analysed the value-creation factors through the concept model of value creation, seeking to achieve a better understanding of the key factors in each level of data-driven value production and the ability to identify the different dimensions of IC to create value (Möller, Rajala and Svahn, 2005; Myllärniemi and Helander, 2012). In addition, having private healthcare companies, as well as the consulting industry’s perspective on the discussion of external data source utilisation and organisational capabilities, can help us to understand the role of IC dimensions in BI tool utilisation.

The research showed that, out of the IC dimensions, human capital and structural capital can have a significant role in data-driven value creation in private healthcare. However, existing organisational capabilities or competences in BI utilisation were considered insufficient for fulfilling organisational ambitions. Clearly, all the private healthcare companies were required to seek external capabilities or competences in BI utilisation to some extent. The requirements for external resources varied, from deep technological know-how to strategic approaches. In addition, it was clear that the need for capabilities will grow in the future. Structural capital can also be a valuable asset in terms of data-driven value creation. Nevertheless, utilisation of different data sources was seen as extremely important, now and in the future. After all, combining organisational data with external data can create new data, and thus, new business opportunities, which could turn into value. However, it is clear that the journey toward external data utilisation has begun, with some of the organisations being at the beginning of the journey and some already taking their second steps.

Based on the conducted research, some managerial implications can be drawn for private healthcare. First, external data combined with organisational data can potentially create new business concepts. Advanced utilisation of different data sources, internal and external, can enable the creation of new data and enhance organisational decision making. Second, focussing on the organisational capabilities or competence in BI tool utilisation can support data-driven value creation. Furthermore, human capital or capabilities are required not only in terms of BI-tool utilisation, but also on a strategic level, to improve data-driven decision making in the organisation. Third, the significance of external data utilisation will also grow in the future. Again, the potential of organisational value creation will be the driver for using more external data sources. In addition, the search for completely new business concepts and opportunities is an essential driver. However, IC dimensions can have a significant role in the development of data-driven decision making, as data have no value per se if there are no capabilities to use it. As there can be internal and external capabilities involved, knowledge sharing has a key role. There is a clear need to develop internal capabilities that enable BI tool utilisation and data-driven decision making. To some extent, external consultants can provide support to both. However, the development of capabilities can appear only when there is true knowledge sharing between the organisation and consultants, enabling the organisation to learn on a strategic and BI tool-utilisation level. Although some of the practical tasks and strategic development can be outsourced to external consultants, there must be a certain level of capabilities inside the organisation, especially in terms of data-driven decision making.

The practical outcome of this research will provide insight into the role of human capital and structural capital in data-driven value creation. In addition, it introduces a future-oriented data-driven approach that can create new business concepts for private healthcare companies. Sufficient capabilities or competence in BI tool utilisation, along with external data source utilisation, would increase the value creation ability among private healthcare sector companies. However, to uncover a deeper view on this issue, we need to gather more empirical data from private healthcare, at different organisational levels. Furthermore, it will be necessary to study the role of networks and relational capital in accessing different external data sources. In addition, we need to investigate the required capabilities of BI tool selection, so that we can point out specific tool requirements and functional features that are essential for the private healthcare sector, and we need to look at the consulting industry perspective for gaining a deeper understanding of data-driven value creation (Chen, Chiang and Storey, 2012; Brandão, et al., 2016; Ratia, et al., 2017).
References


Knowledge Management in Small and Medium Architecture, Engineering and Construction Firms in Turkey

Burcu Balaban-Ökten¹ and Selin Gundes²
¹Department of Architecture, Fatih Sultan Mehmet Vakif University, Istanbul, Turkey
²Department of Architecture, Division of Construction Project Management, Mimar Sinan Fine Arts University, Istanbul Turkey
burcuokten@fsm.edu.tr

Abstract: This paper explores the extent to which small medium Architecture, Engineering and Construction firms (AEC) in the construction sector implement knowledge management (KM) approaches. Using data from semi-structured interviews of twenty-eight AEC firms operating in the construction sector, KM needs and challenges are analyzed and discussed. Breakdown of SME’s into micro, small and medium sub-categories reveals that the management of, in particular, tacit knowledge becomes complicated as firms grow in size. Results show that microenterprises to a great degree do not experience problems in the effective management of knowledge due to the organizational context where owner managers retain total control of the business. The most significant problem areas in the small and medium categories, on the other hand, emerge during conversion of tacit knowledge into explicit, followed by the unorganized storing of digital folders by employees and in accommodating heavy e-mail traffic. Thus, best practices aligned with the needs of firm size are recommended.

Keywords: Knowledge Management, Construction sector, Turkey, Firm size, SMEs.

1. Introduction

Construction is a knowledge intensive and project-based sector where projects differ by their size, technology, complexity, and budget (Hari, Egbu and Kumar, 2005). The diversity of project types and characteristics constitute one of the key features of construction projects; the uniqueness. Unique projects require a strong collaboration among diverse groups of professionals and project teams. However, combined with the “tensions between the temporary projects and the permanent organizations” (Pemsel et al., 2014) managerial and governance complexities emerge in project-based industries (Pemsel et al., 2014). In particular, project teams encounter significant problems in managing project knowledge due to unsystematic KM practices (Schindler and Eppler, 2003; Abdul-Rahman, Wang and Malay, 2012). According to Loforte Ribeiro and Timóteo Fernandes (2010), KM based problems borne from ineffective knowledge sharing, capturing, storing and reusing lead to unforeseen costs in construction projects. Poor KM practices have also been reported to cause delays in project schedules (Abdul Rahman et al., 2008) and reduced quality of products (Kim, 2014a).

Knowledge in the construction sector is mainly based on the experiences of professionals. Although the sector is seemingly using explicit knowledge such as drawings, specifications, documents and timelines, tacit knowledge which represents experiences and perceptions of individuals (Koskinen, Pihlanto and Vanharanta, 2003) remain as one of the unresolved KM issues. Previous studies in the field have focused on capturing lessons learned from previous projects (Todorović et al., 2015), storing and reusing knowledge (Shokri-Ghasabeh and Chileshe, 2014; Ferrada et al., 2014; Lee and Egbu, 2007; Hari, Egbu and Kumar, 2005), the process of creating knowledge and innovation (Durst, Edvardsson and Bruns, 2013; Emmitt, Pasquire and Mertia, 2012; Xiao and Boyd, 2006), sharing knowledge (Beylier et al., 2009; Capo-Vicedo, Mula and Capó, 2011; Park et al., 2013), and effect of KM on project performance (Reich, Gemino and Sauer, 2014; Robinson, Carrillo and Anumba, 2004).

Several previous studies have argued that large-scale construction firms to a large extent develop their own KM systems (Kale and Karaman, 2012; Kim, 2014b; Pellicer et al., 2014; Venkateswaran and Aundhe, 2013). SMEs on the other hand, do not have formal KM strategies (Coyte, Ricceri and Guthrie, 2012). As a driving force for national economies, SMEs constitute approximately over 90 percent of all OECD member countries’ enterprises (Wee and Chua, 2013) and thus effective management of knowledge has substantial importance in promoting growth. However, KM systems have not still become widespread due to perceived complexity, high costs and poor functionality (Wong and Aspinwall, 2005; Durst and Edvardsson, 2012; Park et al., 2013). Research in this regard shows that there is still a lack of understanding about the needs of SMEs in managing knowledge (Durst and Edvardsson, 2012). In particular, there is a lack of understanding about capturing tacit...
knowledge (Boyd, 2013). Previous research about KM practices in Turkey focus on the state of the art situation in KM systems use and the problems experienced by SMEs (Acar et al., 2005; Ipçıoğlu and Çelik, 2008; Bozbura, 2007). These studies have also emphasized the need for further research regarding KM practices in construction SMEs. Thus, it is of significant importance to identify the needs and common problems encountered in managing knowledge in construction SME’s.

The present paper aims to increase our understanding of current KM practices adopted in the AEC industry in Turkey, to identify problems and to determine the needs of construction organizations in managing knowledge. In this regard, two research questions have been identified for the purpose of investigating the KM related attitudes of SMEs active in the building construction industry in Turkey.

1. Is there a significant difference between SMEs of different sizes in terms of their current KM systems use and methodologies adopted?
2. How do KM problems experienced in SMEs change according to the classification criteria?

The paper is organized into three main sections. First, an extensive literature review of KM studies in construction is presented, then research methodology and design are explained. The next section provides results of interviews followed by a thorough discussion of problem areas and recommendations. The final section of the paper provides conclusions and implications.

2. Literature Review

Knowledge is the ability to understand information which is acquired through education or experience. In another sense, knowledge is explained as being aware of something, reaching a truth or an influence through deduction. Polanyi (1996) described knowledge by categorizing it into two sub-groups; explicit and tacit knowledge. Explicit knowledge is a codified knowledge which is formal and tangible. On the other hand, tacit knowledge is often subconscious and internalized. Human experiences are good examples of tacit knowledge. Basically, tacit knowledge is what is in our heads, and explicit knowledge is what we have codified.

Knowledge is considered to be an important asset for organizations (Turner, 2014). KM is an approach for firms to use their organizational knowledge effectively in new projects, and produce innovative information. Knowledge is seen as an important resource for competitive advantage in construction enterprises (Egbu et al., 2005; Ahmad et al., 2008; Chen and Fong, 2013). KM plays a significant role in innovation (Venkateswaran and Aundhe, 2013; Kamara et al., 2002), in improving work performance (Venkateswaran and Aundhe, 2013; Reich, Gemino and Sauer, 2014), in building customer satisfaction (Lee and Egbu, 2007) and in maintaining an effective working environment. Indirect positive effects of a successful KM system include reduced project durations, decreased costs, and increased quality (Shelbourn et al., 2006; Park et al., 2013).

The construction sector is often described as a knowledge-intensive industry (Egbu and Robinson, 2008) and projects involve various professional project teams. Knowledge and team-based structure of the sector requires the use of effective KM systems (Scully and Khosrowshahi, 2011). Although research reveals that there is an increasing awareness of KM in the construction sector, many difficulties are faced in managing knowledge and in general firms do not implement systematic KM. Several reasons exist for poor KM practices in the sector. While the lack of firm resources stand out as one of the most prominent obstacles ((Oke, Ogunsemi and Adeeko, 2013), other types of barriers such as lack of employee time and lack of clear guidance (Ferrada et al., 2014; Shokri-Ghasabeh and Chileshe, 2014) and poor management support are also identified to contribute to the inefficiency of KM practices.

Research has also proved that KM challenges vary according to firm size. The study by Shokri-Ghasabeh and Chileshe (2014) which focuses on the barriers to capturing lessons learned in the Australian construction sector showed that the first barrier was the lack of employee time irrespective of firm size. However, lack of the resources was only observed to be a barrier for small size firms, whereas it was among the least ranked by large contractors.

A distinction can also be observed between the KM practices of enterprises operating in different service areas of the sector. In design firms, knowledge creation takes place at each step of the project design. Each project requires a unique design solution and each detail should be redesigned according to changing needs. As a
result, it becomes hard to use explicit knowledge from previous projects (Styhre, 2011; Demian and Fruchter, 2006). In contracting firms however, professionals working in construction sites need to create new knowledge from project changes and past mistakes (Senaratne and Sexton, 2008) although this is not always possible. For example, Ferrada et al. (2014) studied KM practices in construction sites for medium sized construction firms in Chile and found that lessons learned from previous projects are often lost due to the lack of time and organizational procedures. According to the authors, this type of knowledge cannot be captured and stored by the professionals and as a result, firms miss the opportunity of using this information in preventing mistakes in new projects.

Difficulties in capturing and sharing tacit knowledge is another factor that contributes to poor KM implementations. Forcada et al. (2013) emphasize that lack of knowledge management and in particular, the difficulties associated with managing tacit knowledge leads to costly mistakes in the Spanish construction sector. The authors suggest that changes in organizational culture are critical for an effective KM. Senaratne and Sexton (2008) bring a new perspective to project changes by providing knowledge-based explanations to change problem-solving in construction teams. The authors studied how firms manage project changes and unfolded the underlying learning processes. Results revealed that after project changes, professionals use meetings and face to face dialogues to solve problems. However, they found that professionals can only focus on explicit knowledge, while knowledge about problem solving stages stay tacit and these stages could not be documented. The authors thus relate repeated mistakes in projects to the difficulty of sharing tacit knowledge and suggest that codifying learning processes could be useful in this respect. Similarly, Scully and Khosrowshahi (2011) indicate that 80% of tacit knowledge in projects cannot be converted to explicit knowledge and active sharing of this knowledge could help firms increase their learning.

According to Styhre and Gluch (2010), knowledge sharing is defined as one of the most complex social processes in today’s industry. Various methods exist for the sharing of knowledge in construction enterprises, ranging from meetings to work reports, communication tools, technical project documents and computer-based systems. Despite the well-known benefits of using databases to minimize KM problems, research reveals that databases are of limited use in construction. Xiao and Boyd (2006) emphasize that in the construction sector, it is hard to use databases to reach useful knowledge when needed due to the nature of the working environment where it is not always possible to use databases and propose a learning methodology and process for organizational learning.

The construction sector, with its strong backward linkages with other sectors in the economies, is recognized to play a key role in economic growth (Gundes, 2011). The construction industry is seen as a craft base industry (Stinchcombe, 1959; Rooke and Clark, 2005). The structure of the industry resembles a hierarchical pyramid, where the upper part consists of large-scale construction companies and the base is composed of relatively smaller size enterprises, in particular sub-contractors. Sub-contractors are architecture, engineering, construction, and craft base firms with sizes ranging from micro, to small, and finally to medium. In this regard, SME’s, which consist of an overwhelming majority of all enterprises in most countries and employ the majority of workers, are of particular interest in promoting development.

SME’s present several characteristics that differentiate them from their larger counterparts such as informal organizational structures, lack of resources, the presence of owner-managers and the provision of service to small markets with a limited customer portfolio. These characteristics of SME’s generate well-known difficulties in a number of areas, however, coupled with the unique and project-based nature of the construction sector, problems get worse. In particular, the project based environment requires SMEs to build a different collaborative working structure for each new project. Project schedules, costs, teams, and technologies change according to project size and type, therefore a different managerial strategy should be adopted for new projects. In this regard, SMEs are reported to experience difficulties in capturing the knowledge (Egbu, Hari and Renukappa, 2005), reusing learned lessons (Emmitt, Pasquiere and Mertia, 2012), learning from problems (Xiao and Boyd, 2006) and sharing knowledge among project teams (Alashwal, Rahman and Beksin, 2011; Capo-Vicedo, Mula and Capó, 2011). Park et al. (2013) argue that the main barriers for effective KM in construction SMEs are to capture the knowledge from professionals, to code it using communication tools and to reach it when needed. Thus, the authors proposed a web-based construction knowledge management portal (CKMP) in order to capture the knowledge, store it and share it on the web with other SMEs from the sector. Lee and Egbu (2007) designed an IT-based construction site diary for
professionals. The purpose of this study was to capture learned lessons from professionals with an easy audio-text diary and share among the web with other professionals from the firm.

Research in the area emphasizes that managing both tacit and explicit knowledge is important for project performance (Gemino, Reich and Sauer, 2015). As knowledge in the sector largely depends on the experiences of the professionals and these cannot be captured as explicit information, the only way of sharing experiences is through face to face communications, meetings, and storytelling. However, professionals in SMEs usually have to deal with many tasks at the same time and all KM related activity is perceived to be a time loss. In such an environment, reusing this experience in new projects requires continued access to certain individuals; however, this is almost always limited due to busy working schedules.

According to Durst and Edvardsson, (2012) more studies are needed for KM in SMEs, taking into account country differences, and heterogeneity between SMEs generating from size and idiosyncratic characteristics of industries. Although studies exist on the use of information and communication technologies (ICT) (Acar et al., 2005; Cakmak and Tas, 2012; Sarshar and Isikdag, 2004), knowledge management practices (Kale and Karaman, 2011), on capturing knowledge in large construction companies (Kivrak et al., 2008), and on the impact of national culture on knowledge sharing (Kivrak et al., 2014) for the Turkish construction sector, the current use of KM practices and problems experienced within the SMEs have not yet received considerable attention from researchers.

3. Methodology

The qualitative research method was selected in this study in order to provide an in-depth understanding of KM approaches and problems experienced by the Turkish AEC sector professionals. A semi-structured interview method was adopted in order to understand the current KM implementation structure and challenges observed in the construction industry. Convenient and purposive sampling methods were used to identify the sample group in order to reach informational saturation. According to the busy schedule of the AEC professionals interviews conducted over the telephone.

As Turkish Construction sector was taken as a case in the present study, first there was a need to identify the state-of-the-art situation in the sector in order to clarify the interview structure. Therefore, 7 pilot interviews were conducted. The sample group in pilot interviews not only included SME’s, but also large-scale enterprises. This was done purposefully as large scale and small/medium scale enterprises are continuously in close interaction due to the need for collaboration in construction projects. Thus, the identification of additional KM challenges and requirements borne from these relationships was necessary.

In the second phase, 21 professionals from construction SME’s were interviewed based on a revised interview structure created from both the findings of pilot interviews and an extensive literature review. The sample group comprises firm owners and project managers with at least 5 years of work experience. All interviews were made by telephone and lasted between 30 and 60 minutes. Interviews were not recorded upon requests of respondents, thus notes were taken which were then converted into digital documents. Once the interviews were completed, the research proceeded with coding. At first, a deductive coding method was adopted to classify results according to subject categorization identified in previous literature. Secondly, an inductive coding method was applied in order to find out if any additional categories could be obtained from interviews.

3.1 Pilot Interviews

Pilot interviews were designed to identify the main issues that will be addressed in the final interview structure. Occupational information about the interviewees is provided in Table 1. Two firms in the sample, namely company 1 and 2 are small sized, company 3 to 5 are medium sized and the remaining two firms are large scale.
Several tentative results can be deducted from pilot interviews. A combined assessment of responses revealed that KM practices, needs, and problems experienced vary according to firm size and services offered. First, it was observed that 3 enterprises out of a total 7 used KM systems and one was in the phase of transition. Although both of the two small size firms reported problems in managing knowledge, they have still not adopted any KM systems. One out of three medium-size firms and both of the large enterprises in the sample use a KM system. These findings reveal that while large-scale firms have successfully established KM systems long ago, small and medium-sized enterprises, except PI 3, do not use a standardized system to manage knowledge.

Second, in order to respond to their KM needs, small firms prefer to use e-mails and server systems for sharing explicit knowledge and meetings and face to face interactions for tacit knowledge. Thus, at a first glance, one could see that smaller scale firms found low cost and low technology KM solutions more effective and suitable for sharing and creating knowledge. However, problems are reported for classifying visual documents and storing them in server systems. This problem was in particular valid for those firms which operate from multiple locations.

Third, most of the firms regardless of size have expressed concerns over information exchange between construction sites and headquarters. While KM was observed to be easier in design firms due to increased communication among teams working in the same office, it was reported to be more problematic in particular for construction firms where employees are spread among multiple locations, i.e. construction sites.

Fourth, interview results show that different types of KM solutions and problems exist for medium-sized firms where the nature of solutions depended on firms’ service area. Design firms were once again reported to experience fewer problems in this respect. For example, the design office of PI-3 hired a software company to develop a KM system tailored to its own needs and currently, the system works effectively due to the determined mindset of owners. However, SMEs that provide both design and construction services face significant problems in managing knowledge between headquarters and construction sites as the latter usually functions almost as a separate and independent entity. In all of the sample firms, regular reporting from one project manager appeared to be the sole connection between sites and the head office. However, although all interviewees clearly acknowledged the possible consequences of losing key personnel in such a structure, no backup KM strategies were developed.

One of the objectives of conducting pilot interviews was to identify any additional KM requirements and difficulties borne by the collaboration between large scale and small/medium scale enterprises in some projects. However, interviews have shown that collaborative projects are not an obstacle, but instead an opportunity for SMEs for learning and establishing effective KM systems as they come with no cost and effort. As stated before, these are rather tentative results and therefore there was a further need to conduct more interviews with professionals from the small and medium-size portion of companies of the sector where real KM implementation problems exist. Therefore, based on preliminary findings from pilot interviews and an extensive literature review a final interview structure was generated (Table 4 see in the appendix). Then, 21 semi-structured interviews with professionals from the construction sector were conducted.

Table 1: General information about pilot interview participants

<table>
<thead>
<tr>
<th>Interviewee</th>
<th>Occupation</th>
<th>Service Area</th>
<th>Position</th>
<th>No. of Employees</th>
</tr>
</thead>
<tbody>
<tr>
<td>PI-1</td>
<td>M. Architect</td>
<td>Architectural design and contracting</td>
<td>Owner</td>
<td>11</td>
</tr>
<tr>
<td>PI-2</td>
<td>Architect</td>
<td>Architectural design and contracting</td>
<td>Project Manager</td>
<td>28</td>
</tr>
<tr>
<td>PI-3</td>
<td>M. Architect</td>
<td>Architectural design</td>
<td>Project Manager</td>
<td>63</td>
</tr>
<tr>
<td>PI-4</td>
<td>M. Str. Eng.</td>
<td>Contracting</td>
<td>Project Manager</td>
<td>80</td>
</tr>
<tr>
<td>PI-5</td>
<td>M. Architect</td>
<td>Project management</td>
<td>Project Manager</td>
<td>150</td>
</tr>
<tr>
<td>PI-6</td>
<td>Ind. Eng.</td>
<td>Contracting</td>
<td>Planning Manager</td>
<td>&gt;250</td>
</tr>
<tr>
<td>PI-7</td>
<td>M. Str. Eng.</td>
<td>Project management</td>
<td>Project Manager</td>
<td>300</td>
</tr>
</tbody>
</table>
3.2 Interviews

Participants were selected according to experience in the field, position in the company and their willingness to be interviewed. The interviews were again conducted by telephone and lasted between 30 and 60 minutes. The total of 21 interviews was completed in approximately one and a half months. Table 2 shows the occupation, job title, sectoral experience and educational background of participants. As it can be seen from the table, an overwhelming majority of participants have architectural education as a background and firm owners followed by project managers predominate the ‘position’ field. More than half of the participants have a sectorial experience between 11 and 20 years while one-third of the participants have more than 21 years of experience in the sector.

Table 2: Background of participants

<table>
<thead>
<tr>
<th>Characteristics</th>
<th>No. of Employees</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Occupation</strong></td>
<td></td>
</tr>
<tr>
<td>Architect</td>
<td>18</td>
</tr>
<tr>
<td>Structural Engineer</td>
<td>2</td>
</tr>
<tr>
<td>Restoration</td>
<td>1</td>
</tr>
<tr>
<td><strong>Education</strong></td>
<td></td>
</tr>
<tr>
<td>Graduate</td>
<td>10</td>
</tr>
<tr>
<td>Post Graduate</td>
<td>10</td>
</tr>
<tr>
<td>PhD</td>
<td>1</td>
</tr>
<tr>
<td><strong>Position in the Firm</strong></td>
<td></td>
</tr>
<tr>
<td>Firm Owner</td>
<td>10</td>
</tr>
<tr>
<td>Project Manager</td>
<td>8</td>
</tr>
<tr>
<td>General Coordinator</td>
<td>2</td>
</tr>
<tr>
<td>Advisor</td>
<td>1</td>
</tr>
<tr>
<td><strong>Sector Experience</strong></td>
<td></td>
</tr>
<tr>
<td>5 - 11</td>
<td>3</td>
</tr>
<tr>
<td>11 - 20</td>
<td>11</td>
</tr>
<tr>
<td>≥21</td>
<td>7</td>
</tr>
</tbody>
</table>

Table 3 provides data about the size and service areas of participant firms. The sample includes a variety of service areas ranging from pure design to contracting and project management. As pilot interviews showed that there is a close relation between firm size and their KM implementations, the sample group is further categorized into micro, small and medium scale firms according to the categorization adopted by both Turkish government (Official Gazette, 2012) and European Commission (2015).

Table 3: Size and service areas of firms

<table>
<thead>
<tr>
<th>Service area</th>
<th>Micro</th>
<th>Small</th>
<th>Medium</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Contractor</td>
<td>1</td>
<td>3</td>
<td>3</td>
<td>7</td>
</tr>
<tr>
<td>Architectural Design</td>
<td>3</td>
<td>1</td>
<td>-</td>
<td>4</td>
</tr>
<tr>
<td>Architectural Design and PM</td>
<td>1</td>
<td>1</td>
<td>-</td>
<td>2</td>
</tr>
<tr>
<td>Design and Build</td>
<td>1</td>
<td>5</td>
<td>1</td>
<td>7</td>
</tr>
<tr>
<td>Project Management</td>
<td>-</td>
<td>-</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>6</td>
<td>11</td>
<td>4</td>
<td>21</td>
</tr>
</tbody>
</table>

The interviews were structured using open-ended questions under four themes, general information about interview participants and companies, current knowledge management systems and methodologies, knowledge management problems and opinions about knowledge management systems. The questions were intended to explore and understand the “what”, “how” and “why” behind each KM process. Table 4 provides...
data about the interview questions. Questions are designed according to the information provided from pilot interviews.

Table 4: Interview questions

<table>
<thead>
<tr>
<th>Section</th>
<th>Topic</th>
<th>Questions</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Part One: General Information about Interview participants and Companies</strong></td>
<td>Company Information</td>
<td>Company name / Number of employees / Company service areas</td>
</tr>
<tr>
<td></td>
<td>Interviewees information</td>
<td>Name / Occupation / Position in the company / Experience in the company / Experience in sector / Education</td>
</tr>
<tr>
<td><strong>Second Part: Knowledge Management</strong></td>
<td>Current knowledge management systems and methodologies</td>
<td>What kind of knowledge is created in the company?</td>
</tr>
<tr>
<td></td>
<td></td>
<td>How do you share knowledge?</td>
</tr>
<tr>
<td></td>
<td></td>
<td>How do you store knowledge?</td>
</tr>
<tr>
<td></td>
<td></td>
<td>How do you adapt newcomers to the company?</td>
</tr>
<tr>
<td></td>
<td></td>
<td>How do you share company information with newcomers?</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Do you use old project information for new projects?</td>
</tr>
<tr>
<td></td>
<td>Knowledge management problems</td>
<td>Did you experience any knowledge loss by employee turnover in the company?</td>
</tr>
<tr>
<td></td>
<td></td>
<td>What kind of knowledge management problems are you facing in projects?</td>
</tr>
<tr>
<td></td>
<td></td>
<td>What is your opinion about the underlying causes of the knowledge management problems?</td>
</tr>
<tr>
<td></td>
<td></td>
<td>What could be the solution to knowledge management problems according to you?</td>
</tr>
<tr>
<td></td>
<td>Opinions about knowledge management systems</td>
<td>So far, did any firm offer your company a knowledge management system?</td>
</tr>
<tr>
<td></td>
<td></td>
<td>If yes, what type of system was it?</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Did you think the system they suggest would be useful for you?</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Why?</td>
</tr>
<tr>
<td></td>
<td></td>
<td>If you thought, it was useful did you buy the system? Why?</td>
</tr>
</tbody>
</table>

4. Findings

4.1 KM Practices in Micro Size Firms

In this study, firms that have less than 10 employees are grouped under the micro category. Three out of a total of six micro firms in our sample provide design services, two design builders and one is a contractor. While none of the micro-sized firms have adopted a systematic KM, only one of them used a server system to manage explicit knowledge. All firms stated that explicit knowledge is stored in office computers and shared by e-mails. Half of the respondents additionally stored hard copies of documents. The only contractor in the sample kept information also on web-based databases. Although the majority of companies belonging to the micro category observed no significant problems in storing and sharing of explicit knowledge, one respondent stated that they experienced knowledge loss due to computer breakdowns since they did not have any backup systems. Sharing knowledge through e-mails were also found to be problematic by one respondent from a design company as the architects raised concerns about time constraints.

In all micro-sized companies, meetings and face-to-face communication were common ways of managing tacit knowledge. Capturing and sharing of tacit knowledge was not perceived to be a real problem among the companies in this category. This was attributed to the organizational structure in micro firms where owner managers organize all job activities and thus they create, share, store and reuse their own knowledge.

There was a consensus among interviewees about the relationship between the emergence of KM problems and growth. Respondents emphasized that KM problems started to occur in particular when they attempted to get larger in size and thus when owners had to transfer some of the responsibility to workers. In this concept, two micro-sized firms pointed out that when the number of the projects undertaken in a period increased, the
firms had to hire new employees and the knowledge within the company could not then be managed as efficiently as it was before. However, this solution also did not resolve the KM problems as it was realized that a significant amount of information was lost.

4.2 KM Practices in Small Size Firms

Firms that have between 10 and 49 employees are categorized as small size firms. 10 interviewees from a total of 21, work for companies that belong to the small size category. Five of these companies are design-builders, three of them are contractors and the remaining two provide design services.

Many similarities in KM practices and problems have been observed among the enterprises in this group independent of the service area. For example, an overwhelming majority of interviewees stated that no systematic KM was adopted, however, server system use was common among all firms. Most of the firms in this group also preferred to keep hard copies of documents and shared them via e-mails.

Several types of problems exist in the storing and sharing of explicit documents. Some firms complained that one file is saved several times in the system, thus leading to confusion and time loss. Others experienced knowledge losses due to computer breakdowns and difficulties in managing knowledge obtained through e-mails. However, the most significant problem appeared to be the unorganized storing of knowledge caused by individuals who fail to record files in a systematic way. In this concept, one respondent from a construction company mentioned a crisis where an employee saved construction related information on his computer and interim payment documents were lost upon his sudden leave.

The procedures for sharing of tacit knowledge within companies also showed many similarities. For example, all of the interviewees stated that they organized systematic meetings and demanded standardized documentation and report systems in an attempt to respond to their KM requirements. However, participants in this category also admitted that their efforts for creating, sharing, storing and reusing tacit information failed in many points. In this regard, a distinction has been made between the difficulties in managing explicit and tacit knowledge. While these firms could somehow manage to store explicit knowledge in a server area and share these documents through an intranet, the storing and reuse of tacit knowledge was reported to be much more problematic.

In the sample firms, knowledge creation, capturing and sharing are mostly done by the meetings and face-to-face interactions. They all try to avoid misunderstandings by talking and asking questions repeatedly. However, language differences for international companies, insufficiency of the technological base in video-conferences and the interpretation of knowledge gained from meetings remain to be problematic. While all acknowledged the necessity of recording tacit knowledge, still participant firms faced difficulties in transforming tacit knowledge into explicit. Communication with stakeholders is perceived to be even much more problematic as different parties in this group do not share a common physical space and thus they remain devoid of the advantages of working in a face-to-face setting. While project teams could interact with each other and resolve misunderstandings to a certain extent as they are in general based in the same location, this is obviously not the case for stakeholders.

An overwhelming majority of participants stated one particular problem in storing and re-using the knowledge gained from previous projects. In this regard, key personnel appeared to be of significant importance in KM among the small size segment as respondents perceived the loss of a key personnel as the loss of knowledge. Most of the firms in this group attempted to establish a documentation system in order to overcome this problem; however, they encountered severe resistance from employees using the systems. Interviewees stated that busy schedules and the lack of time were the main reasons for employees’ unwillingness to use these systems.
4.3 KM Practices in Medium Size Firms

In the present study, the firms which have between 50 and 249 employees are categorized into the medium size group. Interviews were made by the representatives from 5 firms, 3 of which are contractors. IT system used for the management of knowledge was identified to be a common practice in medium-sized firms except for one design-builder. The storing and sharing of explicit knowledge is undertaken through server systems, e-mails, and hard copies. In this regard, several problems are reported by respondents. First, the sharing of knowledge through e-mails is reported to result in communication gaps due to the lack of follow up procedures for tracking e-mail traffic. Second, half of the respondents from this group mentioned that the biggest KM related problems in projects are caused by revisions. However, information updates about revised drawings such as revision number and date are usually not included in relevant documents, thus leading to confusion. When the respondents were asked to state the possible solutions to this problem area, they all stated that the dissemination of Building Information Modeling (BIM) throughout the sector could be a solution. However, despite efforts, the necessary infrastructure was still not established. Third, similar to small size firms, unorganized storing of knowledge appears to be problematic due to poor systematic recording by employees. In this regard, one respondent pointed out that employees were not willing to share unfinished tasks in a common digital environment.

When the firms start to get larger in size, either through new employees or larger projects, new departments, groups or project teams are established in order to increase manageability. However, in that case, communication and knowledge sharing problems start to occur between different departments and project teams. For example, several respondents from this group thought that sharing knowledge by phone and/or e-mail was not an efficient way of managing knowledge in larger-scale projects. Firms reported that they frequently encountered problems in this respect, as the necessary information was not always shared with all partners. In that case, a repeated effort was needed for sharing the same knowledge several times and thus delays occurred.

When the respondents were asked to state the most efficient ways of sharing tacit knowledge, meetings and face-to-face interactions outweighed other forms of communication. Respondents felt that the main challenge in this field was the conversion of tacit into explicit knowledge by coding and storing them in databases. These findings confirm that similar to other groups, middle size group also loses a significant amount of knowledge created by experiences. In this regard, one interviewee from a contracting company suggested that post-project meetings organized after each project could create a learning environment where employees could discuss important topics and experiences gained from the completed project in question.

A close examination of the resistance of employees in using KM systems revealed that the time and experience needed to use these systems accurately were the main obstacles. In this regard, the general coordinator of a contracting firm mentioned that weekly working hours in the Turkish construction sector are above the world standards. According to the interviewee, while this fact increases the attractiveness of Turkish construction companies in the global arena, it, on the other hand, contributes to the unwillingness of employees to spend time on writing reports. Thus, it was emphasized that KM systems should be very easy to use in this busy schedule of construction work.

5. Discussion

Interview results suggest that KM practices and problems were similar within each sub-group, namely the micro, small and medium segments of SME’s. Detailed analysis of sub-categories reveals that as the size of the firms grows, the need for a systematic KM increases. The companies in the micro and small categories do not use a systematic KM. Indeed, there appears to be no real need for complex IT-based KM systems for the effective management of knowledge in the micro category as owners assume most of the responsibility and control tasks. Knowledge sharing and storage issues can somehow be resolved in the micro category which has relatively few employees and thus a hierarchical organizational structure is not needed. Few problems are encountered in this group such as knowledge loss due to computer breakdowns and heavy e-mail traffic. While the former could easily be resolved through the use of a simple internet-based system, the latter requires more radical solutions as interview results suggest that it is a common issue in all categories.

Companies belonging to the small category experience more serious problems in the effective management of knowledge mainly due to unorganized storing of knowledge by employees, followed by the difficulties in
accommodating heavy e-mail traffic. Surprisingly, the majority of middle-sized companies who have already adopted KM systems also experience similar problems. This can be attributed to the nature of these systems, which only bring partial solutions to problems, rather than providing more comprehensive solutions suited to the needs of construction SMEs. For example, respondents suggest that using these systems, schedules are prepared as if one team is only responsible for one particular project. While this assumption could arguably be valid for large-scale organizations, this is not always the case in SMEs. With a limited amount of employees, one team in construction SMEs is usually responsible for several different projects and thus emergent schedules are not realistic in practice.

In this regard, it is clear that more holistic KM approaches are required which build on existing systems by providing solutions to the fragmentation problem rather than offering SMEs new options. This may take the form of an integrated system, which, by bringing projects, site-related documents, e-mails and other digital documents together, offers a comprehensive solution to the management of explicit knowledge (Acar et al., 2005). Such systems could also offer significant gains to small size organizations as interviews revealed that similar problems occur in moving from the micro to small category. In this concept, web-based project management systems already available on the market could be useful as they are highly affordable, easily set-up and user-friendly (Udeaja et al., 2008; Park et al., 2013). However, these systems should be customized by bringing together partial solutions in order to establish a customized system tailored to the special needs of firms. At this point, it should be stated that firms need to be guided for determining the correct combination of packages offered. This help could either be provided by an individual specialized in packages offered at the market, or through simple models that lead the way for senior management. Thus, future research should focus on establishing a roadmap that supports firms in setting up integrated KM systems; taking affordability, ease of use and the need for frequent system revision into account. The latter is in particular of great importance as interviewees pointed out that KM system revisions become inevitable due to technological progress. Another important point to consider is the need for KM systems in the local language as several respondents linked the irregular and disorganized use of established systems to the fact that only systems in a foreign language are available at the market.

Findings of employee resistance in using established KM systems confirm previous studies, which suggest that lack of time is the most important reason for failure in recording necessary files and updates (Shokri-Ghasabeh and Chileshe, 2014). An additional reason that emerged from interviews is the unwillingness of employees in sharing ongoing but incomplete project files in a common digital environment (Cheng et al., 2010). Although finding a remedy to such reasoning may seem difficult as it is directly related to cultural factors (Arif, Mohammed and Gupta, 2015), strong top management support for system commitment appears to be crucial (Shokri-Ghasabeh and Chileshe, 2014). In this regard, the establishment of a reward and penalty system by the large-scale contractor in pilot interviews may provide a useful solution. This could further resolve the problems encountered in the sharing of information associated with revisions, which appears to be the most prominent problem area in the medium size category.

Regardless of firm size, meetings and face-to-face communication emerge as common ways of managing tacit knowledge (Kivrak et al., 2008; Emmitt, Pasquire and Mertia, 2012; Xiao and Boyd, 2006). While the micro category does not experience a real problem in sharing and reusing of tacit knowledge due to the owner controlled, flat organizational structure, almost all of the small and medium companies acknowledge the need for a simple way of converting tacit into explicit knowledge, but fail in this respect. Several previous studies have offered the use of audio-diaries for tacit knowledge problem in construction projects (Lee and Egbo, 2007; Lee et al., 2005). However, respondents raised concerns over their practicality in terms of time and effort needed in searching for specific project related problems, in describing the scope, and in allocating time for listening to these audio-diaries in busy schedules.

Computer-based data cards, where project experiences and problems are briefly recorded, could constitute a simple and convenient way for employees to search for basic instructions on a wide range of project related topics (Carrillo, Ruikar and Fuller, 2012). Project team in this way could easily access information about past project experiences, that would otherwise disappear. In case detailed information about a particular issue is needed, then professionals could further refer to individuals in charge as their names and contact information will also be provided on cards. It would also be beneficial to include prominent information about suppliers, subcontractors and the names of individuals responsible for specific work items; as such an approach could also be useful in procurement decisions. For example, if, for any reason, senior management was displeased...
with a supplier or a subcontractor in a previous project, then it may choose not to work with that party again in future projects. Alternatively, the recurrence of a poor workmanship experience in a previous project could easily be avoided by recording craftsman related information on data cards and demanding subcontractors to accomplish that specific work item with a different worker in new projects. However, to the knowledge of authors, such package programs devoted to the creation of the information cards are yet not readily available in the local market.

As far as the differences in KM needs between design and contracting firms are concerned, a distinction emerged about the rationale for knowledge creation (Forcada et al., 2013). While design firms create knowledge by providing unique design and detail solutions in each new project, contractors have to create knowledge only when project changes and problems occur during implementation. However, knowledge sharing appears to be more problematic in contracting firms as teams are physically distributed in different locations. In particular, application errors and regular reporting problems come into prominence. Resolving the former requires that on-site errors are drawn, explained in detail and sent back to the head office. Then revised drawings are produced, issued and delivered to the site. It is apparent that such an approach is time-consuming and assuming that the process may repeat several times in a typical construction project, it may result in significant project delays. Site engineers need to use or prepare a variety of documents on site such as drawings, specifications, reports etc. Although notebooks are easily accessible, they are not suitable for use on site. Thus a common practice among site engineers is to use printed sheets of paper. However, communication and coordination barriers among project teams remain. In this regard, dissemination of mobile devices would be useful for obtaining real-time information about the site and for making revised drawings available to the whole project team.

The dissemination of BIM was found to be an important factor in minimizing current KM problems in SMEs (Forcada et al., 2013). However, the necessary technological and knowledge bases for BIM systems in the Country are not fully developed and there is a lack of experience in this respect, in particular for SMEs. Thus, more research is needed on the possible impacts of BIM on KM practices in construction SMEs.

6. Conclusions

The aim of this study was to assess current KM practices and to identify the problems associated with KM use in construction SME’s in order to define best practice and to provide recommendations aligned to the needs of different categories of SME’s. For this purpose, semi-structured interviews are undertaken with 28 professionals from the Turkish construction sector. Based on the research findings presented, several managerial and strategic implications are derived which could have the potential to contribute to an increase in KM efficiency in construction SME’s.

Research findings reveal that as the size of the firms grow, the need for a systematic KM increases. The heterogeneity of firms in the AEC sector in terms of size and the services provided, causes the need for customized KM systems for the firms. However, there appears to be a need for guidance to support firms in building the correct KM systems tailored to their structure.

Construction SME’s could benefit from research findings and recommendations in terms of problematic issues, solutions provided for resolving them and increased awareness on their specific needs borne from their core service area such as design or contracting. Results could also assist managers in focusing on critical areas such as the sharing of tacit knowledge and the importance of top management support for the smooth operation of KM systems.

Programs directed at providing KM solutions for the construction sector are suitable for mainly large scale and to a lesser extent for medium scale enterprises. Small organizations, in particular, find them complex and unaffordable. Most of the program recommendations in this study, on the other hand, are created for use in a wide range of sectors. Thus, it is apparent that Internet-based programs tailored to the needs of primarily small and medium construction firms are needed.

The main contribution of the paper has been a complete analysis of current KM practices and problems regarding KM use in SME’s operating in the Turkish AEC industry. The present research addresses a gap of knowledge through focusing on the SME subgroup in the Turkish construction sector. Findings from the study
may further assist governments, universities and other institutions in improving the performance of construction SME’s through the provision of KM training programs and support for research projects in the field. Finally, results could provide insight for future research that aims to develop suitable, efficient and innovative KM models and guidelines for SME’s.

The limitations of this study are the relatively small sample size and the convenience sampling process. Thus, the findings of the study cannot be generalized to the broader Turkish construction industry, and the insights on construction SMEs should be interpreted with caution.

References


A Know-How and Knowing-That Cartography for Improving knowledge Management in Medical Field

Sahar Ghrab¹,², Ines Saad²,³, Gilles Kassel² and Faiez Gargouri¹
¹MIRACL Laboratory, Higher Institute of Computer Science and Multimedia, Sfax, Tunisia
²MIS Laboratory, University Of Picardie Jules Verne, Amiens, France
³Amiens Business School, Amiens, France

ghrab.sahar@gmail.com
ines.saad@u-picardie.fr.
gilles.kassel@u-picardie.fr
faiez.gargouri@isims.usf.tn

Abstract: As a tool of Knowledge Management, knowledge cartography is used, in this paper, to enhance knowledge identification, sharing, representation and visualization in a healthcare organization as well as to deliver healthcare services and improve communication between healthcare professionals. The Know-How and Knowing-That concepts are used, in this paper, instead of the knowledge concept. Know-How is defined as the capacity to perform an action and Knowing-That is defined as a belief state related to a description which can be factual or prescriptive. For the construction of Know-How and Knowing-That cartography, a knowledge cartography methodology is proposed. It is composed of three steps: (i) identifying the concepts to visualize, (ii) identifying the graphical elements and (iii) choosing the cartography technique. This cartography is experimented in the ASHMS (Association of Protection of Motor Disabled of Sfax) to facilitate Know-How and Knowing-That identification, characterization and visualization.

Keywords: Healthcare knowledge management, knowledge identification, Know-How and Knowing-That cartography, knowledge visualization, Know-How, Knowing-That

1. Introduction

Confronted with demands of care quality, optimality, dynamicity and complexity, medicine is obliged to well manage their medical knowledge which is increasing (Stroetmann and Aisenbrey, 2012). To reach this objective, each healthcare organization must integrate a healthcare knowledge management (Nadeem et al., 2012).

Medical knowledge known also by healthcare knowledge «is dynamically contextualized to interpret the patient’s evolving health status, and to derive treatment interventions that will work for a specific patient in a specific healthcare setting. [It] can transform healthcare practices to achieve high levels of patient safety, care quality, team-care, patient centeredness, and cost-effectiveness» (Abidi, 2008). This knowledge is created through different modes like communication, exchanging and sharing knowledge between practitioners (global assessment), interrogation examination and assessment stored in medical records and other knowledge related to experiences and skills (Henry, 2010; Chen, 2013).

Healthcare Knowledge Management (HKM) is the confluence of formal methodologies and techniques to facilitate the creation, identification, acquisition, development, preservation, dissemination, modeling and use of various facets of a given healthcare enterprise’s knowledge assets. To enhance growth, development, communication and knowledge preservation in healthcare organizations, HKM allows healthcare professionals to reach rapid and assertive responses linked to the decisions they need to take (Rocha et al., 2012), to share tacit knowledge, collaborate, exchange, and identify the most crucial knowledge, preserve some knowledge at risk of loss, and improve the care quality and healthcare delivery (Morr and Subercaze, 2010).

HKM proposes tools and methodologies for the creation, identification, acquisition, development, preservation, dissemination, sharing and use of medical knowledge in healthcare organizations (Abidi, 2001). We distinguish between HKM methods and tools derived from knowledge engineering for knowledge modeling in the form of ontologies and those for the identification and preservation of medical knowledge. In particular, knowledge cartography is used as a tool of knowledge identification. Knowledge cartography is defined as the set of processes, tools and methods for knowledge analysis used to discover its characteristics,
meanings and visualization (IBM Global Service). Knowledge cartography is also a tool for knowledge representation and visualization using graphical entities to convey meaning for knowledge sharing, transfer and creation between at least two persons (Grey, 1999; Speel et al., 1999; Vail, 1999; Hylton, 2002; Vestal, 2005; Burkhard, 2005; Ebener et al., 2006; Bertschi et al., 2011; Aslizadeh and Ghaderi, 2015). The knowledge cartographies proposed in literature do not take into account knowledge, its stakeholder, its creators, its users, the actions performed through knowledge and the different descriptions related to knowledge.

In this paper, we propose a Know-How and Knowing-That cartography to enhance Know-How and Knowing-That identification, sharing and visualization between organization’s members. Know-How and Knowing-That are two types of knowledge and are used instead of knowledge to distinguish between its different natures (Fantl, 2012). We define Know-How as the capacity to perform an action and Knowing-That as a belief state related to a description (Ghrab et al., 2016) which can be a propositional attitude of having some attitude, stance, take, or opinion about a proposition or about the potential state of affairs in which the proposition is true (Schwitzgebel, 2014). A methodology for the construction of Know-How and Knowing-That cartography is proposed and it is based on three steps: (i) identifying the concepts to visualize, (ii) identifying the graphical elements and (iii) choosing the cartography technique.

Know-How and Knowing-That cartography is experimented in the ASHMS (Association of Protection of Motor disabled of Sfax) where our research group conducts their researches. Previous researches of our research group were tackled into account for Know-How and Knowing-That cartography building.

The plan of the paper is structured as follows. The next section is a literature review which encompasses a comprehensive and exhaustive coverage of available appropriate and contemporary literature details about the importance of knowledge cartography in healthcare and its use. A conceptual analysis of the knowledge concept is conducted in the third section. The fourth section details the methodology proposed for Know-How and Knowing-That cartography construction. The fifth section describes our application context and the results of the experimentation of Know-How and Knowing-That cartography in the ASHMS. The next section is about findings and discussion. The last section provides a general overview of the contributions proposed in this paper and we present the research perspectives hopefully to be achieved in the future.

2. Literature review

Visualizations and knowledge cartographies are used in healthcare in numerous ways ranging from the study of the basic principles of creating knowledge cartographies, to the cognitive processes underlying their use, as well as how knowledge cartographies communicate complex information and knowledge.

In this section, we summarize the most recent works which stress the importance of knowledge cartography in healthcare and its benefits.

(Stroetmann and Aisenbrey, 2012) propose a systematic knowledge management approach of Siemens Healthcare to facilitate access to reliable, relevant medical information with adequate depth by improving knowledge creation and sharing processes in the organization. Existing and new knowledge are stored in the Clinical Knowledge Base (CKB). Any input to CKB is evaluated and commented by the medical experts and adopted to the need of the organization. For the sharing operation, Siemens Healthcare implements push-pull strategies which are designed to meet the needs of the organization. The pull services (self-service) contribute and retrieve knowledge as and when one’s need it whereas push services (facilitate knowledge transfer) are driven by the need of the organization. The CKB identifies the medical knowledge extracted from a long career of Siemens with the experts, diseases and patients. This knowledge can be shared, transferred, organized and captured through the organization.

(Panahi and al., 2012) examine the contributions of social media to facilitate tacit knowledge sharing among physicians. It is a tacit knowledge identification and localization method. A deep analysis is undertaken proving that most of physicians share their tacit knowledge, experience and know-how among social media in forms of tips and tricks, personal clinical opinions, day-to-day clinical experiences and lessons learned, demonstrating clinical skills through videos, best practices, writing about unusual cases, developing discussions around particular cases, or asking clinical questions. This can let physicians easily identify tacit knowledge embedded in their mind on the one hand and improve the knowledge transfer, sharing and internalization. The identified
contributions of social media for tacit knowledge sharing are resumed especially in the ability to socialize online, best practices demonstration, networking with colleagues, interactive story-telling, increasing visibility of information, openness, trust and archiving articulated knowledge.

Brahmi et al. (2013) propose a new mapping approach based on the Boolean modeling of critical domain knowledge and on the use of different data sources via the data mining technique in order to improve the process of acquiring knowledge explicitly. The result of the mapping of critical knowledge is refined through a symbolic automatic learning process graph-based induction for know-how map improvement.

(Berkani and Chikh, 2012) propose a Semantic Based Approach for Knowledge Capitalization in Communities of Practice of E-Learning (CoP) which can be applied in the medical field (the community of practice of E-learning can represent the staff of healthcare teachers and apprentices or trainers: the learning teacher-trainee). CoP are groups of people who share a concern, a set of problems, or a passion about a topic, and who deepen their knowledge and expertise in this area by interacting on an ongoing basis. The capitalization operation is based on an ontology-based framework structured into three layers: (i) the ontology layer, (ii) the semantic annotation layer, and (iii) the asset layer. The framework provides a common vocabulary within a CoP to enable a shared understanding between its members, a semantic support to annotate its knowledge assets facilitating their retrieval and reuse, and a means of storage and indexing its different assets.

The works presented in this section stress the importance of medical knowledge that is why most of healthcare organizations draw attention to well identify and locate this knowledge. Medical knowledge identification can affect explicit knowledge as well as tacit knowledge. The first type of knowledge is easily acquired and identified but the second type is difficult to identify, manipulate and manage. That’s why the focus should be on tacit knowledge because healthcare professionals’ tacit knowledge is the most valuable source of their experiential know-how acquired in critical situations of patient management. This knowledge is increasing in order to select the latest news in medicine, use innovation process and products to solve problems and improve the care quality. In fact, the process of healthcare innovation gives birth to a worthwhile amount of explicit and tacit knowledge (Omachonu and Einspruch, 2010). This amount must be capitalized in order to choose the most important and crucial knowledge which are still not validated. The different methodologies proposed and already mentioned above do not clarify how knowledge identification can be applied on healthcare and do not distinguish between knowledge related to the action or related to its description. For these reasons, we conduct a conceptual analysis of the knowledge concept to better describe and characterize knowledge.

3. Conceptual analysis of knowledge

Knowledge is an abstract notion discussed in different disciplines. Many knowledge definitions are proposed in the literature, but it is difficult to attribute a unique and consensual definition to knowledge while taking into account the different concepts related to it and its use domain. According to Burkhard (2005), the need for knowledge in organizations restricts its definition. If the organization’s objective is to ensure a given solution’s storage, then knowledge is defined as an object. While the organization’s objective is the optimization of the knowledge processes such as identification, creation, or sharing, knowledge is defined as a process. In this paper, knowledge is not an object (Grundstein, 2009). It is related and mobilized in human action (Grundstein, 2009). It is related to the organization’s processes (Nonaka and Takeuchi, 1995). We partially share this point of view. In fact, some knowledge can be linked to actions (for example, knowledge related to the detection of a disease) or to descriptions (for example, knowledge related to or about a specific disease). The first type is known as Know-How and the second type is Known as Knowing-That. This first type is not taken into account in most definitions of knowledge. In an organizational context, these two types of knowledge are more important and are closely dependent. This distinction is proposed, also, in epistemology (Fantl, 2012).

3.1 Know-How

Know-How is defined as the capacity to perform an action (e.g. Know-How to drive a car) (Ryle, 1949; Lewis, 1990; Maier, 2011). The concept of capacity is defined as the ability to perform an action (Maier, 2011). We are interested mainly in intentional action which is related to intentions (e.g. driving a car is an intentional action). For Know-How, we distinguish between tacit/explicit, individual/collective and internal/external dimensions. An individual Know-How is Know-How which is borne by a human (e.g. knowing how to drive a car) whereas
Collective Know-How is Know-How which is borne by a group, i.e. collective (e.g. knowing how to play a symphony. This Know-How is held by the orchestra’s members. It is related to the action of playing symphony collectively by these members). In the organization, we distinguish between the Know-How of the organization and the organizational Know-How. Know-How of the organization is a Collective Know-How held by an organization whereas Organizational Know-How is Know-How held by an organization unit (it is a proper part of an organization and is managed by the organization on which it depends) or an individual affiliated to the organization.

An Internal Know-How is a Know-How held by an individual or a collective who is affiliated to the organization in order to perform its actions. Contrarily, External Know-How is Know-How necessary for the organization. It is held by an individual or a Collective external to the Organization (unaffiliated to the organization) in order to accomplish and perform the organization’s actions for a predetermined duration.

Tacit Know-How is Know-How « [...] rooted in action, procedures, routines, commitment, ideals, values and emotions» (Nonaka et al., 1996). It is «difficult to formalize and often time and space-specific, tacit knowledge can be acquired only through shared direct experience, such as spending time together or living in the same environment, typically a traditional apprenticeship where apprentices learn the tacit knowledge needed in their craft through hands-on experiences» (Nonaka and Toyama, 2003). For example knowing how to prepare a cake is a tacit knowledge acquired by the experience. Explicitable Know-How is a specific Tacit Know-How and represents the part of Tacit Know-How which can be stored on a physical or numerical support. Contrary to Tacit Know-How, Explicit Know-How is « [...] uttered, formulated in sentences and captured in drawings and riting» (Nonaka and Krogh, 2009). It is easily formalized, accessible and transferable.

3.2 Knowing-That

Knowing-That represents the relation between a proposition and a thinker (Stanley and Williamson, 2001). It assigns a truth value to a proposition. The predicate “S knows that P” affirms that S is an agent, while P is a proposition and the agent S knows that the proposition S is true. In general, a proposition is an assertion of a given situation, in other words, it is a type of description. Another type of description can be mentioned here is instructional description which describes a set of operations to perform, very often an action or a very specific task (to do this and then do that ...) (e.g. For the cake recipe, prepare first of all ingredients, beat then the eggs, add after that flour, mix then the different ingredients and put the cake in the oven). This type of description is a semantic content showing some process or a set of instructions to follow. By analogy with the proposition, it is possible to assign a truth value to descriptions. The assignment of a truth value to a description allows to study the certainty and the reliability of this description. The belief degrees proposed by Schwitzgebel (2014) are adopted in our work for descriptions degrees detailed below:

- 0 indicates absolute certainty of the falsity of a description
- 1 indicates absolute certainty of the truth of the description
- 0.5 indicates that the subject considered the description can be as true as false.

In general, Knowing-That is a belief state and attributes a truth value to a description. A belief or a belief state is « a propositional attitude, then, is the mental state of having some attitude, stance, take, or opinion about a proposition or about the potential state of affairs in which that proposition is true—a mental state of the sort canonically expressible in the form “S A that P”, where S picks out the individual possessing the mental state, A picks out the attitude, and P is a sentence expressing a proposition» (Schwitzgebel, 2014). A description of Knowing-That can be factual (a proposition) (e.g. the weather is nice / good today) or prescriptive (Do this, then do this and finally do this) (e.g. good practice guide, care and hygiene protocols).

4. Research design and methodology

The method of knowledge cartography that we propose is composed of three steps: (i) identifying the concepts to visualize, (ii) identifying the graphical elements and (iii) choosing the cartography technique.

4.1 Step1: Identify the concepts to visualize

This step is based on visualized concepts’ filtering in order to identify the most pertinent and relevant concepts for the organization such as crucial Know-How/Knowing-That and sensitive processes. We use, for thus, the
crucial knowledge identification method proposed by (Saad, 2005) and the sensitive processes identification method proposed by (Turki et al., 2011).

The Know-How and Knowing-That cartography allows to focus only on the Know-How and Knowing-That that can be useful for the organization. The concepts to be visualized in the Know-How and Knowing-That cartography are already identified by the COOK ontology (Know How, Knowing That, Capacity, Description) (Ghrab et al., 2016) and the COOP ontology (Action, Individual Action, Collective Action, Collective, Process Of Organization, Organization) (Turki et al., 2014). These ontologies are not detailed in this paper.

As of the Know-How and Knowing-That evaluation on a set of criteria, each Know-How and Knowing-That is classified in a decision class and characterized by a set of properties that distinguish between the explicit / tacit dimension, the internal / external dimension, the individual / collective dimension and the shared / non-shared dimension. The concepts to be mapped are often interconnected by already defined relations in the COOK and COOP ontologies:

- The Bears relation (reciprocal relation isHasBorneBy): is defined between an individual or a collective who holds the Know-How or Knowing-That.
- The relation IsThemeOf (reciprocal relation isHasForTheme): is defined between an action and a Know-How or a description and a Knowing-That.
- The IsAgentOf relation (reciprocal relation isHasForAgent): is defined between an individual or a collective and an action (which can be individual or collective).
- The relationship isAffiliatedToAt: is defined between an individual or a collective and an organization to which it belongs.

### 4.2 Step 2: Identify the graphical elements

This step allows to identify all the graphical elements which represents Know-How and Knowing-That cartography basis. The graphical elements used for mapping Know-How and Knowing-That are color and form. Other elements are the perception levels' choice and the spatial distribution of the concepts to be mapped.

#### 4.2.1 Sub step1: Choose colors

The color is used in the cartography to distinguish between different levels of organization processes (OP, TLP, SLP, FLP and sensitive process) (Turki et al., 2011), types of Know-How and Knowing-That (tacit / explicit, shared / non-shared) and decision classes (C1 for "non-crucial Know-How and Knowing-That", C2 for "Know-How and Knowing-That may be crucial" and C3 for "crucial Know-How and Knowing-That") (Ghrab et al., 2014).

The choice of colors to visualize in the cartography is not arbitrary but it is based on the meaning of each color in the psychology of color. This discipline is interested in the study of the human perception of colors and the impact of colors on human activity (Laurent, 2009). The use of color contrasts favors the implementation of certain characteristics of the concepts to be mapped. We mainly use “color contrast itself”, the “light / dark contrast”, the “hot / cold contrast”, the “complementary contrast”, the “simultaneous contrast”, “quality contrast” and “quantity contrast”).

For Know-How and Knowing-That, the red color is used to refer the decision class C3 ("crucial Know-How and Knowing-That") for which Know-How and Knowing-That are crucial. This color highlights the importance of Know-How and Knowing-That. The green color is used to designate Know-How and Knowing-That belonging to the decision class C2 which refers to Know-How and Knowing-That may be crucial. Blue color is used to denote Know-How and Knowing-That belonging to the decision class C1. Aside colors, we use also numbers to prioritize the three decision classes. A decreasing preference scale is used. Number 1 refers the highest priority decision class (C3). Number 2 refers the decision class C2 and number 3 refers the decision class C1. This twinning between color and number gives a more meaningful view of the decision classes (C1, C2, C3) representation. For the distinction between processes, we mainly used five colors. Pink color denotes an OP process. Dark color refers to a sensitive process to show its importance. The blue color refers to a TLP process. The green color refers to an SLP process. The light yellow color refers to a FLP process (Table 1). The OP represents an elementary process which is not composed of other processes. The TLP and SLP can be composed of finite number of process. The FLP corresponds to an organizational objective (Turki et al., 2011).
Table 1: List of visual variables used for concepts’ characterization

<table>
<thead>
<tr>
<th>Color</th>
<th>Signification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tacit/unsharable Know-How</td>
<td></td>
</tr>
<tr>
<td>Tacit/sharable Know-How</td>
<td></td>
</tr>
<tr>
<td>Explicit/unsharable Know-How or Knowing-That</td>
<td></td>
</tr>
<tr>
<td>Explicit/sharable Know-How or Knowing-That</td>
<td></td>
</tr>
<tr>
<td>OP (Organizational Process) Process</td>
<td></td>
</tr>
<tr>
<td>Sensitive Process. A sensitive process is a particular OP</td>
<td></td>
</tr>
<tr>
<td>TLP (Third level Process) Process</td>
<td></td>
</tr>
<tr>
<td>SLP (Second level Process) Process</td>
<td></td>
</tr>
<tr>
<td>FLP (First level Process) Process</td>
<td></td>
</tr>
<tr>
<td>Crucial Know-How or Knowing-That (belongs to decision class CL3)</td>
<td></td>
</tr>
<tr>
<td>Likely Crucial Know-How or Knowing-That (belongs to decision class CL2)</td>
<td></td>
</tr>
<tr>
<td>Non Crucial Know-How or Knowing-That (belongs to decision class CL1)</td>
<td></td>
</tr>
</tbody>
</table>

Since we work in a multicriteria decision-making context, several characteristics must be taken into account for the characterization and evaluation of Know-How and Knowing-That.

The tacit/explicit and shared/non-shared dimensions are combined and represented by a codecolor according to the typology of the SECI model (Socialization, Externalization, Combination and Internalization) (Nonaka, 1994).

As we have already mentioned, Know-How can be tacit or explicit and Knowing-That is explicit. Indeed, the colors pink and yellow are valid only for Know-How. The light pink color refers to unspoken tacit Know-How. The yellow color refers to shared tacit Know-How. The blue and green colors are valid for both Know-How and Knowing-That. The blue color refers to Know-How or explicit Knowing-That not shared and the color green refers to Know-How or explicit Knowing-That shared. These colors are used as backgrounds for the forms attributed to Know-How (circle) and Knowing-That (ellipse). These colors are chosen so as to have a clear shade and allow the visualization of the other colors.

4.2.2 Sub step2: Choose forms

We refer to the psychology of form for the choice of forms to be used in cartography (Palmer, 1999; Auger, 2012). We attribute the circle form to Know-How and the oval form to Knowing-That. The form assigned to the process is a rectangle and the form assigned to an action is a rectangle with rounded corners.

To avoid cluttering Know-How and Knowing-That cartography, we choose not to use several forms. For the other remaining concepts to be visualized in the cartography, we assign for each concept a pictogram: paper pictogram for the documentary support concept, computer pictogram for the digital support concept, pictogram man for the actor concept, pictogram of set of individuals for the concept collective and pictogram.
company for the organization concept. The pictograms’ use at this stage makes the concepts’ visual representation more meaningful (Table 2). Some attributes may be valid for several concepts like the individual/collective dimension and the internal/external dimension.

**Table 2**: List of pictograms and forms used

<table>
<thead>
<tr>
<th>Pictogram/Form</th>
<th>Signification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Circle</td>
<td>Know-How</td>
</tr>
<tr>
<td>Oval</td>
<td>Knowing-That</td>
</tr>
<tr>
<td>Rectangle</td>
<td>Process</td>
</tr>
<tr>
<td>Rectangle with rounded corners</td>
<td>Action</td>
</tr>
<tr>
<td></td>
<td>Organization</td>
</tr>
<tr>
<td></td>
<td>Actor</td>
</tr>
<tr>
<td></td>
<td>Volunteer</td>
</tr>
<tr>
<td></td>
<td>Collective</td>
</tr>
<tr>
<td></td>
<td>Paper</td>
</tr>
<tr>
<td></td>
<td>Digital</td>
</tr>
<tr>
<td></td>
<td>Individual</td>
</tr>
<tr>
<td></td>
<td>Collective</td>
</tr>
<tr>
<td></td>
<td>External</td>
</tr>
<tr>
<td></td>
<td>Internal</td>
</tr>
</tbody>
</table>

4.2.3 **Sub step 3: Choose the concepts’ spatial distribution**

Like any cartography, it is necessary to divide the concepts to be visualized in the cartography space. The reconciliation or distance between the concepts of Know-How or Knowing-That is ensured according to a distance that we define referring to the geographical location of Know-How or Knowing-That (internal or external to the organization). Near Know-how and Knowing-That are internal to the organization, but distant Know-how and Knowing-That do not belong to the same organization. This distribution facilitates the identification of internal and external Know-how and Knowing-That for the organization.

In addition to that, we also use the FDP (Force Directed Placement) spring algorithm (Force Directed Placement) which allows to position the nodes of a graph using a force system. The FDP principle deals with the assimilation of the graph nodes to particles of the same charge and the graph arcs to springs.

For each graph, loading, adding or deleting one or more nodes, the forces are calculated according to the vertices’ position and their position evolve according to the forces which are exerted on them. At a given moment, the forces of attraction and repulsion are balanced and the graph representation becomes stable. The application of this algorithm ensures a better concepts’ visibility (Know-How, factual knowledge, processes, actions, actors, supports).

4.2.4 **Sub step 4: Choose perception’s levels**

In Know-how and Knowing-That cartography, different levels of perception have been implemented. We distinguish between three levels of perception:
Selectivity: is ensured by the visual variables color and form. It allows the easy distinction between the different concepts to be mapped (Know-how, Knowing-That, process, action, etc.).

Scheduling: is ensured by the visual variable size. It mainly concerns Know-how and Knowing-That. It is possible to have a Know-how and Knowing-That scheduling according to a criteria sub-family (vulnerability, use duration or contribution degree of the organization's objectives) or by criterion (complexity, scarcity, accessibility, etc.).

Association: is ensured by both color and form. It is sometimes necessary to make grouping to visualize Know-how and Knowing-That having common properties (in the same organization, having the same complexity, the same degree of vulnerability, etc.).

4.3 Step 3: Choose the cartography technique

The visualization technique that we adopt for Know-How and Knowing-That cartography is the graph technique. Sometimes, this technique is combined with other visualization techniques (tree technique, process-based knowledge mapping technique and functional knowledge mapping) to generate better visualization. The graphs allow easier manipulation of the concepts represented by the nodes and the relations interconnecting the nodes. The cartography technique choice is an important and delicate step. It ensures good visualization by reorganization’s concepts and relations and taking into account the users’ types of Know-How and Knowing-That cartography. Know-How and Knowing-That cartography generated must take into consideration a set of constraints: many concepts to visualize, different characteristics of the concept to visualize, several criteria used for the concept evaluation, many relations between concepts, different standards for cartography quality, available space for mapping, user expectations and mapping use scenarios.

5. Application context

Our application context is the medical field where we experiment our theoretical framework. It represents the continuity of the EGIDE/CMCU (Joint Committee of University Cooperation) project objectives. The EGIDE/CMCU project is a part of the PHC-Utique program, which started in 2010 and ended in 2013. The aim of this project is the development of a knowledge management system for crucial knowledge to improve medical and social care of disabled children. The partners of this project are MIS laboratory (Modeling, Information, System laboratory) at the University of Picardie Jules Verne, Amiens-France, MIRACL laboratory (Multimedia, Information systems and Advanced Computing laboratory) at the University of Sfax, Sfax-Tunisia and the ASHMS.

The first results of this project were published as a doctoral study (Turki, 2012). This study proposed a multicriteria method and a core ontology of organization’s processes for the identification of sensitive processes. The application context of this thesis is the ASHMS (Association of Protection of Motor Disabled of Sfax). The ASHMS is a non-profit association. Its goal is the protection of children having motor disabilities in different fields (social, medical, educational, familiar). We are particularly interested in the early care process of children having a Cerebral Palsy (IMC) (Figure 1). This process is complex that is to say it mobilizes an amount of knowledge related to different specialties (neonatology, neuro-pediatrics, physical medicine, orthopedics, physiotherapy, psychiatry and occupational therapy). Some of this knowledge is stored in databases, medical records and good practice guides. This type of knowledge is explicit. The other part, which is the most important, is embodied in the mind of healthcare professionals (doctors, healthcare technicians). In order to take collective/individual decisions and to have suitable information for the examinations of the IMC child, healthcare professionals (having the same or different specialties) communicate, share and exchange knowledge between each other.

Most healthcare professionals participating in the early care process of IMC children in the ASHMS are volunteers; most of the knowledge produced and used in this process is volatile. Other healthcare professionals are affiliated to Hospital University, medicine faculty, ASHMS or others. Some internal healthcare professionals (healthcare technicians) communicate with other external healthcare professionals (private doctor, healthcare technician, volunteer doctor) who are geographically dispersed (hospital-university, medicine faculty, other association) (Figure 1).
For these reasons, the ASHMS healthcare professionals have difficulties to acquire appropriate knowledge, identify knowledge stakeholders, communicate between healthcare professionals, share and transfer their experiences, their points of view, their knowledge in the ASHMS or with other professionals affiliated to other organizations.

Through this paper, we demonstrate the role of cartography in identifying knowledge needed for the ASHMS. The cartography proposed for the ASHMS is based on the extension of the method of Saad (2005) for identifying crucial knowledge.

Know-How and Knowing-That identified in the ASHMS will be mapped for healthcare professionals to facilitate their sharing and identification.

In this section, we highlight the role of cartographies in facilitating the visualization of Know-How and Knowing-That of the ASHMS. The Know-How and Knowing-That cartography is based on a graphical language to guide the map’s users to read and understand easily and efficiently the content of the cartography (Ghrab et al., 2017). This graphical language is based on the graphical elements already detailed in the fourth section (set of icons, colors, pictograms and pictures) (Figure 2).

We distinguish between two color-coding. The first color-coding is used to distinguish the characteristics of Know-How and Knowing-That (tacit or explicit, sharable or unsharable). The second color-coding is used to distinguish processes’ levels. In previous works, our research group distinguished between four processes’ levels (Turki et al., 2011): FLP, SLP, TLP and OP.
CK-Cartography generates different types of maps which are the process map, Know-How and Knowing-That map, personal map and ranking map. These maps provide an overview of all concepts and a detailed view at the user request. Each one of these maps has its own objective.

5.1 Process map

This map visualizes all the organization processes with its different levels (FLP, TLP, SLP, OP and sensitive process). For the achievement of this map, we mainly rely on the work of (Turki et al., 2014) related to the identification of sensitive processes. In the beginning, the process map visualizes the FLP processes mobilized in the organization (for example, the “process related to the social care of motor disabled”, the “process related to the medical care of motor disabled” and the “process related to the educative care of motor disabled”) (Figure 3). Clicking on a FLP process will display the SLP processes for the selected FLP process. The “process related to the medical care of motor disabled” visualizes on the request of the user the SLP processes like the “process related to the early care process of children having a cerebral palsy”, the “process related to the medical process of children having a myopathy”, the “process related to the clinical study of children having a cerebral palsy” and e.g. The “process related to the early care process of children having a cerebral palsy” visualizes on the request of the user the TLP processes like the “process related to the early care process of cerebral palsy children having an hemiplegia form”, the “process related to the early care process of cerebral palsy children having a paraplegia form” and etc.

The same procedure is used for other processes’ types (TLP and OP). Figure 3 shows a global view of the process map with a zoom on the “process related to the early care process of cerebral palsy children having a hemiplegia form”. This process is composed of many OP processes. For instance, "care process of IMC children in kinesitherapy (IMC having an hemiplegia)" , "care process of IMC children in occupational therapy (IMC having an hemiplegia)" , "care process of IMC children in neuropediatrics (IMC having an hemiplegia)".

Figure 3: Screenshot of the process map from one level to another finer granularity level (FLP-SLP-TLP-OP)

5.2 Know-How and Knowing-That map

This map visualizes only at the beginning, the set of Know-How and Knowing-That mobilized on a given process. Each Know-How or Knowing-That is mapped through a structure representing who holds Know-How, where it is stored and which theme it has. Clicking on a specific Know-How or Knowing-That generates a Criterion map. Its objective is the visualization of a set of criteria used for Know-How or Knowing-That evaluation and characterization. These criteria are classified into three sub-families: vulnerability, use duration and contribution degree.

Three types of Know-How and Knowing-That map are generated by the CK-Cartography: Know-How and Knowing-That map related to a specific process, Know-How and Knowing-That map for Know-How/ Knowing-That characterization and Know-How and Knowing-That map for Know-How/ Knowing-That properties (actors, storage support).

Clicking on the “care process of IMC children in neuropediatrics (IMC having an hemiplegia)” of the process map (Figure 4) allows to display the list of Know-How and Knowing-That mobilized in this process.
For example, clicking on the “Know How to detect hypertonia and hypotonia” allows to display a more specific view (Figure 4).

Figure 4: Screenshot of the Know-How and Knowing-That map related to "Knowing how to evaluate spontaneous motor skills"

The circle which represents this Know-How, is greater than other circles, which means that this Know-How is composed of other Know-How and Knowing-That. In Figure 4, "Know how to evaluate spontaneous motor skills" is a know-how composed of "Know the development of psychomotor acquisition capacity", "Know the neurological anomaly for motor development", "Know how to find an abnormal movement" and "Know how to evaluate the axial tone".

"Know how to evaluate spontaneous motor skills" is linked to the action "evaluate spontaneous motor skills" which is an individual internal action. A tacit Know-How (pink color) is owned by the healthcare professional Doctor X.

5.3 Personnel map

The personnel map gives an idea about the actors’ individual and collective actions in an organization, the actors’ localization, the Know-How or Knowing-That mobilized in these actions and the processes in which the actors participate. It allows the administrator to identify the actors involved in the IMC children medical care (Figure 5).

Figure 5: Screenshot of the personnel map
These actors (individuals or groups) can be internal to the organization (affiliated to the ASHMS) or external. Most of the actors involved in medical care are volunteers and are affiliated to other organizations (Habib Bourguiba University Hospital or Faculty of Medicine) or to the doctor’s surgery. The distinction between employers in the ASHMS, the healthcare professionals’ volunteers or others external actors or collective is ensured by the graphical element already detailed. Each actor type is visualized by a specific pictogram. The actor "Doctor Z" is a volunteer whereas "Doctor E" is an employee in the ASHMS.

The personnel map visualizes for each actor the organization where he is affiliated (ASHMS, CHU Habib Bourguiba, Faculty of Medicine, etc.), the actions which he can perform in such process and Know-How or Knowing-That mobilized for the action performance.

5.4 Ranking map

The purpose of this map is to rank crucial Know-How and Knowing-That between each other in order to prioritize them and classify them in equivalence classes. This map is displayed at the request of the administrator.

The ranking map is used by the administrator. Its main objective is to guide him in the decision making process. The decisions taken give priority to the highest priority Know-How (Figure 6). For the generation of this map, we use the ranking algorithm stored in the model base of K-DSS platform. This algorithm is applied to the crucial Know-How.

In Figure 6, KH1 "Knowing how to evaluate spontaneous motor skills" is the Know-How which outclasses other crucial Know-How. KH2 "Knowing how to detect an abnormal movement" and KH14 "Knowing how to evaluate the child on a neuro-cognitive plan" have the same priority.

Figure 6: Screenshot of the ranking map

6. Findings and discussion

In the ASHMS, Know-How identification is a complex and difficult task because most healthcare professionals are volunteers which can cause Know-How volatility. The informal communication, the actors’ geographical dispersion, the complexity of Know-How and Knowing-That in the medical field and the specificity of this domain require the adoption of a specific methodology to take into account these specificities and to enhance knowledge identification and sharing. Particularly, Know-How and Knowing-That cartography is used in the ASHMS to effectively identify Know-How and Knowing-That as mobilized in the ASHMS processes as well as to guide healthcare professionals to take the suitable decision for the IMC child.

Early in this project, healthcare professionals were not aware of the importance of sharing their Know-How, Knowing-That and experience with each other. This can be justified by the voluntary work of healthcare professionals and the research and scientific nature of IMC children care project. In fact, research results are still under validation and experimentation. This solution is still to be studied and validated.
Many difficulties are mobilized in the ASHMS. We cite the complexity of the early care process, the uncertainty of Know-How and Knowing-That, the difficulty in accessing Know-How and Knowing-That across the different specialties (neonatology, neuropediatry, physiotherapy) and the difficulty supporting healthcare professionals participation in the staff meeting every three months for the evaluation of IMC children health status. Taking into account these difficulties, a collective decision should be taken by healthcare professionals for each IMC child rehabilitated in the ASHMS. Two decisions can be taken: the continuity of rehabilitation or its stoppage.

Taking into account the healthcare professionals’ needs, we propose Know-How and Knowing-That cartography which is used almost by all healthcare professionals who are the users of this cartography. These users are integrated in the creation, modeling and conception of Know-How and Knowing-That Cartography. Their needs and requirements are taken into account.

The evaluation of Know-How and Knowing-That cartography is completed iteratively i.e. before, after and during the construction of the cartography. Each phase of the theoretical framework of Know-How and Knowing-That cartography is validated by healthcare professionals. Moreover, each interface is validated by them. Occasionally, healthcare professionals suggest other information in the different maps generated and a re-conception of some interfaces thanks to story-boards. Healthcare professionals propose to have graphical interfaces for which they will be guided and helped by the system during the cartography’s use. The models proposed by healthcare professionals are simple which do not contain much information and are targeted for a well-defined objective for each interface. For each phase of the design of Know-How and Knowing-That cartography, story-boards are used to validate the interfaces generated by the cartography.

7. Conclusion

Healthcare Knowledge Management is becoming more and more important in healthcare organizations because of their benefits to provide suitable information for suitable healthcare professionals and suitable patient, to facilitate healthcare services’ delivery, to enhance knowledge sharing and exchanging, to sustain competitive advantage in the digital age and to be up to date about the latest news in this field (be aware of the role of the communication means and its effects in medical field).

In this paper, we propose a Know-How and Knowing-That cartography for healthcare professionals to better identify and visualize Know-How and Knowing-That. For thus, we propose four different maps: process map, Know-How and Knowing-That map, personnel map and ranking map. The process map has for objective to identify and visualize the set of organization’s processes. The distinction between processes’ types (FLP, SLP, TLP, sensitive process) is guaranteed by the choice of colors used. It’s possible to generate a Know-How and Knowing-That map for a specific process. This map provides for its users the set of Know-How and Knowing-That mobilized in this process, its stakeholders and the support where Knowing-That is stored. The personnel map gives an overview about the organization’s employees, the users and the creators of Know-How and Knowing-That. The ranking map is designed mainly for the administrator in order to help him to take the suitable decision. This map classifies crucial Know-How and Knowing-That into equivalence classes and gives them priorities.

For building Know-How and Knowing-That cartography, we propose a methodology composed of three steps. The first step is the identification of concepts to visualize. The second step is the graphical elements identification like forms, colors, perception’s levels and spatial distribution of concepts. The third step is the choice of the cartography technique. In this paper, the cartography technique used is the graph.

Know-How and Knowing-That identification in the ASHMS is a complex and difficult task because of most healthcare professionals are volunteers. This can cause Know-How or Knowing-That volatility. The informal communication, the actors’ geographical dispersion, the complexity of Know-How and Knowing-That in the
medical field and the specificity of this domain requires the adoption of a specific methodology to take into account these specificities and to enhance knowledge identification and sharing. Particularly, Know-How and Knowing-That cartography is used in the ASHMS to effectively identify Know-How and Knowing-That mobilized in the ASHMS processes as well as to guide healthcare professionals to take the suitable decision for the IMC child.

The main graphical elements used for Know-How and Knowing-That cartography are color, form, perception’s levels and spatial distribution. These graphical elements are named static visual variables. There is another type of visual variable known as dynamic visual variables which are used to highlight the concept dynamic aspect.

In future works, we hope to integrate dynamic visual variables in our Know-How and Knowing-That cartography in order to study the duration of the use of Know-How and Knowing-That and their evolution in the organization.

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Editorial for the Special Issue (Volume 16 Issue 2) on Knowledge Management and Intellectual Capital Measurement Practices in Organizations. What, how and why?

This Special Issue is dedicated to Knowledge Management (KM) and Intellectual Capital (IC) Measurement Practices in Organizations. The measuring and reporting of KM practices and IC have been at the core of scholarly debate for decades. Systematic research flourished at the beginning of the nineties following the ideal of improving company performance and competitive advantage through the measurement, management, and reporting of IC (Edvinsson and Malone, 1997; Stewart, 1997; Sveiby, 1997). However, despite the great interest shown in theory, the benefits attributed to measuring and reporting IC and knowledge are not fully recognized in practice, thus leading to a call for more rigorous and performative research (Mouritsen, 2006; Dumay, 2012; Guthrie et al., 2012). Adopting a performative approach helps bridge the gap between theory and practice by studying the management of IC and knowledge “in action”, inside organizations, to understand how knowledge resources such as people, processes and relationships are actually mobilized (Mouritsen et al., 2001a and 2001b; Mouritsen and Larsen, 2005) and thus better to understand how these resources interact in order to create value (Cuganesan, 2005).

Responding to this situation, the aim of this Special Issue is to contribute to bridging the gap between theory and practice. To achieve this aim, the two guest editors invited submissions from both academics and practitioners, as well as jointly written ones, to address these concerns. Submissions that featured case-based research on KM and IC in practice were specifically encouraged. The guest editors also encouraged submissions adopting different theoretical lenses to research methods for managing, measuring and reporting KM and IC and the gap between theory and praxis.

Eight papers form the basis of the special issue; the authors of these papers are located in different countries such as Denmark, Finland, Germany, Norway, Turkey, UK, and the USA, and applied different lenses and methods to study their respective topics.

The article presented by Bjarne Christensen, entitled “The Process of Creating Value with Intellectual Capital Practice as an Intangible Asset in Communities of Practice in the SME: an Empirical Case Study”, explores how IC is practiced and how it is related to value in the context of a small and medium-sized enterprise (SME). His findings suggest that a small firm can create value by integrating intangible knowing about end consumers in the practice of producing tangible outputs.

While Darin Freeburg in his paper “Identifying Layers of Intellectual Capital by Analyzing Unique Contexts” aimed at validating the traditional classifications of IC. Moreover, the author was interested in introducing contextual elements that could possibly add to what is known about IC. He also discovered further nuances in IC liabilities. Victoria Konovalenko Slettli, Anatoli Bourseistrov and Kjell Grønhaug offer, in their contribution “Constructing Accountability for Intellectual Capital in Accountability Settings: Coupling of Spaces and Logics”, a framework of accountability spaces and logics which can may act as an alternative for companies that have not adopted IC reporting, but would like to provide stakeholders with information concerning IC. By focusing on SMEs from the UK and Thailand, Chayaruk Thanee Tikakul and Avril Thomson, in their paper “International Lessons in Knowledge Management: A Study of Western & Eastern Manufacturing SMEs”, were interested in gaining a better understanding of current international Knowledge Management practices of these companies and how these might be influenced by culture and nationality. By highlighting the similarities and differences the authors provide some potential for learning and improvement with regard to SME KM practices. The authors Tugberk Kaya and Burak Erkut assessed in their paper: The Tacit Knowledge Capacity of Lecturers: a Cross-Country Comparison, the Tacit Knowledge Capacity (TKC) of faculty members in Germany and North Cyprus. Additionally, they determined the role of cultural context and its influence on the TKC of the profession of academic work. Based on the findings, the authors recommend universities to invest in social media platforms to increase the tacit knowledge accumulation of lecturers. Milla Ratia in her article, entitled “Intellectual Capital and BI tools in Private Healthcare Value Creation”, examined the role of IC dimensions, and more specifically, structural (data) and human capital (competences), as well as utilisation of BI tools in...
data-driven value creation in the private healthcare sector in Finland. The paper underlines the importance of different data source utilizations, especially combining internal and external data sources, along with their potential to create value.

Sahar Ghrab, Ines Saad, Gilles Kassel, and Faiez Gargouri, in their study which takes place in a healthcare organization, show how the construction and use of a specific tool of Knowledge Management, a Know-How, and Knowing-That cartography, can be used to reach several objectives: knowledge identification, sharing, representation, and visualization. The authors highlight that this favours the effective delivery of healthcare services, improves communication between healthcare professionals and guides healthcare professionals to take the suitable decision.

Burcu Balaban-Ökten and Selin Gundes, in turn, investigate the implementation of knowledge management (KM) approaches in the construction sector. The paper analyses KM needs and challenges using data from semi-structured interviews of twenty-eight micro, small and medium Architecture, Engineering and Construction firms (AEC). Findings show that the problems of converting tacit into explicit knowledge increase when passing from small to medium companies, while micro companies do not experience particular problems with tacit knowledge considering that the owner usually has complete control over the business. The paper has also a prescriptive aim since it offers recommendations which vary according to the firm size (and related knowledge problems).

This Special Issue shows that far from being a static area of research, the IC and KM discourse still show a very dynamic research parabola which spans different sectors, from industrial to service ones; different company dimensions, from micro to big; different dimensions, human, relational and structural. The eight papers also permit the identification of some areas still open to research and which deserve attention: IC liabilities, accountability spaces alternative to IC reporting; the influence of culture and nationality on KM and IC practices; and the influence of company size on the KM and IC problems a company has to confront. Finally, this Special Issue also demonstrates how practice-based research and qualitative methods help bridge the gap between theory and practice by offering very rich data which permit the gaining of insights into the dynamics of IC and KM in companies, and highlight aspects, problems and formulate recommendations which may enrich not only our knowledge but also the management of IC and knowledge.

The guest editors hope that this special issue will encourage and motivate researchers and practitioners alike to approach the opportunities ahead for further developing an exciting and relevant topic.

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Maria Serena Chiucchi and Susanne Durst
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