AN EXPLORATION OF KNOWLEDGE MANAGEMENT ACTIVITIES IN MULTIDISCIPLINARY SERVICE DESIGN ORGANIZATIONS

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ABSTRACT

This study aims at revising the history of knowledge management in service design organizations to discover what sources, technologies, tools, and users have been used and how knowledge management may thus help to improve consultants' performance. Also, this study sheds light on the importance of decomposing knowledge (knowledge-leveling being said in this article) before tackling knowledge management. Moreover, this study provides a real case study investigation of knowledge management in a service design organization. Through this investigation, the authors propose their knowledge-leveling classification model and how knowledge management activities satisfy each class. Thus, the authors showcase the essentiality of knowledge leveling in knowledge management.

Keywords: Knowledge management, Service design, Information management, Case study

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1 KNOWLEDGE MANAGEMENT AND SERVICE DESIGN ORGANIZATIONS

With the global technological growth in organizations, transforming data into information and knowledge plays a more significant role in innovating and leading the market's competition. Tangible sources are vital to an organization's life. On the other hand, intangible sources, such as knowledge and experience, provide innovation, creativity, and better decision-making. Moreover, nowadays, expertise is more accessible, knowledge and experience accumulate effortlessly, and data is stored more effectively. Therefore extracting knowledge – often called intellectual capital (Sarvary, 1999) – has become a vital asset to any business firm (Mas-Machuca and Martínez Costa, 2012). Knowledge management captures, shares, disseminates, and responds to the existing knowledge in an organization (Mas-Machuca and Martínez Costa, 2012) and is thus an ideal solution for intellectual capital management.

It is important to note that knowledge management activities are not directly related to business income or do not provide cost-efficiency directly. However, taking advantage of knowledge as a vital resource creates an opportunity to improve organizational performance in other processes (Darroch, 2005). Knowledge management tries to enhance know-how (or savoir-faire) in an organization by capitalizing on knowledge. As a result, the company may achieve better individual or organizational performance by enhancing personal or organizational competency (Martinsons et al., 2017; Tsai, 2016; Wu et al., 2012). However, knowledge and experience should not be seen as one-dimensional, which means that various types of knowledge, such as theoretical and practical, serve different objectives. Thus, it will be essential to consider this fact while tackling a knowledge management problem.

A service design organization, such as a consulting company, is a knowledge seller by nature (Apostolou and Mentzas, 1999; Dunford, 2000; Mas-Machuca and Martínez Costa, 2012; Sarvary, 1999) and is often called a knowledge-intensive organization (Manescau, 2022). Organizations prefer to focus on their core business activity in the competitive professional market and outsource other business processes to a service design organization to reduce expenses and improve performance in the market. Service design organizations thus help companies by taking up a pivotal yet secondary role in their business processes, such as improvements in professionalism or better strategic and operational articulation of complex systems and processes (Putri, 2021). Therefore, service design organizations' experience and knowledge can significantly benefit these companies (Mas-Machuca and Martínez Costa, 2012; Putri, 2021; Sarvary, 1999). Moreover, recognizing clients' needs concerning their industry sector is the critical task of a service design organization that makes them unique in the market (Sarvary, 1999). In this way, acquiring and sharing experience and knowledge inside a service design organization is essential to keep them alive in the market. Also, capturing and sharing knowledge among the company, especially with the R&D (research & development) department, makes service design companies more innovative (Wadhera, 2022).

A service design company's experience and knowledge come from its consultants' projects and missions (Mas-Machuca and Martínez Costa, 2012). Accessing these experiences and knowledge could be challenging in service design organizations because they are stored in consultants' brains and documents. Moreover, as the authors mentioned earlier, these intangible assets (knowledge and experiences) are generated complex. Thus, there should be a classification or leveling to manage these assets better. Therefore, a question comes to ask:

"How to better classify peoples' knowledge within a service design organization to address them to different knowledge management (KM) activities?"

In light of these arguments, the following study focuses on the literature on knowledge management in service design organizations. It sheds light on KM resources, techniques, technologies, tools, users, and critical issues concerning previous scientific cases of KM in service design organizations. Ultimately, the authors aim to investigate an actual case study of a multidisciplinary service design organization to provide a comparison. Therefore, in the following section, first, the authors discusse a brief argument about different aspects. These arguments are about data collection to design the knowledge management system, knowledge resources to feed the knowledge management system, different techniques or knowledge practices, technologies and tools, and users of knowledge management. Also, the section discusses critical issues in knowledge management. In the third section, the authors describe the case study and discuss the methodology used to explore facts in the

case study. In the fourth section, the authors demonstrate the result of the study, and a proposition for the classification of knowledge within service design organizations appeared in section five. Finally, the last section concludes the article.

2 LITERATURE REVIEW

Given the multidisciplinary nature of the subject, review articles in the domains of knowledge management, knowledge management and consultancy, e-business, and information management were thus studied. Knowledge management studies became popular in the 1990s when several studies showed their value (Bukowitz and Williams, 2000; Choo, 1996; Davenport and Prusak, 1998; Nonaka, 1994; Nonaka and Takeuchi, 1995; Wiig, 1994; Wiig et al., 1997; Zack, 1999). With this growth and attention to the subject, review studies started summarizing some points of view for researchers, especially in service design organizations. For instance, in general knowledge management, Dunford (2000) reviewed studies in knowledge management and claimed that knowledge acquisition and application processes correlate strongly with a firm's capacity to innovate. In 1999, Sarvary (1999) examined centralized and decentralized methods in service design organizations to understand KM's impact on competitiveness. Apostolou and Mentzas (1999) analyzed ten articles (about implementing KM in service design organizations) from the literature to compare the alignment of people, technologies, business strategies, and goals related to implementing a KM system.

More recently, Mahmoud et al. (2015) reviewed previous cases of implementing knowledge management systems to increase organizational performance and adapt knowledge management strategies and business strategies in service design organizations to cover knowledge management in consultancy. Mazorodze and Buckley (2019) studied knowledge management in knowledge-intensive organizations to find knowledge management processes, infrastructures, and barriers in knowledge-intensive organizations.

2.1 Data collection for knowledge management systems (KMSs)

There are several approaches to collecting the most necessary information about what must be provided to employees via a knowledge management system. This step is crucial in implanting a KMS to satisfy all the objectives while bringing the sharing culture to the organization.

Based on the literature, the most common approaches are semi-structured and structured interviews, observations, and document analysis (Tseng, 2008). Nevertheless, there are other semi-popular approaches, such as participating in the organization's meeting – the one related to the KMS objectives – and distributing surveys/questionnaires between stakeholders of the KMS to extract information. Moreover, there are some creative approaches to collecting data. For instance, Vu and Le (2021) designed a basic knowledge management system as the trial version. They launched it with the help of some experts in the organization to debug and find the most necessary types of knowledge. Therefore, they understood the most valuable knowledge (or knowledge resources) practically and efficiently. Griffiths and Remenyi (2008) tried to tackle information collection by participating in several workshops and taking advantage of "Socratic Dialogue," which they believed would complement interviews.

2.2 Knowledge resources and techniques to capture knowledge

After discovering what knowledge management needs to provide for employees, knowledge engineers would discover different sources of knowledge to feed their system. According to almost every article about knowledge management, the knowledge management system tries to extract tacit knowledge from the employees. However, according to the literature, tacit knowledge, i.e., experiences, and explicit knowledge, i.e., documents and manuals, are almost identically essential to a service design organization (Tiwana, 2000).

In order to feed the knowledge management system with tacit and explicit knowledge, several knowledge engineering techniques should be applied. Based on the literature, most case studies used documents (through storing in knowledge bases) to capture explicit knowledge. For example, Tserng et al. (2016) applied document scanning and image processing to their knowledge-gathering process to obtain insights from their projects' documents.

The story about tacit knowledge is different. Several well-known approaches have been used to extract knowledge, such as lessons learned, best practices (knowledge practices) (Levallet and Chan, 2018), face-to-face communications, and communities of practices (CoP) (Lesser and Storck, 2001).

2.3 Tools and technologies

In the early years of knowledge management in service design organizations, providing a filing system or document repository was a common practice. However, taking advantage of email systems, lotus notes, and groupware was recurrent (Robertson and O'Malley Hammersley, 2000). The literature review shows that developing a knowledge repository (knowledge base) using electronic documents has become a common practice in service design companies ever since the emergence of information technologies like the internet and intranets, as well as the standardization of business machines like PCs and electronic databases (Gde Agung, 2014).

Some cases applied different software (internal or online) to their repository to make it more user-friendly and accessible to their consultants (Bell et al., 2016; Cheuk and Dervin, 2011; Wethyavivorn and Teerajetgul, 2020). Moreover, in several cases after the year 2005, social media and crowdsourcing were used to help develop a more user-friendly and accessible knowledge management system (Gde Agung, 2014; O'Leary, 2015; Powell and Ambrosini, 2017; Vu and Le, 2021).

2.4 Users

There are a variety of users for a knowledge management system. It depends on different criteria, for example, the type of knowledge provided in the system. Based on the literature review, consultants are the primary users of knowledge management systems.

This fact gives insights into the importance of engaging consultants in the very first steps before designing the KMS. The knowledge management system should provide any kind of knowledge that consultants would need, not managers or anyone else. Therefore, in the first step, data collection, to design a KMS, consultants should give information about what is needed to be provided and the objective of the KMS (Tiwana, 2000).

2.5 Critical issues

Knowledge management may seem straightforward or basic; however, the knowledge management system will likely fail in many cases. Ambos and Schlegelmilch (2009) pointed out this fact in their study:

"95 percent of the respondents said they would rather contact people they know over the phone than use the knowledge management systems."

A knowledge management system that is not being used is a failed system. The literature review shows several critical issues are reasons for a failed knowledge system. Cultural issues are the main pain points in any knowledge management system (Lam, 2005; Nakash and Bouhnik, 2020). Several cases noted different cultural problems after implementing the KM system (Bongku and Kurniawan, 2019; Gde Agung, 2014; Ghosh et al., 2012; Lam, 2005; O'Leary, 2019; Powell and Ambrosini, 2017; Vu and Le, 2021). Trust, consultant competition, career advancement, and job security are the main factors in knowledge management (sharing) culture. These factors are found in the literature review, and they cause consultants' unwillingness to share knowledge or get involved with the system.

2.6 Knowledge classification (decomposition)

The authors studied knowledge management state-of-the-art in service design firms and provided insights about KM activities, tools, and issues in the literature. As the authors mentioned in the introduction of this article, knowledge is complex and thus should be classified to enhance KMSs' performance. Also, the authors believe that classifying knowledge could solve many of the critical issues mentioned in the last sub-section due to providing more accurate knowledge to consultants.

Knowledge classification is an act of categorizing basic knowledge into different classes. Knowledge is a complex asset, evident in different ways and in nature. In the literature are some examples of decomposing knowledge (or, better say, classifying knowledge). However, they have never tried adopting those classifications on KM activities and tools.

Nonaka and Takeuchi (1995) propose one of the most famous classifications. They offered to classify knowledge as tacit and explicit. Furthermore, they proposed a knowledge creation model based on this classification but not adopting it to KM practices. Other classifications, such as theoretical and practical knowledge, have been referred to in articles (Van de Ven and Johnson, 2006). Although, they, too, have never been used to enhance KM practices' performance. In this article, first, the

authors explore KM practices and tools in a case study. Then they propose a new classification that leads this article to demonstrate the adoption of this classification into KM practices and tools.

3   AN EXPLORATION (A CASE STUDY OF A MULTIDISCIPLINARY CONSULTING FIRM)

3.1 Description of case study

This study continues its investigation of knowledge management in consulting firms by studying a real-case multidisciplinary consulting firm. ABC is a small-sized (over 200 employees) french multidisciplinary consulting firm based in Paris with over 20 years of experience in finance and management consultancy. Nowadays, ABC provides business intelligence and data-driven services, such as business and data analysis solutions, to its clients. ABC's clients are varied in different industries, such as banking, insurance, and retail. Thus, ABC is counted as a multidisciplinary consulting firm due to its variety of services and clients.

3.2 Methodology

The authors held several interviews with all possible collaborators in this consulting firm to extract insights about the current knowledge management activities and explore weak points of the organization to capture and share knowledge. The authors held interviews in two primary epochs (each interview took an hour, approximately). First, the authors interviewed twelve consultants, including juniors and seniors. Then, the authors interviewed ten collaborators, including business leaders, community leaders, and managers. All interviews were structured and for a duration of one hour each - either consultants or other leaders.

The goal of interviewing consultants was: first, to engage them in knowledge management system design and transfer the sense-of-belonging feeling to them; second, to better be able to judge knowledge management activities within the organization; and third, to better understand their pain points - what knowledge they want to be provided in the knowledge management system.

On the other hand, interviewing other collaborators (stakeholders) gave the authors a rational perspective of how strategy alignment could be done in a multidisciplinary consulting firm. Moreover, having two different perspectives (consultants and other stakeholders) helped the authors better analyze the ideal activities that the organization wants and the reality happening.

The authors also observed all the consultants' activities from the day they entered the organization to the last day. As a result, the authors derived the consultant's lifecycle in a consulting firm. Thus, all the interviews were designed in several phases based on the consultant's lifecycle (see Figure 1). The authors observed that once the organization hires a consultant, they send the consultant to an intermission step. In this step, consultants try to participate in internal projects, such as R&D projects, or take some training courses, such as learning a tool. Once the organization receives a demand from a client, they contact the most relevant consultant - who is in the intermission step - to the mission demanded by the client. Then, studying for the offer starts. After matching a consultant with the offer, the consultant starts being prepared for the mission step called "mission departure." In this step, the consultant contacts the client to do some interviews and exchange documents concerning the mission. If the client accepted the consultant, the consultant would start the mission shortly. When the mission is over, the consultant will return to the organization to the intermission step once again unless the consultant wants to leave the organization.
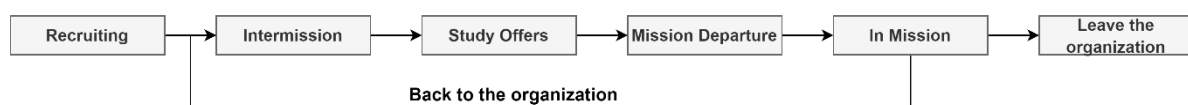

Figure 1. Consultant's lifecycle in consulting firms

The authors held all the interviews with the consultants in the intermission step. Eight of the twelve consultants interviewed by the authors had just finished their missions, and four had been recently hired. The other ten collaborators the authors interviewed were in-site employees of the organization. Table 1 gives us a piece of brief information about the interviews.

Table 1. Interviewees

Role	Year of experience	Number of interviewees
Consultant junior	< 1 year	3
Consultant junior +	> 3 years	6
Consultant senior	> 7 years	3
Business director	> 7 years	4
Commercial	> 3 years	1
Senior team leader	> 7 years	1
Human resource manager	> 7 years	1
Human resource employee	> 3 years	1
Recruitment Manager	> 7 years	1
Administration and Finance manager	> 7 years	1

During the interviews, the authors took notes concerning each question asked and recorded the interview to re-check every stored information based on the transcription. Then, the authors analyzed all interviews and extracted helpful knowledge from them. The authors bring some results of the interviews in the next section.

4   RESULT

In this section, the authors provide a quick result over interviews documents analysis followed by a proposition of knowledge management classification better to define KM activities in a multidisciplinary consulting firm. First, the authors analyzed consultants' positive and negative experiences - concerning knowledge and skills - during a mission. Therefore, the first analysis batch was devoted to the consultants who had just left their mission (eight consultants). Moreover, the authors tried to extract information about the interaction between these consultants and other collaborators in the organization during the interview analysis. Then, the authors analyzed the interviews with the other four consultants who had just joined the organization. These interviews focused on understanding consultant wishes concerning knowledge and need before entering a mission. As per the other interviews, the authors also studied the consultant's interaction during the second batch of interviews. Figure 2 explains the authors' analyzing approach to the interviews.
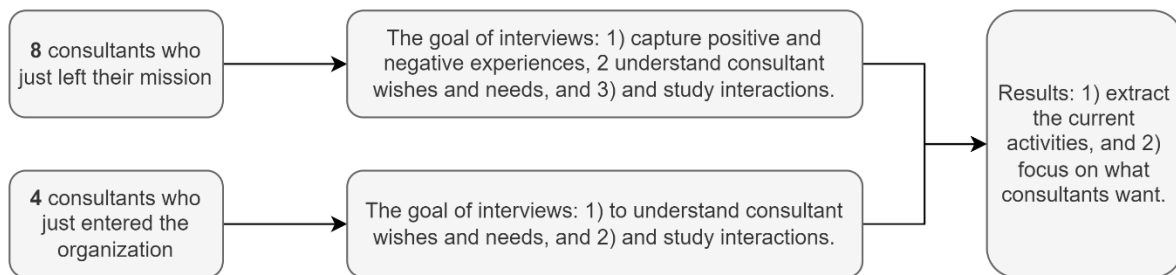

Figure 2. The authors' interviews analyzing approach

Interviews have been recorded, and also notes have been taken during these interviews. The authors then read each manuscript and searched for the requirements that the authors mentioned earlier. All the extracted insights from these manuscripts were then brought together, and the authors chose the most redundant of them as an essential insight to be considered.

4.1 Positive and negative experiences

After spending several hours with different people in the organization via interviews, some positive and negative experiences seem noteworthy. Consultants mentioned three main arguments. One positive experience that consultants mentioned very often was accessing a proper platform to find training courses anytime they wanted. One consultant told the authors:

"Having a module in the client's office to find all available training courses were useful to enhance knowledge for a particular problem."

Second, consultants constantly told the authors that they would prefer internal knowledge repositories more than just searching on the internet. "*I find the solution to my problems or questions by searching in google. However, it is much easier to find a solution once I know the person who posted the article. This advantage we have it via knowledge databases,*" another consultant mentioned.

The consultant also shed light on positive activities in the organization. For instance, some consultants mentioned that having a social media application is a better information technology to get information and knowledge once they are on their mission (out of the office). They said that they used the organization's social media application over email to catch up with the organization. Also, they were more confident and comfortable asking questions through the social application.

4.2 Consultant desires

As per the literature study by the authors, consultants are the primary users of a knowledge management system in a service design organization. Considering what they need is essential; considering what they desire to know is highly recommended, in any case. The authors asked some questions about what consultants want to know before starting their mission or even once they are on a mission. Most consultants believed a general guide about the mission was the best knowledge they could access during the first weeks of their mission. Moreover, passing some training courses related to what they will do in their mission is a practical activity. One other argument that seemed essential to the authors is:

"*I would like to interact more with other consultants during my mission. Especially once encountering a problem, I feel more comfortable if I talk to another consultant of our organization more than client's employees.*"

The authors believe this could be due to insufficiently devoted platforms to find other references in the organization. Also, communities seem to be a proper place to get consultants in touch and exchange knowledge.

5   A CLASSIFICATION OF KM ACTIVITIES

In this section, the authors propose a classification of KM activities and technologies based on their investigation. Earlier, the authors mentioned different steps in a knowledge management system from the literature review study. After completing their investigation, the authors found that to classify the KM activities better, knowledge engineers should also consider different levels of knowledge for each activity and find the best technology to capture and share that particular piece of knowledge. The following figure proposes a leveling of knowledge.
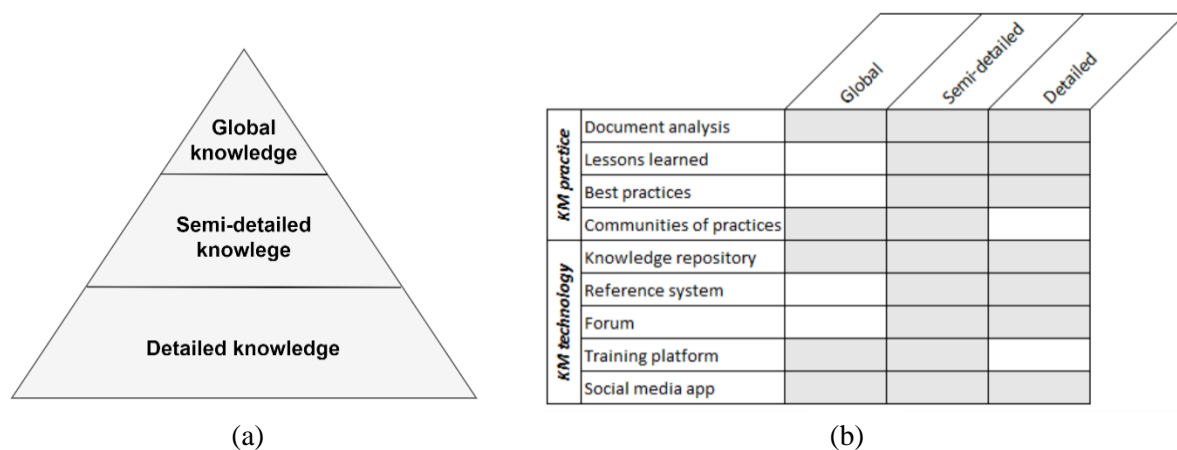

(a)   (b)

Figure 3. (a) The proposition of classification of knowledge (deepness levels of knowledge),
(b) How KM practices and technologies cover different knowledge levels

Figure 3 (a) proposes three levels of knowledge concerning how deep a needed knowledge could be. Most of the knowledge needed by consultants is classified as detailed pieces of knowledge. Detailed knowledge means a particular knowledge that a big group of consultants might not need — for instance, a particular syntax error in a programming language. This type of knowledge is seen the most, and it is impossible to share it among a community. Therefore they should be shared via a forum and as documented knowledge in knowledge repositories or social media apps. Alternatively, they should be asked by someone with this particular experience or knowledge via reference platforms.

The second most wanted type of knowledge is called "semi-detailed knowledge." Consultants less frequently ask for this type of knowledge. Applying a particular function in excel sheets would be proper as an example of this type of knowledge. This type could be shared through all activities via all possible platforms. Consultants can ask someone to help them or share this question in a community. This type can be found in documents stored in a knowledge repository or shared by a teacher during a training course.

Last but not least, global type of knowledge. The authors considered global knowledge as the shallowest piece of knowledge. For instance, knowing Python programming language is a global knowledge. Therefore, this knowledge can be found in stored documents, such as books, through knowledge repositories or social media apps, or can be reached in a training course or community.

Figure 3 (b) demonstrates how KM practices and technologies can provide different types of knowledge to consultants. As a result of the interviews, the authors verify that the KM activities extracted from the literature study are sufficient for a service design organization. However, the authors believe that applying knowledge leveling will help the organization manage its KM activities better and fulfill all consultants' needs. As demonstrated in Figure 3 (b), not every KM activity of technology will transfer knowledge completely. For instance, communities of practices are a perfect place to share global or semi-detailed knowledge. They are not sufficient for detailed knowledge, however. This figure will help designers to choose their KM activities and technologies more optimally.

To conclude the result section, the authors believe that by using the proposed classification (leveling) of knowledge, consulting firms (even multidisciplinary consulting firms) can address and cover every KM activity and technology used in the organization. Thus, the KM system can be better designed and set up in the organization.

6   CONCLUSION

This study aims to study the literature on activities and technologies of knowledge management in consulting firms and explore a case study of a multidisciplinary consulting firm (a complex system of knowledge flow) in order to propose a classification of knowledge addressed to KM activities and technologies. Therefore, the authors discuss their exploration methodologies (interviewing different organizational actors) and propose a knowledge leveling. Furthermore, the authors address how this classification can cover the most discussed KM activities and technologies. As a result, the authors believe that consulting firms, either multidisciplinary and complex or most straightforward, can enhance their KM system's performance with this classification.

Based on the authors' observation, exploration, and research, the term "knowledge" does not have the same deepness level in every situation, and all KM activities can not eventually address them. Therefore, in a complex situation such as a multidisciplinary consulting firm, the KM system would not be optimized even if the complete KM system is set up without a sound understanding of knowledge levels.

Finally, the authors believe this study could go further and study the detailed activities and technologies considering the proposed classification of knowledge. For instance, the authors mentioned that lessons learned could answer both semi-detailed and detailed types of knowledge. However, the authors did not mention what kind of lesson learned will address semi-detailed knowledge and what kind of lesson learned will address detailed knowledge.

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