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Information and Communication Technology (ICTs) and Organizational Culture for Knowledge Sharing Strategy: Case Study of a Center for Continuing Education

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The role of knowledge management is essential for any organization today. This study analyzes the knowledge value chain of a center for continuing education offering skill development related short courses and training for adult learners. Besides, this study analyzes how the Center can improve sustainability in terms of efficiency and capacity building by implementing effective knowledge sharing strategies utilizing information and communication technologies (ICT) and the organizational cultures. The case study methodology was used to study the factors that influence knowledge sharing in an academic institute. Organizational factors that influence the knowledge management process in the organization are studied. Knowledge sharing depends on the type of knowledge, motivation, and opportunity to share. The results show that both knowledge management systems and a conducive organizational culture are needed to implement a knowledge-sharing strategy effectively. Thus, the study focuses on the emergent approach (focusing on interpersonal dynamics and the nature of their daily tasks) and engineering or management approach (focusing on the infrastructure of knowledge-sharing). This qualitative study shows how systematic and organized knowledge sharing can help an organization offers continuing education services effectively and survive in its competitive marketplace. This study analyzes the knowledge value chain of a center for continuing education. How can knowledge management strategies help it to improve organizational sustainability in terms of efficiency and capacity? Knowledge management systems (tools and infrastructure) and conducive

organizational culture are needed. Systematic, organized knowledge management improves competitive survival.

Key words: *Knowledge Management, Knowledge Sharing, Information and Communication Technology (ICT), Knowledge Transfer, Adult education, Continuing education center.*

INTRODUCTION

Knowledge management is increasingly considered an important strategy to improve productivity, competitiveness, and organizational performance through efficient use of existing intangible resources hidden in the organization (Wiig, 1997; Haas and Hansen, 2007). The question is no longer *whether* to manage organizational knowledge but *how* to maximize the utilization of available resources to achieve higher performance. Universities and research institutes constitute social, academic communities that play a vital role in creating and transmitting scientific knowledge, which is the fundamental source and driver of societal progress as well as development through improving the innovation eco-system (Tian et al., 2009; Rodríguez-Soler and Brunet Icart, 2017). There is little research on knowledge sharing in an academic organization for adult learners offering job market demand-oriented short courses and training, such as a continuing education center. The increased demand for new skills-oriented short courses and training motivated us to study how the traditional Center for continuing education can improve their performance through knowledge sharing utilizing ICTs and organizational soft management approaches. The novelty of the research theme and multi-stage analysis requires an in-depth analysis of various functions and their collaboration and sharing of knowledge.

The case study method was undertaken to explore knowledge sharing within the organization and with third parties. The traditional centers for continuing education (CFOO[1]) need to improve their performance to face the increasing competition from all kinds of Massive open online course (MOOC) and offline providers of similar services, such as skills development, training, and short courses for professional development. Thus, improving the knowledge-sharing process in the academic organization would have both a significant social impact and improved organizational performance. Knowledge sharing refers to the provision of task information and know-how to help others and to collaborate with others to solve problems, develop new ideas, or implement policies or procedures (Wang and Noe, 2010, p. 117). We study the case of the CFOO, an independent organ within a university that provides professional short courses, customized training for companies, and business-oriented courses. Operating in a context of globalization, extreme competition, and constant innovation, a knowledge-based economy requires an increasingly specialized workforce. It looks to CFOOs for innovative training and skills development services with a considerable demand in the market. The CFOO can cope with the increasing demands by focusing on managing its implicit

[1] French Acronym.

and explicit knowledge. Based on the analysis of an existing unexploited knowledge reservoir, this study aims to offer systematic and organized use of organizational knowledge for survival in a competitive environment. An organization needs to understand how knowledge is created, shared, and used within the organization to capitalize on the value of knowledge. This study focuses on how knowledge sharing takes place and can be improved at a basic level, such as among employees. This study explores how internal knowledge users can collaborate and share knowledge to enhance their service delivery to prospective clients. The study highlights the use of information and communication technology (ICT), making it flexible in communicating and coordinating among the employees and managers to share knowledge in the organization. Knowledge management is a multidimensional phenomenon that requires a thorough approach to get to the heart of the topic and understand exactly what is happening in an academic organization's knowledge management. This led us to choose the case methodology to study the CFOO offering short-term training to adult customers already in the labor market. The case study is an interesting method, especially when the question of the study is requested in the form of what is happening (Bouma and Ling, 2006) and *how* to deal with it? Indeed, the case study approach allows us to exploit the advantages of the deductive process and those of the inductive method for the production of knowledge.

The rest of the paper is organized as follows: Section 2 presents a literature review about knowledge sharing and an overview of the CFOO in our case study. Sections 3 and 4 present the research design and findings, respectively. Section 5 further discusses the case analysis findings and classifies them into four important factors concerning knowledge sharing in academic organizations. Section 6 describes the validity and reliability of this study. Finally, Section 7 contains managerial implications, and section 8 presents brief concluding remarks and directions for future research.

1. The CFOO and Knowledge Sharing

Center for continuing education can be considered as a Knowledge-intensive business organization as it provides different kinds of skilled development services to its clients. However, in an era of globalization, the rise of online providers, and massive open online courses (MOOC), the CFOO faces increasing challenges in the marketplace and needs strategies to overcome those challenges. Obective of this study aims to see how knowledge sharing and integrated information technology platform can improve the efficiency of services provided by the CFOO. Thus the approach of this study is both emergents as well as engineering. Emergent approach refers to focusing on the social dynamics between employees and the nature of their daily tasks to accomplish their duties in the organization. On the other hand, the engineering approach focuses on management interventions or infrastructure of knowledge sharing in the organization (Van den Hooff and Huysman, 2009).

2.1. Center for Continuing Education (CFOO)

This study explored knowledge management issues in an academic organization, the CFOO, offering continuing education services. The knowledge management process in this kind of public service organization is different from that of commercial organizations, predominantly the focus in the knowledge management literature. The CFOO was created in 1990 to offer short courses and training to clients already in the labor market (CFOO, 2016). The CFOO offers various short education programs and training that help professionals at work upgrade their knowledge and fill some management and science gaps in several emerging industries. The organization's main objective is to offer innovative skills development programs with increasingly high demand in today's competitive marketplace. More than 100 employees, managers, and senior executives manage this education unit and deal with several hundred prospective adult learners every month. This education center's administration is separate from other classic education programs, such as Bachelor's, Master's, or PhD degrees offered by the university[2]. The CFOO receives applications for existing short-term education programs or requests for new training programs for individuals or groups from firms. The business processes of the CFOO require collaboration and a perfect synergy between internal advisors, coordinators, and business partners. In the case of market demand for a specialized product, the decision to accept or reject a client's request requires several approvals from concerned people at different levels of the organization. This requires an effective exchange of information and complementarity among the various stakeholders. There are at least two levels of administrators who receive those requests and analyze them. In the current context, despite the integration of ICTs, knowledge-sharing and collaboration of employees in different departments and levels remain at the minimum due to both organizational structure and culture and require improvement in cooperation to improve the organization's overall productivity.

2.2. Literature Review

Proper combinations of knowledge create capabilities that lead to higher performance of an organization. With the rise of ICT utilization in organizations, knowledge management, knowledge sharing, and knowledge transfer have become more comfortable. The use of ICT improves the efficiency of knowledge utilization and gives flexibility in sharing and transferring knowledge among organizational users and external stakeholders. Nonaka et al. (2000) showed that the organization's theory based on knowledge (the knowledge-based view) suggests that an organization is a creative entity of knowledge. In this context, knowledge and the ability to create and use this knowledge capital effectively become the most essential source for creating sustainable competitive advantage. According to Nonaka et al. (2000), the efficient utilization of knowledge and distinctive competencies enable the organization to innovate in terms of products, processes, and services or make more efficient use of the organization's existing ones. Knowledge sharing is increasingly considered a useful tool for organizational

[2] For confidentiality of the organization, we do not reveal the actual name of the university and CFOO.

effectiveness (Quigley et al., 2007). Knowledge sharing among employees enhances the performance of both public and private sector organizations (Silvi and Cuganesan, 2006). However, tacit knowledge is difficult to transfer, and knowledge sharing depends on the willingness of the holder of the Knowledge (Lin et al., 2008) and explicit knowledge can be transferred/shared by both using various tools and a face-to-face interview.

An extensive body of research (Ipe, 2003; Seonghee and Boryung, 2008; Shoham and Perry, 2009) has attempted to analyze the significant factors that influence knowledge sharing. According to research on organizational culture by Samra et al. (2009) and Sultana et al. (2013), the degree of trust, honesty, and justice are the characteristics that represent the best organizational culture. A conducive culture can enable the sharing and exchange of knowledge among organizational users to flourish. Kim and Lee (2006) studied the impact of corporate culture and information technology on employee knowledge-sharing capabilities. Titi Amayah (2013) found that enablers, like social interaction, rewards, and organizational support, significantly affected knowledge sharing.

To understand how knowledge is created throughout the value chain; Landry et al. (2006) presented an interesting model in which knowledge passes through the stages of mapping/acquisition, creation/destruction, integration/transfer/replication, and destruction toward the end of the value chain, which is the innovation/performance stage (Thompson et al., 2009; Al-azad et al., 2010; Kimiagari et al., 2015). This value chain process is an essential model for understanding how the organization produces and shares knowledge. This model helps to decode elements of knowledge management. Although there are several examples in the literature of success in implementing knowledge management, organizations face significant challenges (Gold et al., 2001; Alavi et al., 2005). Challenges are found in each factor that Roy and Rivard (2005) identified as part of their integrated knowledge management model. Consequently, it is imperative to analyze each of these elements in the implementation stage of knowledge management. Many researches (Alavi and Leidner, 1999; Lin et al., 2005; Kim, 2007; Moteleb and Woodman, 2007) have described the lack of analysis of factors that might impact knowledge management organization. Ardichvili (2008) highlighted that motivational factors (personal benefits, community-based considerations, and normative considerations) affect willingness to share knowledge with others. According to Razmerita et al. (2016), significant knowledge-sharing drivers are enjoying helping others, monetary rewards, management support, change of knowledge-sharing behavior, and recognition of barriers that change behavior, lack of trust, and lack of time.

3. RESEARCH DESIGN AND METHODS

This qualitative research based on the case study method is an exploratory project. Large-scale quantitative data's unavailability led us to use the qualitative research method to understand what is happening and develop a new theoretical understanding (Glaser and Strauss, 1967; Christensen et al., 2002; Gephart, 2004). Moreover, Stuart et al. (2002) argue that the

qualitative study is for understanding and preliminary theory development and the refutation of or extension to existing concepts and models due to their rich observational capability. According to Thietart (2003), there are three types of explorative research: i) Theoretical exploration, ii) empirical exploration, and; iii) hybrid exploration. In our study, we have adopted the third approach. Hybrid exploration brings together both theories and observations. In this context, the researcher depends on the existing literature to make sense of data that can lead to new concepts and models.

Regarding data collection, for this qualitative research, we used the method of a face-to-face interview with at least two to three persons from each hierarchy level of the organization using an interview guide. Since we did not want to influence the participants, we decided to ask open-ended questions (Schuman and Presser, 1979). Open-ended questions allow collecting data on an individual's or group's perspectives, feelings, opinions, values, attitudes, and beliefs about their personal experiences and social world, in addition to factual information (Saldana, 2011). To improve the understanding of the questionnaire and to be sure that our prospective respondents understand our questionnaire, we have done a pilot test with five respondents and evaluated their responses to confirm whether they understood the questionnaire or not. The interview guide consists of open-ended questions (Annex 1 & 2) on knowledge management. The interviews were conducted in periods ranging from 90 minutes to 120 minutes and took place during November and December 2016. The employees were able to speak freely, making this method very efficient. During the interviews, we often crossed the pre-established boundary of our discussions. Thus, we have assimilated other information about the importance of knowledge management in organizational strategy and knowledge sharing within the organization. We have also collected documents of the organization where our respondents are affiliated.

Moreover, we have consulted newspapers and other publicly available documents to find related news, articles, and other documents. The multiple sources of the data helped us to establish triangulation at the data collection stage. We have also followed three stages of data analysis recommended by Creswell, (2003). The three stages are, i) data combination according to the source of the data. This stage is helpful to check collected data and decide whether there is a need for additional data; ii) Making sense of data by highlighting the broader threads of the data, and iii) coding process.

The interviews have been transcribed into an MS Word verbatim, and the content analysis was performed on both the interview verbatim and publicly available documents of the CFOO.
The collected data were coded and aggregated into categories according to their similarities and differences (Thiétart, 2007, pp. 498). We have also coded transcripts made of "other publicly available documents" collected from the focal organization and other sources. We then drew relationships between the various categories to understand better the information we had collected using QDA Miner software (version 4.0.4). We have followed the process developed by Jones and Alony, 2011).

The purpose of the content analysis was to provide knowledge and understanding of the phenomenon (Downe-Wamboldt, 1992). For Hsieh and Shannon (2005), qualitative content analysis is a research method for subjective interpretation of the text's content through a process of systematic classification of coding and identification of themes or patterns. Content analysis is a grounded theory analysis method, which enabled us to establish embedded information through the text analysis (Legros et al., 2013; Sultana et al., 2013). Eisenhardt (1989) highlighted the benefits of multiple data collection methods to provide evidence of synergy and triangulation. It is accepted that qualitative research does not always lead transparently to the conclusion (Bouma and Ling, 2006). We ensured the description and interpretation of data. We recorded the conversations and made transcriptions after each interview. This multi-method of data collection allowed us to recap the data better and triangulation among the data.

In our research, we made a significant connection between knowledge management and CFOO organizational strategy. We found that knowledge management objectives could be aligned with the objectives of the organization's strategic plan. However, to analyze this in a systematic way to assess how knowledge management influences the organization's activities, research must be pursued through the analysis of business processes.

As the organization has not adequately or systematically re-engineered business processes to improve performance using information technology, work processes remain in employees' minds (tacit) and are not adequately documented or optimized consistently and effectively. This implies, first, a lack of efficiency in terms of performance and, second, an opportunity to integrate knowledge management with business processes to improve processes themselves.

We used the six stages identified by Smith and McKeen (2003) that bring a knowledge management perspective in business process design. Concerning the organization's critical processes, the study took into account the concepts of knowledge management and its multidimensional characteristics. Besides, the study considered the views expressed by interviewees at various levels of the organization.

Teaching and skills development courses and training offered by the CFOO are based on the university's available expertise, both undergraduate and post-graduate levels. As the CFOO serves diverse client groups, its challenges are relatively high. A student who wants to continue his or her studies, an employee who desires improved skills, or an older adult interested in a specialized program is all looking for quick responses to their needs and effective training offerings. Critical processes related to the CFOO's core activities are analysis of admission application for courses or training programs and business prospects monitoring. The admission application analysis process in the current situation involves two sub-processes deployed at two different levels (see Figures 1 and 2).

A) In the first level, the admission application undergoes a preliminary analysis to determine the next level of analysis to obtain a decision. This process is managed by a reception secretary or a similar administrative assistant, a first-level knowledge management player. The first level analysts evaluate the file in terms of established rules and requirements and transmit to the next level for more rigorous analysis.

B) In the second level, the client request is analyzed in detail to decide on the planning, execution, and monitoring of training. A training consultant manages the second-level analysis process, that is, a second-level knowledge management player. The second level analysts have more discretionary power in terms of evaluation of application files.

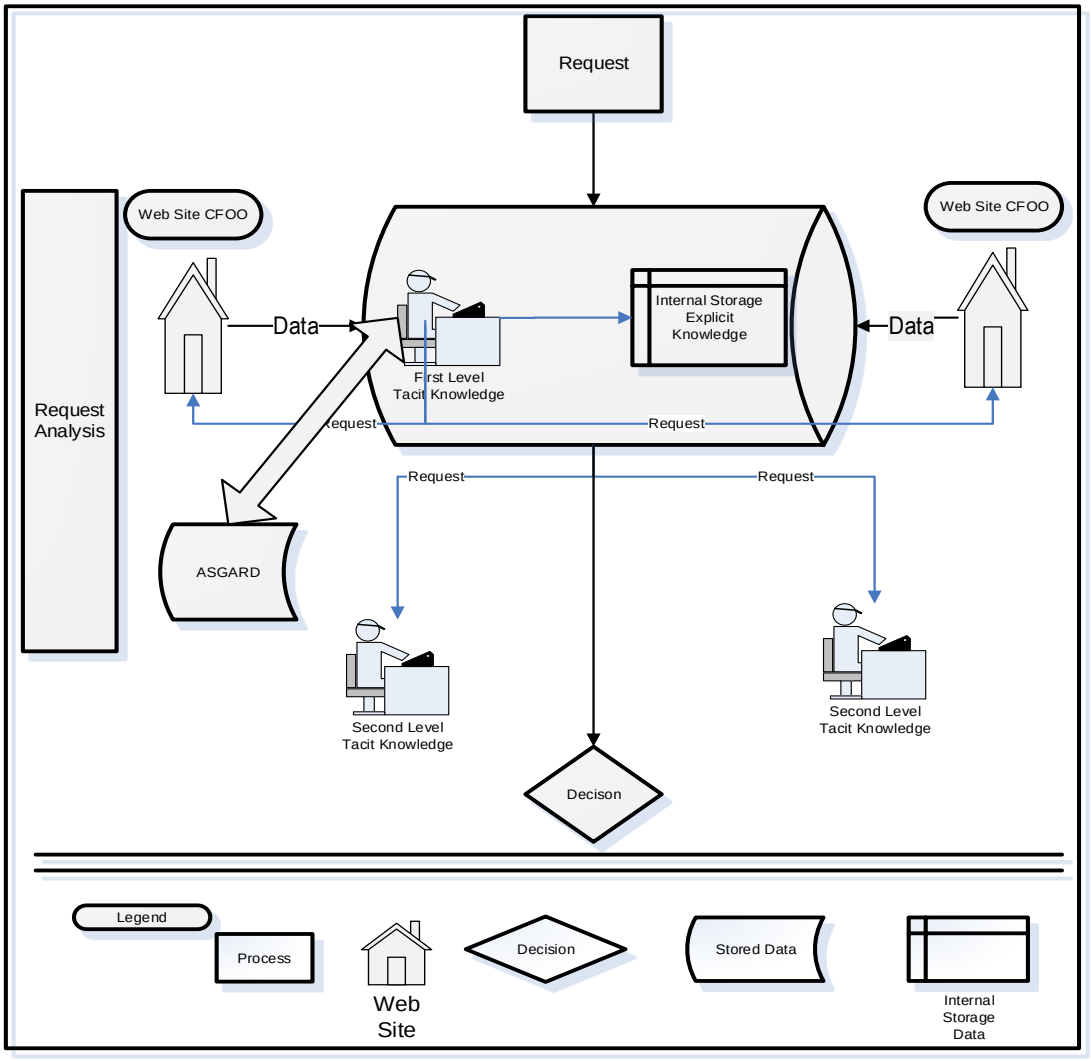


Figure 1: The first-level process—admission application process preliminary analysis

The application analysis process steps are as follows: receiving applications/requests by phone, e-mail, or in person and requesting preliminary analysis based on a telephone interview with the applicant to understand the client's needs. The preliminary process analysis diagram is

based on answers to the qualitative questionnaire presented in Annex 1. In the first-level analysis, knowledge management players ensure necessary data/information systematically, such as the kinds of courses/training requested, timing, and whether the training is for individuals or groups. Following the preliminary analysis of the applicant's needs, the client is directed to the second-level analysis and, after that, to the CFOO faculties for training courses, credited with specific units of credit. The second-level process is depicted in Figure 2.

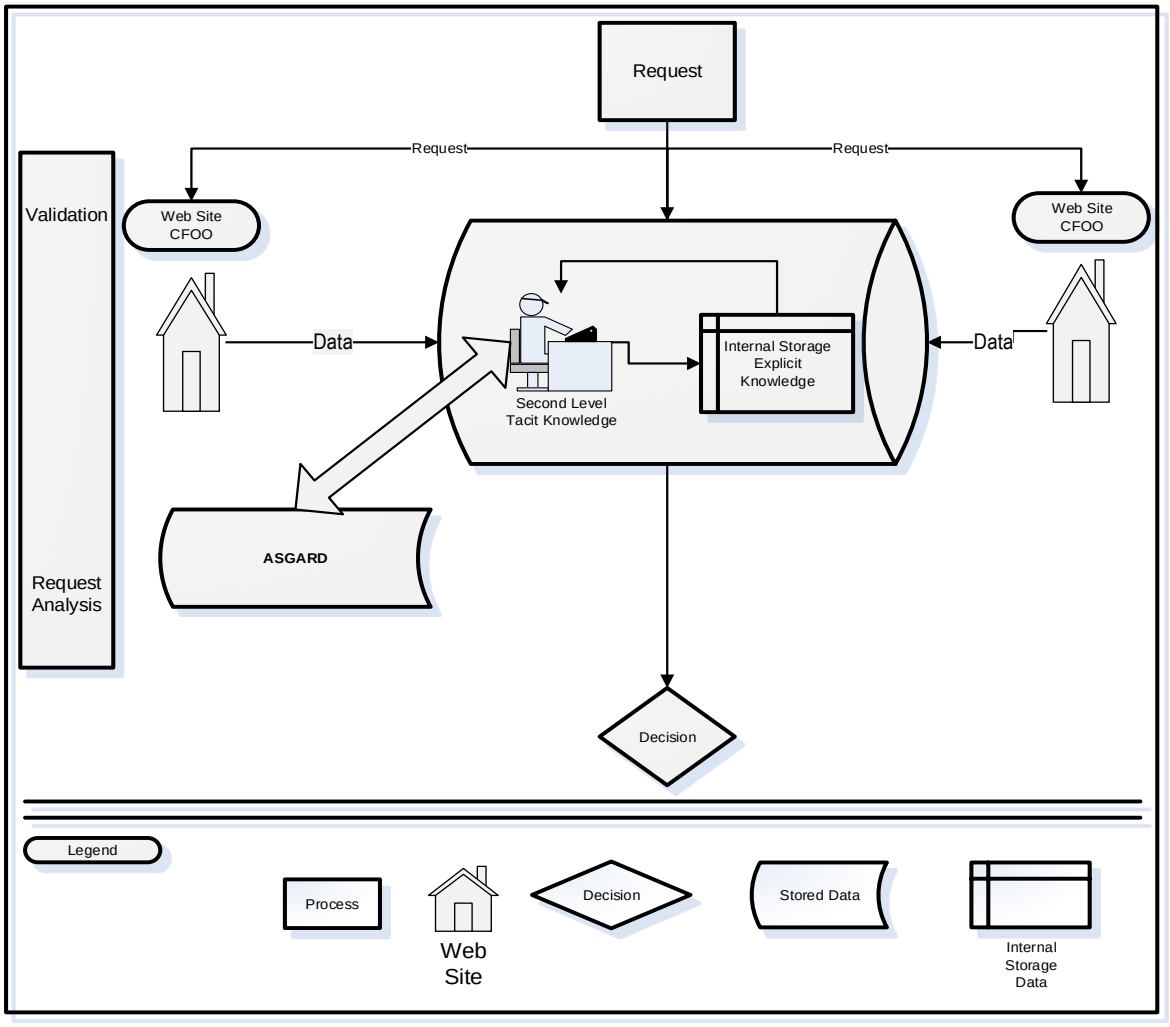


Figure 2: The second-level process—analysis of the process: current situation

The process associated with the second level roughly follows the same steps as the first level with two differences: first, the receipt of applications is identified as a step belonging to the first-level preliminary analysis and is replaced by a validation action in the second-level analysis, and second, the admission application analysis is a more complicated process. In this level, knowledge management actors verify the availability of expertise required to reply to the client's request, consider the possibility of integrating the request for courses/training within existing programs or evaluate to introducing new programs, undertake cost–benefit analysis,

forecast future demand of services if it is a new course or training program that needs to be developed, and analyze competitors' offerings.

Empowering the first level analysts through knowledge sharing and creating a conductive organizational atmosphere where both first-level analysts and second level analysts can share their knowledge and understanding with the use of ICTs and information systems can accelerate and streamline the evaluation process.

Business intelligence and market monitoring allow continuous innovation and management, which improve the organization's ability to anticipate the future and identify new business opportunities. An organization must invest in observation, collection, analysis, and synthesis of information from internal and external networks and focus on disseminating findings from processed data that is considered useful for the organization. Business intelligence and market monitoring should lead to actionable knowledge. An information overload phenomenon is present in the organization and, subsequently, its managers deem it necessary to move to systematic monitoring. In fact, the current CFOO situation is characterized by information overload and partial obsoleteness without being filtered by a continuous information updating process and the organization's external network.

Like the business intelligence process, the knowledge management process can be divided into sub-steps or sub-processes. Before the start of our research, there was no organized knowledge management process for organizations. We had to decode the organizational process by analyzing the knowledge and understanding of the organization held by the individuals who participated in our interviews.

4. FINDINGS

The market for specialized short-term courses, programs, and training is in high demand as the businesses are going through accelerated transformations due to heightened technological advancement, digitalization, and globalization. The centers for continuing education or similar Knowledge-intensive business service (KIBS) organizations need to keep an eye on dynamic market trends continuously.

Technological infrastructure is one of the elements that usually support the sharing of knowledge. It seems extremely important to consider technology as a support element in knowledge sharing, and the CFOO is lacking in effectively using ICT technologies. Through interviews with employees of the first and second levels, it was observed that there is little exchange of information and sharing between these two levels of employees who deal with applications or requests for particular courses or training. Furthermore, first-level employees had no access to information on the available expertise that the CFOO can offer internally or in collaboration with other faculties, institutes, or external partners. First-level knowledge

management players lack empowerment, although they are more likely to share their knowledge with the second-level knowledge management players or management. Second-level knowledge management players are less inclined to share their knowledge with the first-level knowledge management players but they share more with their peers and higher management.

The CFOO lacks a systematic knowledge management strategy to capture, share, and integrate knowledge within their environments and organizational culture to foster interaction among employees of different levels and departments. Both formal and informal connections among individual employees and knowledge-sharing activities depend on the type of knowledge, namely, implicit, explicit, and personal knowledge, necessary to implement in the organization. Thematic coding of content analysis of interview transcriptions, internal documents, including annual reports, strategic plans, and external publications, suggests that Knowledge sharing in this large organization depends on perception, the reward system, trust communication, collaboration, and technology infrastructure. Human factors are much more important than technology and infrastructure, although those are essential as well. The success of knowledge-sharing implementation is highly influenced by organizational culture, knowledge-sharing process, and organization.

Furthermore, this strategy is most often started by significant organizational culture changes from its formalization to include elements that ensure it can promote knowledge sharing and trust between members of the organization. Perception and reward systems seem to be the most decisive in positively influencing knowledge-sharing factors. Other factors, such as trust, openness to communication, and collaboration with the efficient use of ICT infrastructure, were considered important to the success of knowledge sharing.

Based on our study, we can develop the following three propositions:

Proposition 1: Knowledge-intensive business service (KIBS) or Center for continuous education organizations must continuously scan their market trends to keep updated the evolving market demands and prospects. Being updated on the market needs and developing strategies accordingly lead to higher performance of these organizations.

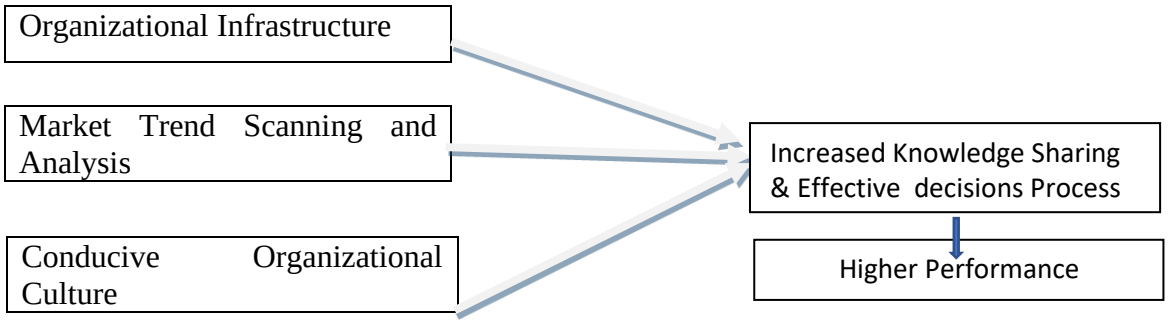
Proposition 2: Knowledge-intensive business service (KIBS) or Center for continuous education organizations need adequate organizational infrastructure, including ICTs and Information Systems (IS), to collaborate, share, and determine organizational and market information in real time, accelerating their organizational process and improve their performance.

Proposition 3: On top of the ICT and IS infrastructure of the KIBS or Center for continuous education, these organizations need to create a conducive organizational culture of trust and

collegiality to share and collaborate among the stakeholders to offer better and unique services for higher performance.

Our propositions lead us to propose the following framework for higher performance of Center for continuous education service providers:

Figure 3: Organizational context, Knowledge Sharing and Higher Performance



5. DISCUSSION

Based on the organization's findings and analysis, we propose some solutions for the CFOO to take advantage of existing knowledge (knowledge identification) and preservation and create new knowledge. This will eventually reduce the time for decision-making processes and lead to improved productivity and collaboration. Besides, good knowledge management offers the possibility of being more flexible, as the organization needs to reply as quickly as possible to the admission applications and market condition changes. Our analysis and recommendations have been presented from four perspectives: organizational culture, organizational change, technology, and human resource (HR) strategy. These solutions are mentioned in order of importance for implementation in the CFOO to improve its competitiveness in a market, such as offering adult education services.

The CFOO needs to work on its *organizational culture*, which fosters collaboration. More precisely, the CFOO should a) develop a mission with the participation of staff and unify the efforts of all the employees to make the CFOO receptive to everyone's ideas; b) establish a high level of trust among members of the organization and identify key people who have essential knowledge within the company; c) allocate time to knowledge management, establish the recognition of knowledge sharing, and implement a standard system of rewards; and d) develop socialization (*tacit to tacit*) using exchange that must be performed verbally during meetings and using observation, appropriate technology to facilitate and enhance knowledge management use groupware (collaborative work), and forums, thereby developing an intranet and systematic business intelligence that facilitate creation and sharing of explicit knowledge.

The CFOO should work on *organizational change*, thereby focusing on a) a change implementation plan to facilitate access and dissemination of knowledge in order to innovate and perform; and b) communication plan implementation in order to explain to employees the knowledge management objectives and its benefits.

In addition, the CFOO needs to focus on *technology* infrastructure, as follows: *a)* intranet use to facilitate communication, exchange, and sharing of information within the organization, b) use of a system of customer relationship management that can meet customers' expectations by offering customized packages that best suits their needs; c) use of an electronic document management system, which provides the ability to save, identify, and track document movements; and d) use of an intelligence decision support system (SAS) that allows data integration, business analytics, and intelligence storage.

The CFOO must focus on HR strategy and implement through the following actions: a) establishing a replacement and retention strategy; and b) benchmarking to compare the CFOO's working methods with their competitors. A business intelligence system could develop resource skills in this area by creating new networks and knowledge.

We propose a knowledge management process in the organization. The future situation radically changes the picture of knowledge at the first and second levels of analysis. The content analysis clearly shows the need for technology infrastructure (in fact, an integrated platform) with a common knowledge base, collaborative platforms between the first- and second-level employees, and real-time access to databases and updates through an electronic document management system and electronic directories for clients, partners, and competitors. An intranet that joins all these components in an integrated platform accompanied by collaboration tools is necessary to facilitate knowledge management sharing (Balmisse, 2005).

Our analysis leads us to recommend the CFOO to radically change the mapping of knowledge associated at the first and second levels processes of organization. The content analysis shows a need to share knowledge through a common base of knowledge and collaborative platforms. In addition, an electronic document management system with electronic directory categories (clients, partners, competitors, etc.) adds value to knowledge management in the organization. In addition to organizational culture and organizational change, Figure 3 shows how the CFOO needs to prepare an integrated system in which first-level knowledge management players can have access to information and database of the organization through the utilization ICTs and other information systems.

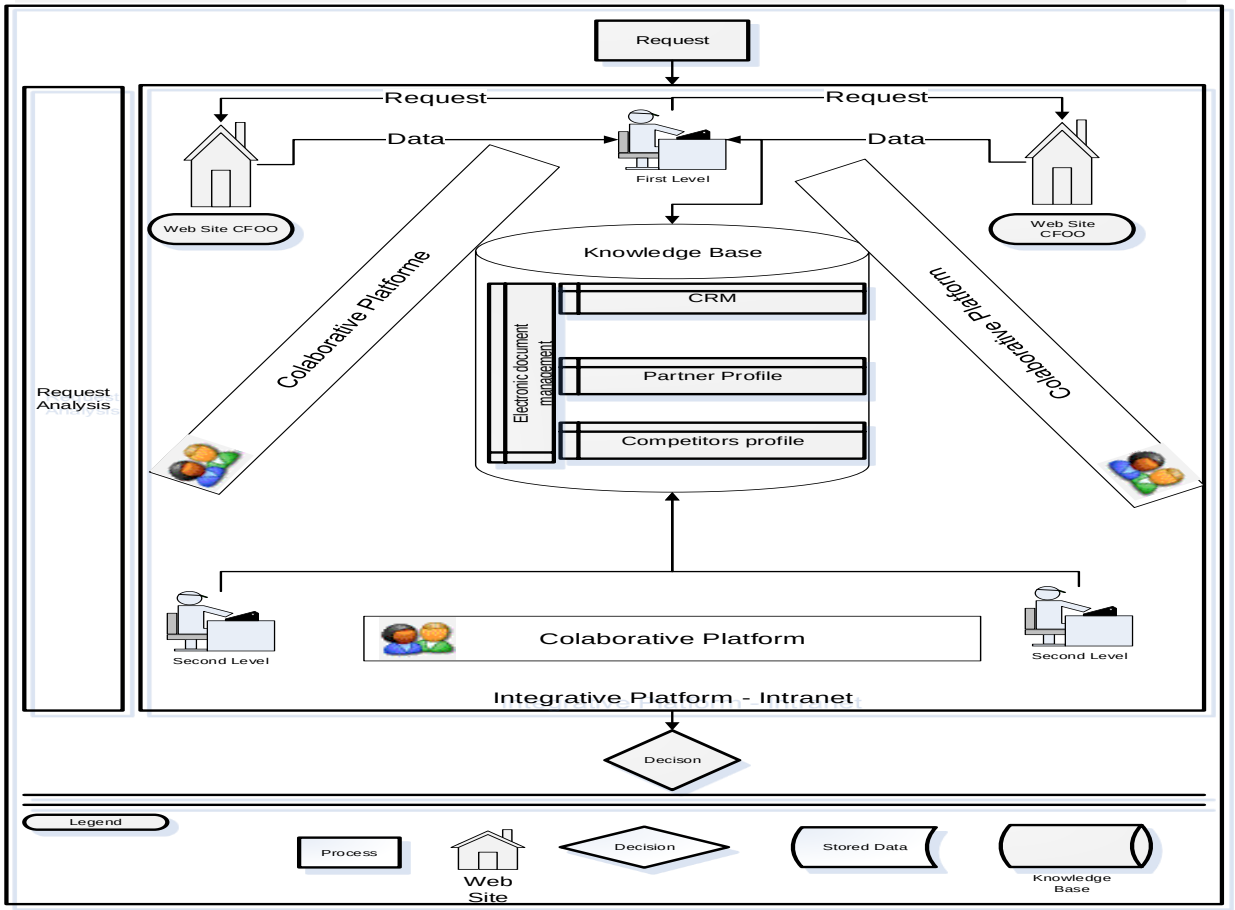


Figure 4: Proposed process: integrated admission applications and analysis process

It is also clear that the business intelligence process and business monitoring are a strong aspect of knowledge management that the company must implement in the short run. The customer is at the Center of organizational strategy and the organization must implement specific activities of strategic intelligence and business monitoring to retain customers. The organization must produce an inventory of competitors, trainers, clients, and partner profiles to refine relationships with customers and reduce decision time. Then, the organization has to set up a monitoring newswire to identify the most effective technologies in training and development in the education market. Finally, the organization must be guided in ways to use relevant and necessary information for strategic decision-making. Figure 4 presents our recommended structure for the future of the business monitoring process of the CFOO.

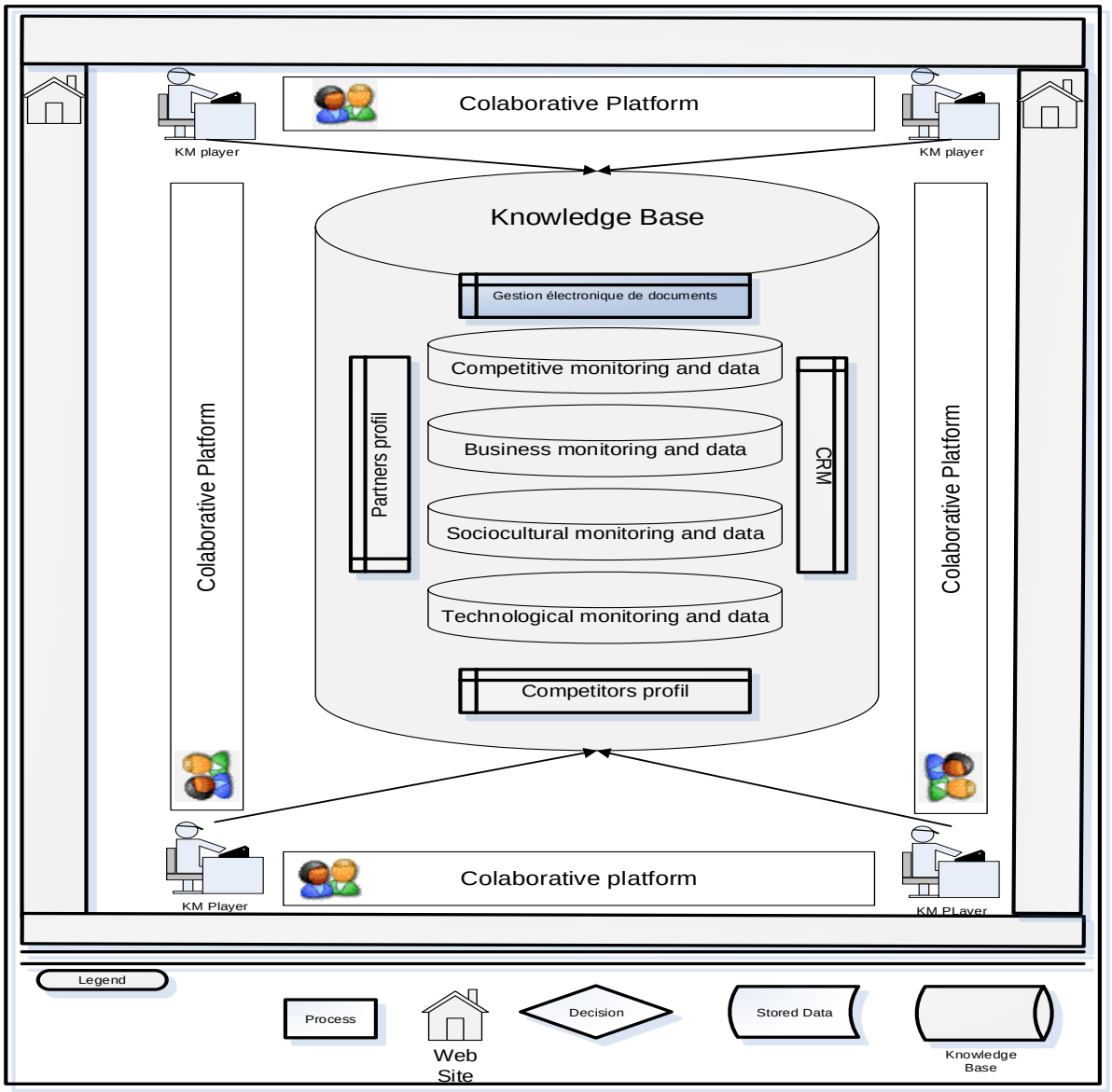


Figure 5: Proposed integarted process: business monitoring process

6. VALIDITY AND RELIABILITY OF THE STUDY

In conducting a qualitative study, meeting the reliability requirement can be challenging because interview respondents could change their views over time. Therefore, it is quite an inherent challenge to find the same results in similar research on different periods of time in different organizations in terms of different contexts, objectives, and processes. An interview guide was used for a semi-structured interview with the employees of the CFOO, and interviews were recorded and transcribed into verbatim with utmost care. To ensure this research's validity and reliability, we used multiple sources of data (verbatims and documents from publicly available sources) (Patton, 1990, pp .464). We have three trained coders who coded verbatims prepared from collected data from several sources. We have then compared

the two coder's coding by an author of this study. The process shows that in more than 84.5% of cases, there were similarities of codes developed by the two coders. They were provided adequate training on coding and research topics, which facilitated a better understanding of the coding process reflected by approximately 85% similar coding. We have also given instructions to coders to keep aside the text where they have doubt or find it difficult to code during the first round of coding and go back to coding those parts once completed the first round of coding. This process has contributed to improving the validity of the coding process. We have assessed reliability informally during the coder training and kept assessing during the actual coding. We then cross-checked the results, and lastly, we compared them to existing literature. The respondents were offered copies of the results to thank them for their participation. Moreover, we generated and saved a database of the data collected and its findings (Protocol description, questionnaire, verbatim, online documents).

Yin (2013) stated that reliability is used to minimize errors and bias in a study. It is impossible to achieve internal validity without reliability. Stronger internal validity increases reliability, making it essential to focus on this type of validity. However, according to Merriam (1998), some factors can ensure the results are reliable. One is triangulation. Our approach is based on multiple methods (focus groups, interviews, and content analysis) and publicly available documents. Our methods of data collection and analysis increase reliability and internal validity. Another strategy mentioned by Merriam (1998) is the interviewer's position, by which the researcher should provide a clear explanation of the theory and assumptions behind the case study, the researcher's position to the study group, and the social environment in which the data were collected. All these issues were carefully respected. Finally, the process of verification has been undertaken; that is, the researcher explains how the data were collected. In general, the reliability target is to reduce the risk of errors in the proposed research project. These criteria have been met throughout this research project.

7. MANAGERIAL IMPLICATIONS

The study contributes to theoretical development by demonstrating that knowledge sharing requires both an integrated technological platform and conducive organizational culture for human interactions. This study's findings will enable senior managers to be aware of the importance of knowledge sharing in the organization and how they can create both technological infrastructure and social dynamics to foster knowledge sharing among the employees and managers. This process will lead to efficiency, productivity, innovation, and creativity. The proposed model will enable managers of knowledge-intensive firms to effectively capture, share, and re-use organizational knowledge and expertise. It will also help leverage staff expertise, create and share knowledge. Web-based system will facilitate tracking requests from clients, conduct data mining, and retrieve information available in the organizational system to reply to clients' requests speedily. It is critical to have an open and collegial culture where knowledge sharing, dialogue among the employees, and innovation are promoted. To that end, the top managers need to effectively ensure alignment among the

people, processes, and technologies to effectively support organizational knowledge management.

8. CONCLUSION AND FUTURE RESEARCH

The case analysis led us to conclude that the CFOO needs to implement a systematic knowledge management strategy for knowledge mapping, knowledge gaps, and knowledge needs. This process could facilitate the development of a knowledge-sharing strategy for innovation and productivity. We observed the willingness for knowledge sharing among the employees during their interviews and their expectations about the state of the knowledge management environment in the organization. Based on the current situation and future expectations, we proposed implementing IT infrastructure (Figures 3 and 4) and a particular organizational culture to create a conducive environment for knowledge sharing. IT infrastructure can facilitate real-time knowledge sharing and enhance the productivity of both the individual who shares his or her knowledge and the receiver of the knowledge, the former by personal enjoyment, feelings of contribution to the organization, and recognition of his/her expertise for the organization and the latter by enhancing his/her capabilities.

We revealed that it is necessary to consider organizational culture, technology, processes, and organizational change when implementing knowledge management systems. It is most important to integrate the HR of all levels—from top management to first- and second-level knowledge players—into the knowledge management strategy. Our findings are based on the fact that knowledge management within the CFOO must start with significant organizational culture changes. In the organizational process, it is necessary to include elements that ensure and promote knowledge sharing and trust between the organization members. Among these factors, the company should establish recognition for knowledge sharing, support the knowledge management infrastructure with appropriate technology, and implement an organization-wide communication plan regarding knowledge management objectives and its specific results. In addition, the knowledge management policy needs to promote learning within the organization. The CFOO needs to be aware that there are several barriers to knowledge sharing, such as fear of losing power, lack of confidence, and lack of time, which must be overcome by organizational reform and introducing a trust-based management culture. The benefits for the organization are visible in the medium and long term. A conducive work environment and changes oriented to knowledge management in organizational culture can provide long-term results. Appropriate measurement of the knowledge management system can ensure that productivity increases. The organization is on a solid foundation for innovation and new knowledge in offering training and short-course services to adults. At the same time, the decision-making process and quality management can be improved radically. The company maintains its assets by establishing procedures for transforming tacit knowledge into explicit knowledge that is easily transferable and will grow through new knowledge.

Beyond the application to the academic organization, this study has a few limitations. First, this research's findings must be interpreted with distinct parameters and cautions, as the sample adopted in this research is based on the context of the CFOO used in this case study. Consequently, the results are specific to the academic organization and knowledge-intensive organizations and are not readily applicable to many other types of organizations in another environment. Second, this research is a cross-sectional study rather than a longitudinal study. Thus, it might not be able to capture the perceptions of the knowledge-sharing behavior of trainees across time. Third, a major limitation of this study is that it is future-oriented and needs to evaluate the organization's knowledge management systems and process of the organization following the adoption of knowledge management policies.

The qualitative research ultimately is both a process and a product in which the researcher is profoundly and unavoidably implicated (sandelowski & Barrosso, 2002). Therefore, a qualitative study's findings are a subjective construction in which the researcher's knowledge, beliefs, and activities play a significant role, and findings are "unique social interactions." For this reason, qualitative research is not statistically but theoretically 'generalizable.' To increase the generalizability of the findings, future research could record and compare the experiences and cases of different academics. To improve the intercoder reliability (ICR), one or more tests among the Scott's (p), Cohen's kappa (k) and Krippendorff's alpha (a) can be used in the future. The human factor is found to be important, which emphasizes the need for knowledge sharing in academia. We strongly hope our study is interpreted as a call for future empirical research on knowledge sharing. The current evidence on the role of HR is mainly anecdotal and empirical results would substantially enrich knowledge in this field. Furthermore, future studies are needed to examine how personal and demographic factors, such as gender, size, country of origin, job position, and field of study, can affect the commitment to Knowledge sharing in the academic environment.

Declarations

- Availability of data and material: This is a case study and have case study related materials.
- Funding: No Funding.

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Annex 1 - Qualitative Questionnaire - Management Level

1. What is the mission of the organization and what is its structure? (Including the status, its offices, programs, departments, structure, etc.);
2. How do you describe the external environment (the business environment) of the organization? (Academia, competition, etc.);
3. What is the number of employees and their functions?
4. How departments or strategic directions of the organization work?
5. What happens in a training program?
6. What is the technological environment (intranet, website, collaboration tools, database servers, video conferencing platforms etc.) ? Is it independent or outsourced)? What is its role in the knowledge management strategy of the organization?
7. What are the elements of organizational culture and how values are conveyed inside and outside?
8. What are the sources of knowledge? How is it shared, created and explained?
9. What are the strategic directions of the organization (business strategy)? Are they independent or linked to other strategies)?
10. What are the skills to develop, according to strategic directions of the organization and which strategies could facilitate the development of targeted strategic skills?
11. What is the context or the current strategy of knowledge management in the organization? Are there already strategic practice communities, e-learning system, virtual teams, mentoring or coaching system, video conferencing, discussion forums, etc.?
12. What is its weight (knowledge management) in the strategy of the organization? Is there a system of classification of knowledge (knowledge map)? What type of Knowledge Management? (tacit or explicit)
13. Is organization focused on a special business process (eg: a training program) for which knowledge management is critical?

14. What percentage of the budget is allocated to the management of knowledge or training? Are these training activities (eg: for beginners, mentoring, coaching)? How are they managed?
15. Who are the key people who have the skills and critical knowledge of the organization?
16. How tacit knowledge is created within the organization?
17. Is there a HR strategy for the organization? What are the main directions of the retention policy (short-term) and staff retention (long-term)?

Annex 2 - Qualitative Questionnaire - Management and Operational Level

1. What are the stages of the process if the process is decomposed?
2. What is the information in each step of the process flow? What is knowledge do we need?
3. Tacit or explicit? Routine or non-routine (specific items)? Where is this information? Which are the key elements of decision?
4. What is the unique expertise that you consider to hold for this service? This unique expertise could be explained and how?
5. Can you mention the difficulties that you met during your career that is common in this stage of problem?
6. What solutions have you found to solve this problem?
7. What are the strengths of your service? How can we measure the success of your service?
8. What are the weaknesses of your service? How could size a failure in the service?
9. What you link the successes and failures of this process step?
10. What recommendation would you make to improve your successor in process?
11. What are the most difficult skills to develop in this stage?
12. What are the strategies to promote the development of these skills?
13. What is your future vision for this service?