Knowledge Management in Projects

Leandro Pereira, ISCTE, Instituto Universitário de Lisboa, Portugal

https://orcid.org/0000-0002-4920-0498

José Santos, Winning Scientific Management, Portugal

https://orcid.org/0000-0003-3543-3570

Álvaro Dias, Universidade Lusófona de Humanidades e Tecnologias, Portugal & ISCTE, Instituto Universitário de Lisboa, Portugal

Renato Costa, ISCTE, Instituto Universitário de Lisboa, Portugal

ABSTRACT

Knowledge transfer in project-based organizations has been recognized as a productivity and economic growth promoter that is currently not properly managed. Therefore, it is critical to investigate the importance of knowledge regarding its acquisition, use, and transfer across all departments of an organization. The main objective of this work was to evaluate how modern organizations from different business sectors manage and share their knowledge by following the knowledge management and transfer life cycles when developing their projects. Organizational surveys were performed to project managers working in project management within in multiple Portuguese industries (or with representation in Portugal) from multiple business sectors and holding different hierarchical positions. The present study revealed that most companies can identify, capture, and retain the relevant knowledge, and apply it to the development of other projects. Thus, the importance of implementing the knowledge management transfer to other projects is crucial for successful project implementation and management.

KEYWORDS

Knowledge, Knowledge Management, Knowledge Shared, Knowledge Stored, Knowledge Transfer, Project Management, Projects, Transfer

1. INTRODUCTION

Globalization and market competitiveness create the need, in modern organizations, to adapt their internal policies and procedures, to this, new Era called Knowledge Economy. Therefore, organizations are now focused on understanding and managing the knowledge of people so they can increase their competitiveness in the markets. Today, organizations face an overflow of information that, in most cases, they don't know how to integrate or even understand the importance of these knowledge. The concept of knowledge management and knowledge transfer aim to provide a different overview of

such problem. Knowledge management is a concept, which is fundamental to increase the efficiency of an organization decision making ability and is increasingly recognized as a promoter of economic growth and productivity but at present is managed inefficiently (Handzi et al., 2015; PMI, 2015).

Knowledge management can be defined by the process through which organizations generate value from their intellectual and knowledge-based assets (Bhattacharya et al., 2004) and consists of both as a set of practices on different research fields (Bootz et al., 2019). Even though knowledge management is available from outside or internal sources, it generally originates within individuals, teams, or organization processes (Anand et al., 2011).

Knowledge management has been recognized by many authors as a lever for growth and development of organizations, nothing is more competitive than its ability to produce innovation and this innovation component will always relate to the management of intellectual capital (Terzieva, 2014). In this way, knowledge management arises to manage this intellectual capital, which allows creating an organization of people's ideas, transforming tacit knowledge into a tangible asset for the organization. This tacit knowledge is powered by the experience acquired over time that allows an individual to confront new challenges and create several solutions. Fialho et al., (2006) argues that the main purpose of knowledge management is to boost and evaluate the ability of an organization in dealing with the abundant flow of information and the ability to adapt to changes. The main purpose to share the knowledge is to make the knowledge visible and to show the role of the impact of knowledge in organizations and encourage employees to foster behaviors such as knowledge sharing and build the knowledge infrastructure (Merlo, 2016).

Knowledge management strategy is also defined by its life cycle, in the existence of several processes that are assumed, to have a role in organizations. It also can trigger open innovation (Lopes et al., 2017). Different models have been introduced by several authors and have been reviewed (Shongwe, 2016).

Due to the diversity of models created, the latest and referred to as an advanced life cycle model of knowledge management was taken into consideration in the present work. This model reflects an evolution over time presented by the authors Evans, and Dalkir Bidian (2014), involving seven stages: identify, create, store, share, use, learn and improve. Although there are 7 stage mentioned, the author Iskandar et al (2017) mention that, the renowned model of four modes of knowledge creation consisted of socialization, externalization, internalization, and combination. Knowledge management process in its implementation is supported by the pillars of information technology in various ways in different companies.

A fundamental concept in Knowledge Management is the knowledge transfer since is one of the elements of the knowledge management process. Argote and Ingram (2000) have defined knowledge transfer as the process through which a group, department or division is affected by the experience of others. organizational knowledge transfer can be observed through changes in knowledge or in the performance of the receiver. Knowledge occurs at various levels, including between individuals, from individuals to the explicit sources, from individuals to groups, between groups, across groups, and from group to the Organization (Argot, 2000). The adequate protection of company´s own knowledge is crucial for companies although the opening handling of knowledge is required in the internal process (Friedrich et al., 2019).

According to the report of PMI-Pulse of the profession, successful organizations are distinguished by the ability to turn ideas into actions providing the competitive advantage they need, recognizing as main formula and effective knowledge transfer (PMI, 2015). With the experience gained over the years, the most effective organizations in knowledge transfer tended to improve the project results. Organizations wishing to acquire skills and capabilities to create a good knowledge transfer must comply with the following steps of the life cycle of knowledge transfer:

1. **Identifying:** Determine what knowledge needs to be transferred
2. **Capturing:** Accumulate the essential knowledge that needs to be transferred

3. **Sharing:** Establish methods for transferring the knowledge
4. **Applying:** Use the knowledge that is transferred
5. **Assessing:** Evaluate the benefits of the knowledge that is transferred

This work aimed to investigate the level of maturity and how modern Portuguese organizations, from different business sectors and size, share knowledge management and transfer life cycle phases, for the development of projects in order to have a better project management performance and efficiency, thus to measure the level of knowledge implementation in their companies and if effectively it increases or not the productivity. This paper also highlights the importance of knowledge applied to project management, namely how it is acquired, used and shared across all departments of a modern organization.

2. LITERATURE REVIEW

The concept of Knowledge is being used in several domains and added to different concepts, such as Management, tacit or explicit within organizations (Hooff & Hendrix, 2004). These concepts of tacit or explicit led to the concept of Knowledge Sharing (Xue, 2017) which can be defined as the organization's performance despite that the effectiveness of sharing activities is difficult to measure (Eze et al., 2013). Other topics related with Knowledge management have been mentioned in the literature by several authors (Xue, 2017 and Turner et al., 2012) such as Creation or Knowledge Acquisition, knowledge storage, Knowledge Dissemination or Knowledge Transfer, Knowledge Application. One of the most relevant topics is the Knowledge transfer related with knowledge management. According to several authors, despite extensive literature on knowledge transfer, little is known about how individuals share knowledge within the framework of project management (Ismail et al., 2009; Todorovic et al., 2015; Serrat, 2017). There are some studies that relate to the influence of knowledge management on project performance (Ismail et al., 2009; Todorovic et al., 2015; Serrat, 2017).

The positive influence of knowledge management on the performance of projects was evidenced in studies conducted and published (Ismail et al., 2009; Todorovic et al., 2015; Serrat, 2017). The influence of learning on the performance of the projects was also presented in studies of quality management and operational management, based on tools like Six Sigma (Arumugam et al., 2013). A study highlights the importance of knowledge management from projects to create added value for customers (Reich et al., 2012) and to create an association between managing and sharing knowledge (Deepak et al., 2019). Besides the positive influence of knowledge management in the performance of projects, the success of it is dependent of several factors, for instance, the author Jennex et al., 2012 affirms that KM success is therefore seen as a measure of the various outcomes of knowledge process capabilities existing within an organization as a result of undertaken KM initiatives. This success is not easy to be measured but it´s important, in order to provide a basis for company valuation, to stimulate management to focus on what is important and to justify investments in KM activities (Jennex et al., 2012). It´s also important, to mention that, the success of knowledge management implementation is determined by identifying influencing elements and understanding their nature (Deepak et al., 2019). In fact, the KM transfer cycle is a good measure to validate if an organization is adopting a strategy to implement a KM initiative, which will be led to a successful KM implementation.

Effective knowledge management in organizations is an increasingly essential tool to achieve success and productive. Following this concept is essential to develop and apply efficient and effective methodologies to enhance the success of projects, enabling the development of a strategy to meet the client's needs and to reduce the risk of project failure. For instance, the risk can be mitigated in cases where an organization or individual do not possess knowledge of a domain area that is needed and the flow of information makes it difficult to understand what is important (Jennex, 2015).

According to a study conducted and reported recently by the Project Management Institute (2015), about project management performed through knowledge transfer, there are few companies

that manage and implement the last two phases of the Knowledge Transfer life cycle. This study presented at the PMI report focused on regions of North America, EMEA (Europe, Middle East, and Africa), Asia and the Pacific Islands, Latin America and the Caribbean).

3. RESEARCH OBJECTIVES

3.1. Method

3.1.1. Sample and Context of Data Collection

Organizational environment surveys targeting business sectors and resources with diversified hierarchical positioning were carried out to obtain a collection of real and accurate information that could assist in understanding how organizations currently look at knowledge management and knowledge transfer potentiality and whether they intend to initiate it in the future. The unit of analysis in this study was project managers working within organizations that manage projects from different frames or areas, such as innovation and strategy, in order to understand the level of maturity and knowledge application in projects as an added value framework. The sample selection was performed to control for extraneous factors and increase generalizability (Hair et al., 2007). The industries selected, we´ve included organizations of different sizes in our sample, increased the generalizability of the results and provided a better output.

3.1.2. Measuring Instrument

This study was based on a qualitative strategy using surveys (via website) to obtain a rapid collection of data. The survey was outlined according to the four-point Likert scale, which includes as optional answers: Strongly disagree, partially disagree, Agree, Strongly Agree. The survey was designed in a positive format to ensure a homogeneous interpretation of the text. The survey included 38 statements which were divided into 3 sections.

The first part of the survey identifies the General data regarding the individual and his/her company (company type; name; department; hierarchical positioning; number of years). The second part includes two general questions and the third part provides a query that was outlined according to the phases of the management and knowledge transfer life cycles.

3.1.3. Data Collection Procedure

The data were collected over a period ranging from 01/2019 to 06/2019. Usually the 6 initial months of the year are used to define the initial projects development. We considered this time range to be sufficient for investigating the short-term impact of the knowledge transfer between different projects. We ensured the reliability of our findings by drawing data from the online survey which has been constructed according the following structure: The first part of the survey identifies the General data regarding the individual and his/her company (company type; name; department; hierarchical positioning; number of years). The second part includes two general questions about knowledge Management and the third part provides a query that was outlined according to the phases of the management and knowledge transfer life cycles, which has been sent to several project managers (172 online surveys) from different type of industries, such as telecommunications, banking, insurance and retail. The use of online survey is useful for non-experimental descriptive designs that are valuable to describe as close as possible the reality. After collecting the data, a matrix has been created with both sets of questions and the process of collecting, aggregating, and analyzing the responses from those questions. The total number of surveys sent, as mentioned previously, has been 172 and a total of 51 correct replies have been validated (it has been considered only the surveys where the respondents have replied to all question since not all of them have replied to all question, thus the data analysis will not be compliant with the needs of Knowledge Transfer), project managers which have replied to all questions mentioned in the survey, from the following industries (table 1):

Table 1. Survey replies

Industry	Total Replies	% of Replies
Telecommunications	17	40
Banking	5	12
Insurance	20	47
Retail	9	21

4. RESULTS AND DISCUSSION

This section includes the presentation and discussion of the results collected from the Survey which aimed to investigate how modern Portuguese industries/organizations of various business sectors apply knowledge management as an organizational benefit, which is an essential component of project management, to effectively manage their projects in an effective manner. It will also be measured the five stages of the transfer of knowledge to develop their projects at individual level, project level and organizational level, in search of better performance and efficiency.

From the total 172 surveys sent (43 for each industry), it has been obtained a total of 51 responses, corresponding to a response rate of 30%. As mentioned before, the only considered valid replies were the surveys which all questions have been replied, thus most of the surveys were incomplete and not considered since the question were linked and followed a sequence.

Each individual, was asked to indicate his/her hierarchical position and the number of years of activity in the company by setting the following intervals: less than one year (<1); one to three years (1-3) and more than three years (>3). The results showed that 49% of individuals are middle managers, 35% are technical project managers and only 16% are top managers. It should be noted that the large majority (82%) have worked for the organization for more than three years. From the 51 individuals, 65% work in organizations that have a Department, or a team dedicated to projects.

According to the results of the survey, in the second part, it´s assumed that management and transfer of knowledge in project management is a present/actual theme in most organizations (table 2). On the other hand, it is essential to highlight that the unanimity of respondents recognizes Knowledge as a valuable asset for the development of projects in their organization. The survey has been based in the replies from different industries with compliance replies and assumptions of the valuable approach in KM. Although this understanding, most of the times, it´s not well tapped by companies and stakeholders as an added value perspective.

In phase 1 of knowledge management life cycle (Identify and/or Create) in table 3, one can see that the majority of respondents agree that the identification and creation of knowledge are key elements for project development, through teams and project managers. Most of the respondents (87%) are able to identify the knowledge of the project team and direct it to each project type. These answers

Table 2. Survey Second part – General Questions

Phase 1: Identify and/or Create				
Question	Strongly Disagree (%)	Partially Disagree (%)	Agree (%)	Strongly Agree (%)
(1) The subject "Knowledge Management and transfer in Project Management" is a current matter in my organization	10	20	49	22
(2) Knowledge is valuable for the development of projects in my organization	0	0	29	71

Table 3. Survey Third Part. Phase 1 (Identify and/or Create)

Phase 1: Identify and/or Create				
Question	Strongly Disagree (%)	Partially Disagree (%)	Agree (%)	Strongly Agree (%)
(1) I identify the project team´s knowledge and I address it to each type of project	2	12	65	22
(2) I participate in/conduct constant brainstorming and group meetings within each project	2	14	55	29
(3) In my organization project team and managers meetings, enable the creation of new ideas that explored and filtered can help in problem solving of projects	0	4	61	35
(4) I identify the information extracted from knowledge in order to solve problems/decision making that arise in the course of projects	0	2	71	28
(5) In my organization, the quality and relevance of the information extracted from Knowledge contributes to the development of the projects	0	14	53	33

are in line with the literature (Örtenblad, 2017), namely that in the case of Knowledge Management, most works are positive, and Knowledge Management is assumed and described as being able to bring various kind of advantages.

The frequent participation of project teams and managers in group meetings and brainstormings are invaluable for troubleshooting and development of projects, thus, to create more efficiency based in the concept of knowledge. This is reflected by the unanimous opinion of respondents agreeing with these statements since more than 80% of the responses agree with this participation of project teams and managers.

In the 3 question, 50 of the respondents believe that the quality of information extracted from Knowledge contributes to problem-solving and decision-making, as well as, for the development of projects (which can be a competitive advantage. In this question only 1 replied that he partially disagrees with this contribution. In fact, the author Örtenblad (2017) mention that decision-making processes involved need to be supported by appropriate Knowledge Management strategies.

Regarding phase 2 of knowledge management life cycle (Store) in table 4, as expected, the clear majority of respondents (92%) believe that the acquired knowledge is critical to their organization. A small percentage partially disagreed (8%). Analyzing this fraction in more detail, the disagreement is not dependent on the size, type of business and department but rather on the number of activity years in the company. Three out of four respondents who disagreed partially have been employed by their companies for less than for less three years. In addition, two of the four respondents mentioned that the organization where they work does not hold a department or a team dedicated to projects.

A clear majority of respondents (86%) revealed that knowledge is stored on paper and/or digital format. This seems to be related with the absence of a team or department dedicated to projects since five of the six respondents do not store the knowledge, mentioning their absence, regardless of the type and size of company, department, hierarchical position and number of years of activity at the company. It´s assumed that, current companies, will continue to invest in technology in order to respond to enhance the productivity of their resources and to ensure that information is not lost, thus the fact that most of the respondents mentioned they never store the knowledge can change be a negative drive to a successful Knowledge Management System. Although, concerning the knowledge that is stored, for future contribution in projects, only 61% of respondents agreed that this knowledge is used in future projects. Eleven of the twenty respondents who disagreed (39%) have no department

Table 4. Survey Third Part. Phase 2 (Storing)

Phase 2: Storing				
Question	**Strongly Disagree (%)**	**Partially Disagree (%)**	**Agree (%)**	**Strongly Agree (%)**
(1) The storage of the acquired Knowledge is fundamental to my organization	0	8	53	39
(2) In my organization, the storage of Knowledge is done in paper and/or digital format	2	12	53	33
(3) In my organization, Knowledge is well stored, organized, structured, evaluated and filtered allowing information to be used in new projects	8	31	53	8
(4) I record organizational Knowledge as historic/background to be used in future projects	10	24	57	10
(5) I record and store the Knowledge transferred by stakeholders	4	29	53	14
(6) In my organization, there is repository to consult the records of knowledge	12	16	57	16

of projects in their organization. Most respondents (67%) register knowledge in databases for their use in future projects. Ten of seventeen respondents do not have a Department, or a team dedicated to projects in their organization.

This study revealed that 67% of respondents perform the registration and storage of knowledge transferred by stakeholders. Eleven of the 15 respondents who disagreed do not have a department or team dedicated to projects in their organization. It should be noted that 73% of respondents answered that there is a repository for records of knowledge in their organization. Without a reliable system to store existing knowledge and accumulate new knowledge, it would be difficult to react to significant market changes. However, both large and small companies can benefit from Knowledge Management because it treats the knowledge that every individual brings as an asset, so employees feel respected for their skills in the workplace.

The results regarding phase 3 of the knowledge management life cycle (Sharing) can be found in table 5.

In question 1, a total of 55% of the respondents agree or strongly agree and 45% disagree with the statement, of which 37% disagree partially and 8% totally disagree. It is important to highlight that survey replies were provided by technical project managers and intermediate managers, which may indicate that such network sharing can be accomplished mostly by top managers.

Regarding the existence of sharing and transfer of knowledge between managers and the project team, almost all of respondents answered positively.

Although most organizations encourage employees to share and transfer knowledge (79% of respondents answered positively to this statement), there are still 22% who disagreed. It is important to stress that 7 out of the 11 respondents replying negatively to the statement are inserted in organizations that do not have a department or team dedicated to projects (question 3).

In question 4 it is possible to observe that 81% of respondents agree that project managers are open to knowledge transfer from their teams for project's success. Noteworthy, 20% of respondents in disagreement are inserted in organizations that do not have a team dedicated to projects or a Department.

In the Fig. 1 there is the statements classified by the respondents based on the five phases of the knowledge transfer life cycle and that are integrated into the phase Share of knowledge management life cycle. Contrarily to the data presented in the report of the Project Management Institute carried
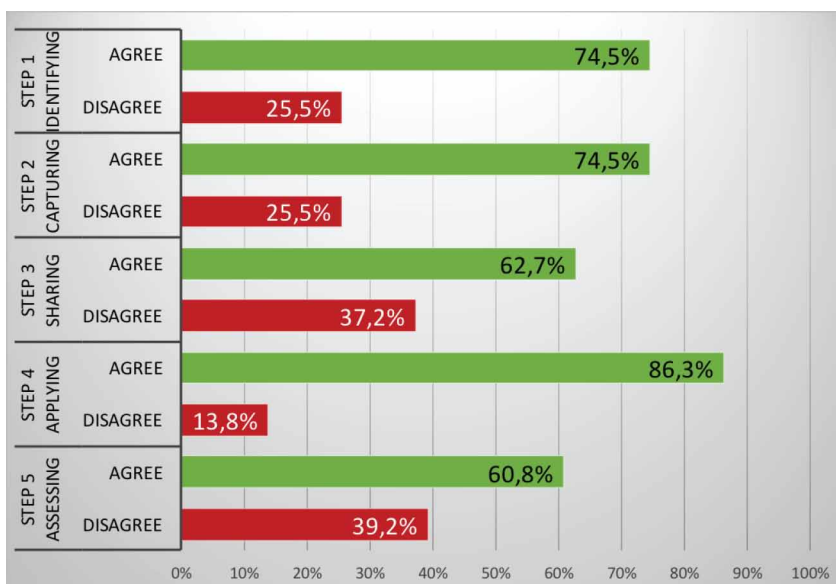
Table 5. Survey Third Part. Phase 3 (Sharing)

Phase 3: Sharing				
Question	Strongly Disagree (%)	Partially Disagree (%)	Agree (%)	Strongly Agree (%)
(1) There is a knowledge-sharing network among different departments of my organization in order to enrich the development of projects	8	37	43	12
(2) I share and transfer the Knowledge between the Manager and the Project Team	2	0	69	29
(3) My organization encourages employees to share and transfer their knowledge	2	20	53	26
(4) In my organization, project managers are receptive to the knowledge transfer of their team for the success of a project	2	18	55	26

out in the regions of North America, EMEA (Europe, Middle East and Africa), Asia and the Pacific Islands, Latin America and the Caribbean (PMI, 2015), this study revealed that the majority of Portuguese companies or with representation in Portugal follow steps 1, 2 and 4 (with 74.5%, 74.5% and 86.3% of positive replies, respectively) of the Knowledge Transfer life cycle, corresponding to the identification of the relevant and valued knowledge, its capture and retention, and finally its application. Steps 3 and 5 corresponding to the transfer of knowledge with others and to the evaluation of the value or benefit of knowledge transfer are lagging behind with percentages of 62.7% and 60.8%, respectively. Further studies will be needed to identify the reason why organizations are not so effective in these two steps.

Regarding phase 4 of the knowledge management life cycle (Use) present in table 6, i.e. the use of knowledge stored and shared, 79% of respondents replied that they use this knowledge in problem-solving and decision-making during the course of a project (question 1). Half of the respondents

Figure 1. Statements that were classified by the respondents based on the five steps of the knowledge transfer life cycle

Table 6. Survey Third Part. Phase 4 (Use)

Phase 4: Use				
Question	Strongly Disagree (%)	Partially Disagree (%)	Agree (%)	Strongly Agree (%)
(1) In my organization, after knowledge is identified, stored and shared, it is used in Problem-Solving and decision making in the course of a project	2	20	67	12
(2) In my organization, the application of Knowledge allows to improve the managers and the project team member skills	2	16	57	26

answering negatively, do not have a Department or project team organization. The majority of respondents (83%) agreed that the application of knowledge allows the improvement of managers and project teams skills (question 2).

With regard to phase 5 of the knowledge management life cycle (Learn) present in table 7, 61% of respondents agree that the knowledge used and shared in previous phases, is subsequently reviewed and improved for the benefit of new projects, which is in line with the results obtained by the author Deepak et al., 2019 when is mentioned that the need to have Knowledge Management process within an organization ensures that Knowledge gained from previous projects is effectively captured and reused.

In these results, it should be highlighted that the high percentage of discordant replies (39%) was given by top managers, middle managers, and technical project managers, most of which belong to multinational organizations (question 2). The vast majority (94%) agree that the learned knowledge contributes positively to the professional maturity of employees.

The majority of respondents (90%) believe that learning improves managers and project teams' knowledge for the benefit of future projects (question 3). Regarding the knowledge learned, 69% agree that it allows employees to strengthen their experience and professional maturity; the 31% disagreeing have been in the Organization for more than 3 years (question 4).

For the las phase, the phase 6, knowledge management life cycle (Improve) is presented in table 8. Results in question 1 show that 61% of respondents consider that their organizations refine and improve their knowledge, registering it for future use in projects. Noteworthy, 39% of respondents do not practice it, the reason being impossible to know from this study. However, the majority of

Table 7. Survey Third Part. Phase 5 (Learn)

Phase 5: Learn				
Question	Strongly Disagree (%)	Partially Disagree (%)	Agree (%)	Strongly Agree (%)
(1) In my organization, the learned Knowledge enable employees to gain more experience and professional maturity	2	4	49	45
(2) In my organization, the Knowledge that was used and shared, is subsequently reviewed and improved for the benefit of new projects	4	35	45	16
(3) In my organization, learning allows to improve the Knowledge of managers and project teams for the benefit of future projects	2	8	49	41
(4) In the field of PM, when Knowledge is inadequate and immature, new identification and capture of Knowledge is conducted in my organization	6	26	53	16

Table 8. Survey Third Part. Phase 6 (Improve)

Phase 6: Improve				
Question	Strongly Disagree (%)	Partially Disagree (%)	Agree (%)	Strongly Agree (%)
(1) In my organization, all the knowledge acquired and refined is improved and recorded for use in future projects	6	33	51	10
(2) The Knowledge improvement in Project Management, as well as, its record is advantageous to my organization	2	4	51	43
(3) In my organization, the lessons learned are recorded to improve the positives aspects and minimize/eliminate the negative aspects	8	29	53	10
(4) In my organization, there are tools for the record of the entire historic of lessons learned while managing a project	20	35	39	6

the replies (94%) consider it relevant to improve the knowledge for the development of projects in their organization.

Almost all of the respondents affirm that knowledge improvement and record are a considerable advantage in companies, thus it should be established and adopted. The replies, presented in question 3, demonstrate that 63% of respondents perform the registration of lessons learned to improve the positive points, of each project registered in the lessons learned, in the phase 6 (improve) and minimize/eliminate the negative ones.

The remaining respondents (37%) do not do it. These negative responses are correlated not with the existence of a Department or team dedicated to projects in the organization, but rather with the lack of tools for recording the lessons learned in the field of project management (55%).

A considerable negative aspect is the fact that 55% of the respondents mention, in question 4, they do not use tools to record the entire historic lessons learned. Which means, they assume it´s important in question 2 but to implement it, it´s a considerable paradox and most of them don't do it for several different reasons.

Based in the overall responses it´s assumed that knowledge management facilitate the way project success is reached, making it efficient and thus boosting customer satisfaction although it´s not being implemented by all companies inquired. Based on these results, it´s important to assume that some key factors of Knowledge Management, which influence on-site execution of works, mentioned by the author Deepak et al., 2019, such as established information technology, teamwork, trust, leadership, incentives for knowledge sharing, individual and group level skills and competencies, are mentioned, as replies, in the survey. Thus, the assumption of the beneficial implementation of a KM strategy is crucial for companies to gain a considerable added value in several areas, that can be from the technological point of view, to personal competences or even to decision making capabilities or critical thinking.

In almost all of the answer, during the survey and every step of the different phases, there is a clear understanding the importance of Knowledge Transfer within an organization, the reason is that a knowledge management is useful not only during a successful transfer of Knowledge between teams in different projects but it can be useful during the next decade, for instance, if a person, inside the organization, is capable of linking the old information to the new, for it is the ability of the person who is the determinant of any successful endeavour in an organization.

This work aimed to investigate the level of maturity and how modern Portuguese organizations, from different business sectors and different size, share knowledge management and transfer life cycle phases, for the development of projects in order to have a better project management performance and efficiency. It´s important to keep in mind that Knowledge Management is often used differently for

small and medium (SME) to large organizations. The sample provided in this paper was a mix of SME and large organizations. Thus, for instance, the small and medium companies from the sample must slice out a competitive market advantage early on, and, therefore, benefit from KM by codifying and storing internal knowledge. For Large companies the use of Knowledge Management to act quickly in the digital age, where business changes constantly and often without warning is almost mandatory in order to keep a competitive advantage.

Although, the benefits of KM can be seen directly or immediately, the primary goal is to increase company efficiency to improve business decision-making. The aim is that building expertise into your organization - and dispersing it amongst employees - empowers you to make more informed, faster, and ultimately more profitable decisions. Most of the responses in the questionnaires mention the valuable capabilities of Knowledge Management as a decision-making concept not all of them implement or even keep the records of past projects in order to contribute to the Knowledge Management Share.

5. CONCLUSION

This study investigated how modern Portuguese organizations from different business sectors, as mentioned before, generate and share the life cycle phases of the management and transfer knowledge in different sectors of the Portuguese business sectors, thus it provides a better overview of the different implementation of Knowledge management processes in different industries proving a global and more comprehensive overview of its implementation and results obtained, thus if their applicability increase the organizations performance. The results generated from the organizational surveys, revealed that most Portuguese companies or with representation in Portugal perform the identification of relevant and valuable knowledge, its capture and retention, as well as, its application in other projects. Although most of them affirm this, they don´t implement it or even use tools to created added value. However, the stages corresponding to i) knowledge transfer among employees within the Organization (Share), and ii) the evaluation of value or benefit of the knowledge transferred (Evaluation), are not being practiced. The lack of a project department or a team dedicated to projects within the organization seems to be limiting the effectiveness of knowledge management and lifecycle transfer between several different projects. In the other hand, organizations that make the greatest use of their knowledge assets understand the competitive advantage they can develop as they manage projects smartly and more efficiently, which become crucial in a digital and competitive world. This added value is in line what is described by the author Jennex et al., 2012, where he affirms that KM success is reusing knowledge to improve organizational effectiveness by providing the appropriate knowledge to those that need it when it is needed.

In order companies adopt or improve their Knowledge Management in projects is important that they learn the ability to create, share and absorb knowledge among dispersed organizational members of varied cultural backgrounds and working together for a limited period of time. This is a very complex task which should be based in the exploitation of their knowledge assets in accordance with a knowledge-based view of the organizations structure. Companies should be aware that most knowledge-management initiatives in project-based firms have failed for a variety of reasons, which could be technological, cultural, knowledge content and project management reasons (Chua et al., 2005). Thus, it´s important that they share consistently the information through a workflow which can assure the Knowledge among dispersed organizational members of varied cultural backgrounds. This organizational culture is crucial for the concepts of learning and sharing Knowledge inside an organization (Jennex et al., 2012) which produce considerable positive results in terms of Knowledge implementation.

In terms of lessons learned, It is important that organizations create conditions that promote the knowledge transfer within employees from different hierarchical positions, department or sections through informal meetings, brainstorming, workshops, team building and allowing them to define suitable strategies for developing future projects successfully based in the knowledge transfer from

different sections and the lessons learned from different projects, which can be a crucial strategic advantage. Knowledge is a strategic valuable resource which allow organizations to gain a considerable sustainable competitive advantage in order to be better positioned in terms of market objectives, thus, it´s applicability should not only be considered by managers but all company employees. It´s important that companies can create and use digital platforms to record and share different projects across the company in order to facilitate the access and the shared knowledge.

Another important lessons, is the implementation of simple and effective tools, internal sharing networks across all departments of the Organization, covering all stakeholders, for registration and management of knowledge and lessons learned.

In short, it can be concluded that Knowledge Management is a framework which contribute significantly to achieve higher business goals based in a smarter and more efficient productive way. It can be used to develop new opportunities, create value, obtain competitive advantages and improve organizations performance.

6. LIMITATION OF THE STUDY

Despite its important theoretical and practical contributions applied to knowledge management, this research suffers from some methodological limitations due to the application of a limited knowledge management principles when it has been mentioned several of them. Thus, further studies will be needed to carry on the application of the different concepts of knowledge management and, for instance, estimate the added value of project based in the assumption of knowledge management and knowledge transfer and another project developed from the scratch without the adaptation of any knowledge management. Other limitation is related with the sample, thus future research might test our methodology on a wider number of organizations in different industries and countries in order to generalizability the results.

7. FUTURE STUDIES

Future studies will be needed to understand the reasons for the inefficiency management of the lack of applicability of knowledge transfer in the different type of industries and how it can be an issue in terms of project implementation and absence of gains and the incapacity of a correct implementation of project incrementation and optimization. It also can be important a study which measure the effectiveness of each type of life cycle of knowledge transfer inside an organization and each one is considered the most relevant.

REFERENCES

Anand, A., & Singh, M. D. (2011). Understanding knowledge management. *International Journal of Engineering Science and Technology*, *3*(2), 926–939.

Argote, L., & Ingram, P. (2000). Knowledge transfer: A basis for competitive advantage in firms. *Organizational Behavior and Human Decision Processes*, *82*(1), 150–169. doi:10.1006/obhd.2000.2893

Arumugam, V., Antony, J., & Kumar, M. (2013). Linking learning and knowledge creation to project success in Six Sigma projects: An empirical investigation. *International Journal of Production Economics*, *141*(1), 388–402. doi:10.1016/j.ijpe.2012.09.003

Bootz, J., Durance, P., & Monti, R. (2019). Foresight and Knowledge management. New developments in theory and practice. *Technological Forecasting and Social Change*, *140*, 80–83. doi:10.1016/j.techfore.2018.12.017

Chaudhury, P. K., & Bhattacharya, P. (2004). *Knowledge management and its utilisation: An overview*. Academic Press.

Chua, A., & Lam, W. (2005). Why KM projects fail: A multi-case analysis. *Journal of Knowledge Management*, *9*(3), 6–17. doi:10.1108/13673270510602737

Deepak, M. D., Mahesh, G., & Medi, N. K. (2019). Knowledge Management Influence on Safety Management Practices: Evidence from Construction Industry. *International Journal of Knowledge Management*, *15*(4), 16–37. doi:10.4018/IJKM.2019100102

Evans, M., Dalkir, K., & Bidian, C. (2014). A holistic view of the knowledge life cycle: The knowledge management cycle (KMC) model. *Electronic Journal of Knowledge Management*, *12*(2), 85–97.

Eze, U. C., Goh, G. G. G., Goh, C. Y., & Tan, T. L. (2013). Perspectives of SMEs on Knowledge Sharing. *The Journal of Information and Knowledge Management Systems*, *43*(2), 210–236.

Fialho, F. A. P., Macedo, M., Santos, N., & Mitidieri, T. D. C. (2006). Gestão do conhecimento e aprendizagem: as estratégias competitivas da sociedade pós-industrial. Florianópolis: Visualbooks.

Friedrich, J., Becker, M., Kramer, F., Wirth, M., & Schneider, M. (2019). Incentive design and gamification for knowledge management. *Journal of Business Research*.

Hair, J. F., Black, W. C., Babin, B. J., Anderson, R. E., & Tatham, R. L. (2007). *Multivariate data analysis*. Prentice Hall.

Handzic, M., & Durmic, N. (2015). Knowledge Management, Intellectual Capital and Project Management: Connecting the Dots. *Electronic Journal of Knowledge Management*, *13*, 51–61.

Hooff, B. V. D., & Ridder, J. A. D. (2004). Knowledge Sharing in Context: The Influence of Organizational Commitment, Communication Climate and CMC Use on Knowledge Sharing. *Journal of Knowledge Management*, *8*(6), 117–130. doi:10.1108/13673270410567675

Iskandar, K., Jambak, M. I., Kosala, R., & Prabowo, H. (2017). Current Issue on Knowledge Management System for future research: A Systematic Literature Review. *Procedia Computer Science*, *116*, 68–80. doi:10.1016/j.procs.2017.10.011

Ismail, W. K. W., Nor, K. M., & Marjani, T. (2009). The role of knowledge sharing practice in enhancing project success. *Institute of Interdisciplinary Business Research*, *1*(7), 34–52.

Jennex, M. E. (2015). Special issue on Knowledge Management and risk. *International Journal of Knowledge Management, 11*(4).

Jennex, M. E., Smolnik, S., & Croasdell, D. (2012). Towards a consensus knowledge management success definition. In Organizational Learning and Knowledge: Concepts, Methodologies, Tools and Applications (pp. 403-415). IGI Global. doi:10.4018/978-1-60960-783-8.ch201

Lopes, C. M., Scavarda, A., Hofmeister, L. F., Thomé, A. M. T., & Vaccaro, G. L. R. (2017). An analysis of the interplay between organizational sustainability, knowledge management, and open innovation. *Journal of Cleaner Production*, *142*, 476–488. doi:10.1016/j.jclepro.2016.10.083

Merlo, T. R. (2016). *Factors Influencing Knowledge Management Use in Technology Enterprises in Southern United States*. Elsevier. doi:10.1016/j.procs.2016.09.098

Ortenblad, A. (2017). Handbook of Research on Knowledge Management Adaptation and Context. *International Journal of Knowledge Management*, *13*(1).

PMI. (2015). *Capturing the Value of Project Management Through Knowledge Transfer*. PMI.

Reich, B. H., Gemino, A., & Sauer, C. (2012). Knowledge management and project-based knowledge in it projects: A model and preliminary empirical results. *International Journal of Project Management*, *30*(6), 663–674. doi:10.1016/j.ijproman.2011.12.003

Serrat, O. (2017). Managing Knowledge in Project Environments. In *Knowledge Solutions*. Springer. doi:10.1007/978-981-10-0983-9_57

Shongwe, M. M. (2016). An analysis of knowledge management lifecycle frameworks: Towards a unified framework. *Electronic Journal of Knowledge Management*, *14*(3), 140.

Terzieva, M. (2014). Project Knowledge Management: How organizations learn from experience. *Procedia Technology*, *16*, 1086–1095. doi:10.1016/j.protcy.2014.10.123

Todorović, M. L., Petrović, D. Č., Mihić, M. M., Obradović, V. L., & Bushuyev, S. D. (2015). Project success analysis framework: A knowledge-based approach in project management. *International Journal of Project Management*, *33*(4), 772–783. doi:10.1016/j.ijproman.2014.10.009

Turner, J. R., Zimmerman, T., & Allen, J. (2012). Teams as a Sub-Process for Knowledge Management. *Journal of Knowledge Management*, *16*(6), 963–977. doi:10.1108/13673271211276227

Xue, C. T. S. (2017). A Literature Review on Knowledge Management in Organizations. *Research in Business and Management*, *4*(1), 30–41. doi:10.5296/rbm.v4i1.10786

Leandro Pereira is an Assistant Professor at ISCTE Business School in Lisbon and Director of Executive Master Programs and Project Management at INDEG-ISCTE. He has a Ph.D. in Management, specialized in Project Management Field. Dr. Pereira is the CEO of WINNING Scientific Management, a consultant company with hundreds of employees that manage more than 50M€ in their portfolio. He received a national distinction of the Best Team Leader in Portugal, an award from Best Team Leaders Association. Dr. Pereira has seven books written about "Value Creation". ISCTE-IUL. Av. das Forças Armadas, Lisbon.

José Pedro Santos is a PhD student and Head of Winning LAB the scientific laboratory of Winning Scientific Management. He has an extensive knowledge in management and already published several scientific papers as well presented several papers in international conferences. José, has more than 10 years of professional experience.

Álvaro Dias is Professor of Strategy at Universidade Lusófona and ISCTE-IUL, both in Lisbon, Portugal. He got his Ph.D. in Management from Universidad de Extremadura, Spain, after an MBA in International Business. Professor Dias has over 24 years of teaching experience. He has had several visiting positions in different countries and institutions including Brazil, Angola, Spain, Poland, and Finland. He regularly teaches in English, Portuguese, and Spanish at undergraduate, master and doctorate levels, as well as in executive programs. Professor Dias has produced extensive research in the field of Tourism and Management, including books, book chapters, papers in scientific journals and conference proceedings, case studies, and working papers.

Renato Lopes da Costa. PhD in General Management, Strategy and Business Development by ISCTE (Portugal) has articles published in several specialized journals in the East, the United States, Canada, Africa, South America and Portugal. He is currently a researcher and member of BRU-UNIDE and a professor at INDEG where he holds the post of director of the MScBA (Master in Business Administration) and guides students in the development of master's and PhD theses. Teaches business strategy modules in executive and post-graduate master's degrees. Since 2013 he has also accumulated teaching duties as an invited professor at the Military Academy where he teaches the Knowledge Management module in the Master's degree in Leadership.