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Increment lessons learned by sharing tacit knowledge in non-profit organizations

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Abstract

Focusing the study's focus on sharing tacit knowledge in non-profit organizations (NPOs), in Portugal and taking as a case study the Portuguese volunteer firefighter (FBs), we listed as objectives, the determination of the prevalence of lessons learned by sharing tacit knowledge and the identification of actions and measures for its promotion. A review of the literature on lessons learned and sharing of tacit knowledge allowed the identification of indicators that allowed the determination of its prevalence in the NPOs. A mixed methodology followed, where data collections were combined via interviews and questionnaires, which analysis of results made it possible to answer the established objectives.

It was possible to perceive the difference of opinions between firefighters and commanders, regarding the prevalence of lessons learned, being necessary to implement actions and measures that allow the construction of a collective vision of these organizations, on the part of all the stakeholders. It was also possible to create a performance matrix, with actions and measures for this purpose, which promotes an increase in the lessons learned by sharing tacit knowledge.

Keywords: Lessons learned, non-profit organizations, sharing tacit knowledge

I. INTRODUCTION

We live days marked by rapid and constant changes in society. The organizations that compose it are increasingly characterized by increasing competitiveness and greater pressure to fulfill their missions, obeying the highest quality standards. The traditional factors of production pointed out by classical literature, such as labor, capital, and land, on which economic activity was based, according to Drucker (2003) [1], are now insufficient in view of the demands imposed by a social environment where uncertainty prevails over the need for flexibility and speed in responses.

It is with the advent of this organizational situation that knowledge emerges as a powerful, valuable, and irreplaceable asset. According to Davenport and Prusak (1998) [2], it is a crucial factor, responsible for the introduction of innovations, an enhancer of wealth creation and improvement of the quality of life of individuals, and a source of sustainable competitive advantage for organizations. Thus, the ability of organizations to carry out their missions effectively depends more and more on their ability to mobilize the knowledge they hold in favor of organizational learning that provides them with a continuous gain of skills.

In this segment, FBs are non-profit organizations with unique characteristics, where the sharing of tacit knowledge is crucial for the fulfillment of their missions. With this study, it was possible to understand the main gaps in this type of organizations in terms of increasing the lessons learned by sharing tacit knowledge and the main measures to be implemented in this sense. The difference in perspectives was clear between commanders, with the maximum responsibility in the management of these organizations, and for whom the failures in increasing lessons learned are greater and with more serious impacts and firefighters, mostly with voluntary ties, for those who share knowledge tacit tends to be a regular practice. It was also possible to present a performance matrix with concrete measures and actions to be implemented in these organizations, which lead to an increase in lessons learned by sharing tacit knowledge.

In addition to scientific interest, the study finds several other motivations. During 2017, two major fire events took place in Portugal, responsible for more than 500 thousand hectares of burnt area, the first between the 17th and 24th of June in the Municipalities of Pedrogão Grande, Castanheira de Pêra, Ansião, Alvaiázere, Figueiró dos Vinhos, Arganil, Góis, Penela, Pampilhosa da Serra, Oleiros and Sertã, where 64 people died and 490 homes and 50 industrial units burned, and the second, between 14 and 16 October, over 30 municipalities in the central region of Portugal, where 48 people died and where 521 industrial units burned, responsible for 4500 jobs.

These events refocused the importance of the activity of the FBs in matters of civil protection and launched a set of reflections with the civil society, which are linked, according to the Reports of the Independent Technical Commission for these events (Independent Technical Commission for the evaluation of the fires that occurred between 17 and 24 June

2017 in Mainland Portugal, Assembly of the Republic, 2017) and (Independent Technical Commission for the assessment of fires that occurred between 14 and 16 October 2017 in Mainland Portugal, Assembly of the Republic, 2018), with the need to provide these operators with greater knowledge, qualification and the need to adopt better governance practices in the Portuguese forest.

Thus, this article presents the results of research on the lessons learned by sharing tacit knowledge in Portuguese FBs, investigating the prevalence of the main indicators mentioned in the literature.

The article begins with a brief summary containing essential information about the objectives, the methodological approach, the main conclusions, the limitations of the research, and the originality or value of the aforementioned. Below is a brief introduction to the topic and keywords. Then the theoretical framework is presented, with emphasis on the lessons learned and the sharing of tacit knowledge. The next point deals with the presentation and discussion of the results. Finally, we present the conclusions and recommendations for future studies.

II. LITERATURE REVIEW

The focus of research in knowledge management has been centered essentially on the public and private sectors (Oliveira and Pinheiro, 2020) [3]. As a motivation for this impulse of research in the private sector, it can be suggested to equip knowledge management organizations to obtain competitive gains and in the public sector, the search for ways to reduce costs and improve efficiency (Ragsdell, 2013) [4]. The scarce work on Knowledge Management (KM) that addresses the NPOs, according to Ragsdell (2016) [5], is just the first step taken in an area that offers immense research opportunities.

The relevance of deepening knowledge management research directed at the third sector still increases, considering that, according to Fotler (1981) [6], organizations that operate in this sector operate in very dynamic and complex contexts, whose studies can lead to valuable conclusions about organizational behaviours. Among the references of environmental complexity in which the NPOs operate and which can influence the knowledge management process or strategy, we can find more abundantly in the literature, the reference to uncertainty and lack of financial stability (Phillips and Hebb, 2010) [7] and (Teruyo, 2010) [8]; the heterogeneity and ephemerality of human resources (Ragsdell, 2013 [4]); cultural specificity, (De Long and Fahey, 2000) [9] and (Oliver and Kandadi, 2006) [10] and the organizational structure (Webster and Wong, 2008) [11].

However, around the world, organizations have been implementing new techniques to improve the management of their intangible assets, characterized by knowledge and capacity for innovation, in order to obtain competitive advantages (Laranjo, P., 2018) [12]. It is in this context that the lessons learned have been gaining importance, constituting an essential process in the transfer of knowledge acquired by employees in knowledge poured into the organization, contributing to the continuous improvement of quality and the increase of its efficiency and effectiveness. Milton (2010) [13] explains that learning from experience is one of the basic activities of the human being and that the value of learning a lesson is to avoid a bad experience and repeat successful experiences.

The lessons learned are common knowledge management practices, from which organizations accelerate the individual and organizational learning process (McInerney and Koenig, 2011) [14]. Binney (2001) [15] concluded that the lessons learned are an integral part of knowledge management, which includes coding and improving inputs (observations, good practices, procedures or methodology) at work, implementing a strategy to identify, store, disseminate and reuse knowledge in the organization. The lessons learned are, therefore, a piece of knowledge or understanding acquired through experience, which can be positive, as a successful mission, or negative, as an accident or failure (Secchi et al., 1999) [16]. For these authors, the lessons learned must be significant, with real or assumed impact on operations; valid insofar as they deal with the factual and technically correct; and be applicable, capable of being implemented by processes or decisions. Considering the efforts to implement and use the lessons learned, with a view to increasingly effective knowledge management, as a continuous and regular process, we must then understand the lessons learned as omnipresent in organizations, since it favors the growth of individual and organizational knowledge (Weber et al., 2001) [17]. In this sense, the lessons learned have been addressed in organizations of different contexts in recent years with the capture, organization, dissemination and sharing of experiences and knowledge in projects and work processes (Guzzo, Maccari and Piscopo, 2012 [18]; Jugdev, 2012 [19]; Ferenhof, Forcellini and Varvakis, 2013 [20]; Guzzo, Maccari and Quoniam, 2014) [21].

The model of Socialization, Externalization, Combination and Internalization (SECI) by Nonaka and Takeuchi (1995) [22], was developed with the objective of formalizing a generic model of knowledge creation. Based on Polianyi's studies about the type of knowledge (division between explicit and tacit knowledge), these authors considered the

interaction between these two types of knowledge as basic units of analysis to explain the behavior of an organization. According to the SECI model, Socialization is understood as the moments of sharing and creating tacit knowledge through mental models and direct experiences between individuals, exclusively in the tacit form. The personal experiences that occur in an organization such as brainstorming, the relationship between master and apprentice, or informal conversations are examples of Socialization, where knowledge is kept in tacit form. According to the authors Nonaka and Takeuchi (1995) [22], this is the principle of knowledge creation, since this Socialization occurs through the sharing of tacit knowledge experiences between individuals, in a similar way to an orientation. Thus, when we started the exercise of integrating the lessons learned in the Nonaka and Takeuchi SECI Model (1995) [22], it appeared that for the organization, the processes of socialization and externalization are the most critical, as they deal with unregistered knowledge.

In short, the creation of new knowledge, through lessons learned in an organizational context, requires these to be effectively learned and implemented, meaning changes in organizational memory, continuous improvement of the organization and the capacity and motivation of each employee to learn and transform. Thus, in view of organizational learning through the increase of lessons learned by sharing tacit knowledge, according to Argyris and Schon (1978) [23], Duncan and Weiss (1979) [24], Castilho et al (2004) [25] and taking into account the specific characteristics of the NPOs under study, it is possible to determine the following set of indicators: analysis after significant operational events, internal sharing of the conclusions of that analysis, implementation of changes in procedures to follow these lessons learned, implementation of procedural changes that will incorporate operational instruction and the sharing of this learning with external operationally related entities and other FBs.

Table 1. Calculation of indicators of lessons learned.

Starting question	Reference authors	Indicator
Is there an analysis after a major operational event?	Argyris & Schon (1978) [23], Duncan & Weiss (1979) [24], Castilho et al. (2004) [25].	Analysis after the events occurred.
Are the conclusions (what went well and what went wrong) of this analysis shared within the fire department?		Internal sharing of analysis findings.
Are there any changes in the operational performance by learning from these events?		Procedural changes following these learnings.
Is this learning incorporated in the context of instruction?		Procedural changes now incorporate the instruction.
Is this learning shared with the outside of the organization?		The learning starts to be shared with the outside.

III. METHODOLOGY

For the execution of this study, the mixed sequential method was adopted, composed of two stages: the first qualitative and the second quantitative. The use of multiple research methods that combine the first two types of research such as qualitative and quantitative gives rise to the so-called mixed method of scientific research. According to Creswell (2009) [26], the mixed method arises, from the need to clarify issues and to promote the understanding of complex analyzes from the gathering of qualitative and quantitative data, in a single survey.

One of the most frequent qualitative approaches to data processing is called content analysis. According to Bardin (2006) [27], the content analysis procedures operate directly in the text or in the communication transcripts, being able to employ both qualitative and quantitative operations. Thus, in this stage of the investigation, the content analysis technique was used.

In the qualitative stage, interviews were conducted with 8 commanders of the Volunteer Fire Brigade, who are responsible for all operational management of the Volunteer Fire Brigade in Portugal, using the snowball technique. For conducting the interviews, a semi-structured interview guide was developed, with open questions. Care was taken to encourage respondents to reveal their own interpretations. For Yin (2005) [28], this condition is essential for the success of a case study, and may even indicate new sources of evidence.

For the quantitative part, after the pre-test of the structured and closed questionnaire, the questionnaire was applied to the firefighters of the same Volunteer Fire Departments whose commanders were the target of an interview, with the

exception of the Brasfemes Fire Department, whose answered questionnaires served for pre-test. The same questionnaire was also made available for online response, and 380 valid questionnaires were collected.

With the purpose of verifying the fulfillment or not of the specific objectives of this study, and in order to make it possible to present a performance matrix with a view to increasing the lessons learned by sharing tacit knowledge in the organizations under study, we proceeded to the crossing of qualitative and quantitative data.

IV. ANALYSIS AND DISCUSSION OF RESULTS

With regard to the assessment of lessons learned in the organizations under study, the first question aimed to determine whether there is an analysis after a major operational event, within said organization.

By analyzing the responses of the interviewees, it is possible to verify that this analysis is not usually done and that only a minority of the interviewees express themselves in the sense that in their organizations, this analysis is carried out. The main reasons given are centered on the lack of time that volunteers have to be present in these moments of analysis and on the culture in force in these organizations, which are related to habits and customs acquired over many years, which prevent the implementation of new ones. Strategies and measures aimed at creating moments for joint analysis. It is also possible to deduce from the arguments presented by the interviewees that firefighters do not recognize advantages in carrying out this analysis, since for this purpose, being mostly firefighters with a volunteer relationship, they would have to give up part of the time they have to carry out tasks related to your personal life.

In the questionnaire survey, it was found that the answer that most respondents gave was "I agree", with 163 answers (42.9%). The second answer that most respondents pointed out was "neither agree nor disagree", with 106 responses (27.9%). It should also be noted that 60 (15.8%) of the individuals claim to fully agree with this issue, while 44 (11.6%) claim to disagree. Finally, only 7 (1.8%) respondents claim to disagree completely. The average of the responses is 3.59, with a standard deviation of 0.950, with the modal value equal to 4, which corresponds to the "I agree" response hypothesis.

Then, it was intended to ascertain whether there is a sharing of the conclusions with all elements of the active body of the FB, resulting from the analysis of a remarkable operational event.

Following the testimonies collected, it is possible to ascertain that the majority of FBs do not share the conclusions of this analysis, with only 3 interviewees reporting that this is their practice. Most of the interviewees reported that there is no sharing of conclusions so that they reach all elements of the active body. It is possible to realize that when these efforts to share conclusions exist, they only reach the elements that were involved in the field operations and not the organization as a whole, or at least the active body, or it is done later, when the focus attention is no longer desirable. From the analysis of these testimonies, it is clear that the communication practiced in these organizations is ineffective or insufficient for the good sharing of the conclusions obtained in the analysis of significant operational events.

Regarding the questionnaires collected from firefighters, the results in this regard indicate that the answer that most respondents gave was "I agree", with 180 responses (47.4%). The second answer that most respondents pointed out was "neither agree nor disagree", with 78 responses (20.5%). It should also be noted that 62 (16.3%) of the individuals claim to fully agree with this issue, while 44 (11.6%) claim to disagree. Finally, only 16 (4.2%) respondents claim to disagree completely. The average of the responses is 3.60, with a standard deviation of 1.026, with the modal value equal to 4, which corresponds to the "I agree" response hypothesis.

The third question sought to determine whether there are any operational changes following the analysis of major events.

Following the testimonies collected, it is possible to verify that most FBs adopt attitudes, procedures and operational behaviors following the analysis of significant events. A minority of three respondents reported not doing so, with the main argument that it is something they intend to implement or devote more attention to in the future, so it is clear that these attitudes, procedures and operational behaviors can be seen as extra activities and intrusive to the natural the activities of these organizations.

In this regard, it is important to say that the answer that most respondents gave was "I agree", with 170 responses (44.7%). The second answer that most respondents pointed out was "neither agree nor disagree", with 114 responses (30%). It should also be noted that 60 (15.8%) of the individuals claim to fully agree with this issue, while 29 (7.6%) claim

to disagree. Finally, only 7 (1.8%) respondents claim to disagree completely. The average of the responses is 3.95, with a standard deviation of 0.899, with the modal value equal to 4, which corresponds to the "I agree" response hypothesis.

The fourth question of the lessons learned was intended to determine whether the learning referred to in the previous questions, which result from significant operational events, is incorporated and trained in the context of instruction or other specific training moments for the task.

Following the testimonies collected, it is possible to verify that there is a balance in the responses of the interviewees, since half of them affirm to apply this learning in the context of instruction and the other half affirm the opposite. Among the negative responses, we can find arguments about the fear of innovating or adopting new attitudes towards matters as sensitive as the provision of assistance. Above all, through the content analysis of the interviews, it is possible to perceive that the lack of trust in the knowledge of others and the privilege in the implementation of learning obtained through techniques of sharing explicit knowledge, such as documentary support, predominates. On the contrary, among the testimonies that point to the adoption and training of these learnings in the context of instruction or specific training for the task, we can point out the introduction of operational changes, in vehicles and other materials and techniques.

According to the data collected by questionnaire, the answer that most respondents gave was "I agree", with 176 answers (46.3%). The second answer that most respondents pointed out was "neither agree nor disagree", with 96 responses (25.3%). It should also be noted that 63 (16.6%) of the individuals claim to fully agree with this issue, while 36 (9.5%) claim to disagree. Finally, only 9 (2.4%) respondents claim to disagree completely. The average of the responses is 3.65, with a standard deviation of 0.945, with the modal value equal to 4, which corresponds to the "I agree" response hypothesis.

In the fifth question, it was intended to determine whether the learning referred to in the previous questions arising from the analysis of significant operational events, is communicated to the ANPC command structure or to other national bodies that relate to FBs, other FBs, or any other external entity to whom these learnings can also be useful.

Following the testimonies collected, it is possible to notice that no interviewee recognizes that this is the case. All the testimonies collected point to the contrary, in the sense that this sharing of learning is never done. Among the reasons for this, we can point out the inexistence of a hierarchically superior body to the commander of each FB, which, in some way, can promote the sharing of knowledge and learning in an operational context, of dealing with internal issues. Therefore, they should not be shared or, if they are mentioned with other entities, they are mere chance, in chance encounters between people who hold positions in these institutions, in which case we cannot consider this an intentional communication. It is also noticeable the fear of this sharing, in the sense that, the good practices and operational actions, which are only possible with a lot of training, dedication and accumulated knowledge on the part of the firefighters, should be the exclusive domain of which is dedicated to this training. According to the interviewees, if this sharing was done freely with other structures or FBs, the knowledge could easily be copied and what took a long time to acquire, should not be able to be easily copied by others.

Regarding the data collected by a questionnaire from the firefighters, the answer that most respondents gave was "neither agree nor disagree", with 162 responses (42.6%). The second answer that most respondents pointed out was "I agree", with 88 answers (23.2%). It should also be noted that 80 (21.1%) of the individuals claim to disagree with this issue, while 29 (7.6%) claim to disagree completely. Finally, only 21 (5.5%) respondents say they fully agree. The average of the responses is 2.98, with a standard deviation of 0.985, with the modal value equal to 3, which corresponds to the response hypothesis "neither agree nor disagree".

5.1 Summary of qualitative and quantitative results

In this way, from the analysis of the prevalence of the lessons learned in the follow-up of important operational events, and according to the testimonies of the interviewees, it is possible to perceive that they tend not to occur.

Table 2. Results obtained from interviews with commanders, related to lessons learned.

	Brasfemes	Anadia	Oliveira	Góis	Loriga	Penela	Guarda	Miranda

					Hospital										Corvo	
Lesson learned indicator	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No
Analysis after a landmark event	X			X		X		X		X	X			X		X
Sharing the findings of a landmark event	X		X			X		X		X	X			X		X
Changes in performance due to significant event	X		X			X		X	X		X			X	X		
Learning incorporated in instructional context		X	X			X		X	X		X			X	X		
Learning communicated to external structures		X		X		X		X		X		X		X		X

In summary, from the analysis of table 1., it is possible to verify that the FBs, according to the data collected from the commanders, tend not to retain lessons learned, in the sequence of remarkable operational events, which is in line with the trend of non-prevalence of tacit knowledge sharing indicators. Of the 5 items of analysis, only the "changes in performance by the analysis of a remarkable event" is implemented by the FBs, which means that the remaining 4 items of analysis of the lessons learned are not verified, which contributes to the difficulties of increasing organizational learning. Finally, it should be noted that there are 3 FBs (Oliveira do Hospital, Góis and Guarda), where none of the items of lessons learned are analyzed.

Through table 3, it is possible to perceive the tendency for agreement by the surveyed firefighters, regarding the indicators of lessons learned following major operational events.

Table 3. Survey results, related to the lessons learned indicators.

Lesson learned indicator	I totally disagree	I disagree	I don't even agree I don't even disagree	I agree	I totally agree
Analysis after a landmark event				X	
Sharing the findings of a landmark event				X	
Changes in performance due to significant event				X	
Learning incorporated in instructional context				X	
Learning communicated to external structures			X		

5.2. Actions and measures to increase the lessons learned by sharing tacit knowledge in the NPOs

Following the analysis of the results presented above, it was possible to develop a performance matrix, with a view to implementing a set of actions and measures in order to promote the lessons learned through the sharing of tacit knowledge in the organizations under study. For each indicator of the lesson learned, the main identified obstacles are presented, the reference authors who address these same obstacles in the literature and the corresponding measures to be implemented.

Table 4. Actions and measures to be implemented with a view to promoting lessons learned by sharing tacit knowledge.

Lesson learned indicator	Main obstacles identified	Reference authors	Actions and measures to be implemented
Analysis after a landmark event	Lack of time	Michailova e Husted (2003) [29]; Riege (2007) [30].	- Recognize the difficulties of time availability, share them with the whole organization and define periods of work break purposefully so that tacit knowledge sharing occurs. For example, reserve half an hour daily, during the shift change period between employees (day service) and volunteers (night picket) to facilitate these initiatives, which should cover all elements of the active body, regardless of their link to the institution. - Offer or improve existing social or social areas, eg. coffee room, bar, cafeteria, gym, games room, where people can meet and feel good, providing an increased sense of well-being in the FB, increasing their sense of belonging to the organization and informal contacts between elements of different hierarchies and between employees and volunteers. - Gather and share "success stories" that emphasize the importance of transferring tacit knowledge about explicit knowledge to individual and organizational learning and allowing firefighters to recognize time spent on this tacit knowledge sharing activity.
	Current culture	Sveiby (1997) [31]; Riege (2007) [30].	- Assess compliance with dimensions such as vision and mission, norms and customs, means to achieve goals, management processes, relationship with the external environment, image and reputation or any other aspect that affects the corporate culture of FB. - Extend knowledge sharing activities to elements of the entire organization, including the corporate values existing in the FB, in an attempt to change people at the expense of changing the organization as a whole. - Incorporate the knowledge sharing culture as a part of organizational policy. - Clearly communicate knowledge sharing policies to all firefighters, especially the newest members of the FB and incorporate this activity as part of the instruction or training to attend, for the benefit of the organization.
	Non-recognition of advantages	Riege (2007) [30].	- Providing tips and examples of real advantages, on how to share tacit knowledge on a regular basis, is beneficial for FB. - Promote regular sessions, face-to-face conferences or online discussion forums, where firefighters come together to solve problems and compare ideas and possible solutions to specific problems. - Promote and reward proactivity to firefighters, in terms of sharing tacit knowledge.
Sharing the findings of a landmark event	Insufficient or non-existent communication	Davenport e Prusak (1998) [2]; Hendriks (1999) [32].	- Guarantee the recruitment of firefighters with adequate communication skills, in order to try to get the best out of the firefighters that the FB already has in its active staff. - Provide training programs and development of communication skills appropriate to the FB activity. - Support an open communication flow between all FB organizational levels. - Encourage people to be open, proactive and close, without fear of contributing ideas and opinions. - Recognize and reward well done communication.
Changes in performance due to significant event	Extra and intrusive activity	Nonaka e Takeushi (1995) [22]; O'Dell e Grayson (1998) [33].	- Simplify the knowledge sharing mechanisms, using tools and natural processes, familiar to firefighters, that are consistent and in accordance with the style of activity they perform, such as, carrying out simulations in the places referred to as most likely to happen certain type of occurrence, in the territory under FB's own jurisdiction. - Identify and eliminate tasks that lead to wasted time or that are of low value to the organization, replacing those moments with others dedicated to sharing tacit knowledge.

			- If there is an absolute need for a longer period of time or hours of service to be spent by the fireman, so that he can enjoy the moments established for sharing tacit knowledge, recognizing and rewarding that time.
Learning incorporated in instructional context	Lack of confidence in the knowledge of others	Probst et al. (2000) [34]; Tiwana (2002) [35]; Lelic (2001).	- Identify which firefighters whose tacit knowledge is very important for the FB and present it as a credible specialist to support all other elements that can benefit from sharing their knowledge. - Promote the establishment of trust relationships between firefighters, through face-to-face and informal communication. - Demonstrate that the main sources of tacit knowledge are elements with high experience and credibility, that incorporate the best practices in their action and that reflect the wisdom of true specialists. - Encourage the elements of the command and leadership to promote direct and regular interaction between all firefighters in the active staff, not promoting the dynamics of groups that tend to close in on themselves. - Providing moments and opportunities for all elements of the active body to ask questions about knowledge sharing practices, and there should be no doubts to be clarified. - Recognize and reward the proactivity of sharing tacit knowledge and generating new ideas. - Ensure a non-bureaucratic communication flow between firefighters from different hierarchies.
	Preference for explicit knowledge	Nonaka e Takeushi (1995) [22]; O'Dell e Grayson (1998) [33]; Riege (2007) [30].	- Encourage and promote practical learning through learning-by-doing, through observation and dialogue or in an interactive way between those who teach and those who learn. - Increase awareness that tacit knowledge cannot be easily transferred, but that this is possible, demonstrating concrete ways of doing it and its benefits for firefighters and the FB. - Support the networks of stakeholders in each intervention area, existing inside and outside the FB, such as in the first aid area, involving doctors, nurses, and firefighters, so that standards of action can be discussed, based on best practices and that lead to tacit knowledge sharing among all stakeholders. - Emphasize the main means for the transfer of tacit knowledge, such as experiences, stories or demonstrations of know-how. - Provide time to share tacit knowledge.
Learning communicated to external structures	Afraid to share	De Long e Fahey (2000) [9]; Riege (2007) [30].	- Guarantee the commitment to the sharing of tacit knowledge by all elements of the command and leadership framework, so that they are the ones to take the initiative to share tacit knowledge. - Involve the elements of the active body, regardless of hierarchical position or link to the organization, at times of activity planning, for example, in the elaboration of scales of service to the night pickets and weekends, in the preparation of instruction or other initiatives of relief for the day to day of FB. - Make accessible to all elements of the active body, the results of works that are a consequence of sharing tacit knowledge, such as correct decisions, achieved skills, greater effectiveness or efficiency in operational tasks. - Establish individual objectives or goals and encourage the sharing of knowledge as something natural to achieve such objectives, such as, for example, the acquisition of competence in handling equipment, which should be facilitated if there is knowledge sharing between colleagues. - Introduce a real, tangible and differentiating reward for firefighters who transfer tacit knowledge, not opting, for example, for personal protective equipment that can be seen as something necessary for the provision of assistance, therefore, something that should already be guaranteed at the outset by the organization, or something that all other firefighters will eventually receive. - Implement an individual performance evaluation system, where one of the items under evaluation is the individual contributions to the sharing of tacit knowledge.

	Lack of taste for other FBs to copy us	Probst et al. (2000) [34]; Tiwana (2002) [35]; Lelic (2001) [36].	- Eliminate "information is power" attitudes. - Include in the FB principles and values, the sharing of tacit knowledge with other FBs or similar external entities, and practice them effectively. - Introduce a reward and recognition scheme to maximize knowledge sharing practices with firefighters from other FBs. - Provide formal and informal moments of conviviality and learning with firefighters from other FBs. - Encourage or apply collective decision-making processes, where and when appropriate.

V. CONCLUSIONS AND RECOMMENDATIONS

In order to ascertain whether there was a prevalence of lessons learned by sharing tacit knowledge within the FBs, following significant operational events, a set of five questions was drawn up leading to five indicators of lessons learned. The prevalence of each of these 5 indicators was attested by an interview with 8 commanders of FBs and by questionnaire, with 380 firefighters. From the analysis of the results, it was possible to conclude that there is no consensus of opinion on this topic, between commanders and firefighters, thus fulfilling the first objective of the present study.

While firefighters tend to agree with the prevalence of lessons learned by sharing tacit knowledge in the organizations under study, commanders tend to disagree.

The firefighters surveyed, agree with the prevalence of 4 of the 5 indicators of lessons learned presented, only "do not agree or disagree" with the indicator "learning communicated to external structures". The commanders interviewed disagree about the prevalence of most indicators of lessons learned in these organizations.

The main reasons given by commanders for pointing out the non-prevalence of lessons learned by sharing tacit knowledge focus on the following reasons: lack of time for sharing tacit knowledge; the culture in force in the organization that does not sympathize with these practices, the non-recognition of advantages in undertaking efforts to share this type of knowledge, the prevalence of insufficient or nonexistent communication in the organization under study, the perception that this knowledge sharing it is an extra and intrusive activity to the regular operational activity of firefighters, the lack of confidence in the knowledge that the other elements may present, the preference for explicit knowledge in documentary support, the fear of sharing the individual knowledge that they have due to the eventual loss of power within the organization because it is no longer the exclusive holder of this knowledge and, finally, the lack of taste in which the other FBs can imitate or copy the operational procedures and actions.

Such a discrepancy of opinions between commanders and firefighters, and according to the main reasons raised by commanders for not checking the prevalence of lessons learned by sharing tacit knowledge, there was an increased need to present a performance matrix that contemplated a set of concrete actions and measures that promote the sharing of tacit knowledge, fighting or eliminating the obstacles presented. Thus, the second objective of the present study was fulfilled, with the presentation of Table 3., which aims to serve as a practical guide for NPOs who intend to increase the prevalence of lessons learned by sharing tacit knowledge.

As recommendations, and since we are faced with NPOs, it is recommended to carry out studies that assess the impact of the prevalence of lessons learned, either by sharing tacit knowledge or by sharing explicit knowledge, on organizational performance, namely with regard to the fulfillment of their missions. It is also suggested to carry out studies with private and public sector organizations. A conclusion section must be included and should indicate clearly the advantages, limitations, and possible applications of the paper. Although a conclusion may review the main points of the paper, do not replicate the abstract as the conclusion. A conclusion might elaborate on the importance of the work or suggest applications and extensions.

REFERENCES

[1] Druker, P. (2003), A Functioning Society: Selections from Sixty-five Years of Wrinting on Community, Society and Polity. Transaction Publishers, New Brunswick (USA) and London (U.K.).

[2] Davenport, T. and Prusak, L. (1998). Working Knowledge: How Organizations Manage What They Know, Harvard Business School Press, Boston, MA, USA.

[3] Oliveira, M., and Pinheiro, P. (2020). Factors and Barriers to Tacit Knowledge Sharing in Non-Profit Organizations–a Case Study of Volunteer Firefighters in Portugal. Journal of the Knowledge Economy, 1-20.

[4] Ragsdell, G. (2013). "Voluntary Sector Organisations: Untapped Sources of Lessons for Knowledge Management", In Proceedings of the 10th International Conference on Intellectual Capital, Knowledge Management and Organisational Learning (ICICKM-2013), pp.349-354.

[5] Ragsdell, G. (2016). "Knowledge Management in the Not-For-Profit Sector: Introduction", Journal of Knowledge Management, ISSN: 1758-7484. DOI: 10.1108/JKM-11-2015-0483.

[6] Fotler, M. (1981). "Is management really generic?", Academy of Management Review, 6(1), pp. 1- 12.

[7] Phillips, S. and Hebb, T. (2010). Financing the third sector: Introduction. Policy and Society, 29(3), pp. 181- 187.

[8] Teruyo, O. (2010). Competition between charitable organisations for private donations. Unpublished PhD Thesis, Griffith University.

[9] De Long, D. and Fahey, L. (2000). "Diagnosing cultural barriers to knowledge management", Academy of Management Executive, 14(4), pp. 113- 127.

[10] Oliver, S. and Kandadi, K. (2006). "How to develop knowledge culture in organizations? A multiple case study of large distributed organizations", Journal of Knowledge Management, 10(4), pp. 6 – 24.

[11] Webster, J. and Wong, W. (2008). "Comparing traditional and virtual group forms: identity, communication and trust in naturally occurring project teams", International Journal of Human Resource Management, 19(1), pp. 41- 62.

[12] Laranjo, P. (2018). As Lições Aprendidas como parte integrante da Gestão do Conhecimento no atual contexto das Forças Armadas Portuguesas. Contributos para a sua melhoria.

[13] Milton, N. (2010). The Lessons Learned Handbook: Practical Approaches to Learning from Experience. Oxford: Chandos Publishing.

[14] McInerney, C. and Koenig, M., (2011). Knowledge Management (KM) Processes in Organizations: Theoretical Foundations and Practice. Chapel Hill: Morgan & Claypool.

[15] Binney, D. (2001). The Knowledge Management Spectrum – Understanding the KM Landscape. Journal of Knowledge Management, Volume 5 (1), pp. 33-42.

[16] Secchi et al. (1999). Proceeding of alerts and Lessons Learned: An effect way to prevent failures and problems, Noordwijk, The Netherlands: ESTEC - Techinical report Wpp-167.

[17] Weber, A. et al. (2001). Intelligent lessons learned systems: Expert Systems with Applications (pp. 17-34). s.l.:Elsevier Science Ltd.

[18] Guzzo, C., Maccari, E., and Piscopo, M. (2012). Sistematização de um modelo de lições aprendidas em projetos como contribuição à aprendizagem organizacional. Revista Gestão e Planejamento, Salvador, v. 12, n. 3, p.578-593.Guzzo, C., Maccari, E. and Quoniam, L. (2014). Indicadores da Produção Científica sobre Lições Aprendidas em Gestão de Projetos. Revista Gestão & Tecnologia, Pedro Leopoldo, v. 14, n. 2, p.5-24.

[19] Jugdev, K. (2012). Learning from Lessons Learned: Project Management Research Program. American Journal Of Economics And Business Administration, St. Albert, v. 1, n. 4, p.13- 12.

[20] Ferenhof, H., Forcellini, F. and Varvakis, G. (2013). Lições Aprendidas: Agregando Valor ao Gerenciamento de Projetos. Revista de Gestão e Projetos, [s.l.], v. 4, n. 3, p.197-209, University Nove de Julho. http://dx.doi.org/10.5585/gep.v4i3.172.

[21] Guzzo, C., Maccari, E. and Quoniam, L. (2014). Indicadores da Produção Científica sobre Lições Aprendidas em Gestão de Projetos. Revista Gestão & Tecnologia, Pedro Leopoldo, v. 14, n. 2, p.5-24.

[22] Nonaka I. and Takeuchi H. (1995). The knowledge creating company: how Japanese companies create the dynamics of innovation. Oxford: Oxford University Press.

[23] Argyris, C. and Schon, D. (1978). Organizational Learning. Reading, MA: Addison-Wesley.

[24] Duncan, R. and Weiss, A. (1979). Organizational learning: Implications for organizational design, in B. Staw (Ed.), Research in organizational behavior (pp. 75-123), Green- wich, CT: JAI Press.

[25] Castilho, N, Silva, C. and Turrioni, J. (2004). Aprendizagem organizacional e gestão do conhecimento, XI SIMPEP - Bauru, SP, Brasil.

[26] Creswell, J. (2009). Research design: Qualitative, quantitative and mixed method approaches, 3rd edition, Los Angeles: Sage Publications.

[27] Bardin, L. (2006). Análise de conteúdo, Edições 70, Lisboa.

[28] Yin, K. (2005). Estudo de caso planejamento e métodos, 3rd ed, São Paulo: Artmed.

[29] Michailova, S. and Husted, K. (2003). "Knowledge-sharing hostility in Russian firms", California Management Review, Vol. 45 No. 3, pp. 59-77.

[30] Riege, A. (2007). "Actions to overcome knowledge transfer barriers in MNCs", Journal of Knowledge Management, vol. 11, no. 1, pp.48-67.

[31] Sveiby, K. (1997). The new organizational wealth: managing and measuring knowledge- based assets, Berrett-Koehler, San Francisco.

[32] Hendricks, P. (1999). "Why share knowledge? The influence of ICT on the motivation for knowledge sharing", Knowledge and Process Management, v. 16, n. 2, p. 91-100.

[33] O'Dell, C. and Grayson, C. (1998). "If only we knew what we know: identification and transfer of internal best practices", California Management Review, v. 40 n. 3, p. 154-174.

[34] Probst, G., Raub, S. and Rombhardt, K. (2000). Managing Knowledge, John Wiley & Sons, Chichester.

[35] Tiwana, A. (2002). The Knowledge Management Toolkit, Prentice-Hall, Upper Saddle River, NJ, Vol. 19 No. 4, p. 53.

[36] Lelic, S. (2001). "Creating a knowledge-sharing culture", Knowledge Management, Vol. 4 No. 5, pp. 6-9.