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A Methodological Framework for Evaluating Knowledge Management in the Public Sector: A Case Study

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Abstract

Knowledge is an important tool that companies use worldwide to improve their efficiency. Managing knowledge has received considerable interest among researchers as it increases the performance of the organization. Since our time is recognized as the era of the knowledge economy, it is important, not only for private but also for public organizations, to understand the importance of Knowledge Management (KM) and to focus on implementing KM practices to achieve better efficiency and to improve the quality of the services provided. The employees of the Prefecture were chosen as case study. The purpose of this study is to investigate whether Knowledge Management (KM) activities are used in the Prefecture. This paper assesses whether specific characteristics of the employees affect their responses. This study also investigates how employees understand KM, its importance, its benefits and difficulties. A quantitative survey was selected to investigate KM in the Prefecture. The link of the questionnaire was emailed and completed online from 153 employees. The results show that employees' responses are affected by particular characteristics such as position of responsibility and years of service in the Prefecture. The findings also reveal that the majority of respondents ignore the existence of a KM Strategy in the Prefecture and associate KM with benefits such as *improvement of efficiency* and *response to customers' needs*. The study, which is the first in the Greek public sector, also provides valuable information about KM in the Prefecture as it presents a framework for the assessment of KM enablers.

Keywords - Knowledge Management (KM), Knowledge Management Enablers, Public Organizations, Prefecture of Eastern Macedonia and Thrace

1.INTRODUCTION

1.1 Background of the study

Most academics worldwide have accepted the importance of knowledge and its involvement in enhancing innovation and competitiveness (Nonaka, 1991; Drucker, 1993; Davenport and Prusak, 1998). Knowledge has become a valuable organizational resource that, if it is managed properly, will deliver competitive edge to the organization (Wong, 2005).

In the late 20th century, Knowledge Management (KM) attracted the attention not only of researchers but also of executives and, as a consequence, more and more companies adopted KM initiatives. As Harman and Brelade stressed, KM is the company's attempt to offer an environment where employees acquire, use, transfer and disseminate knowledge to create a competitive advantage for the firm (Harman and Brelade, 2000). In essence, the goal of these techniques is to gather, implement and disseminate knowledge within the organization (Davenport and Prusak, 1998).

Simultaneously, the significance of implementing KM initiatives in public has grown increasingly, as public services in many cases compete with private companies and non-governmental organizations. Moreover, public organizations provide job to a large number of people and their services target the whole of society. Thus, their performance is a major part of the country's performance. More so, public organizations must respond to changing needs and offer to customers effective and quality services.

The benefits from implementing KM activities are significant. Some of these are efficiency, cost reduction, competitiveness, performance improvement (McAdam and O'Dell, 2001). By doing so, public organizations have the opportunity to become from a dysfunctional mechanism into a pioneering organization.

However, many public agencies are not ready to apply KM techniques (Haynes, 2005). Bureaucracy and, in many cases, the organizational structure could be seen as some of the obstacles to their implementation.

1.2 Purpose of the study

The intention of the study is to conduce to the understanding of knowledge management and the significance of designing a KM strategy for the Prefecture in order to benefit from all the advantages that such a strategy can offer. Employees of the Prefecture through their responses to the questionnaire will have the opportunity to demonstrate their point of view and experiences. The study will provide valuable information about the KM in the Prefecture as it will present a framework for the assessment of KM enablers such as organizational culture, organizational structure, technology and people / human resources. Essentially, the purpose of the study is to examine the organizational enablers such as organizational culture, organizational structure, technology, human resources that affect the Knowledge Management in the Prefecture.

1.3 Aims and Objectives of the study

The aim of the study is to investigate whether KM activities are used in the Prefecture of Eastern Macedonia and Thrace (PEMT). The study also assesses whether specific characteristics of the employees affect their responses regarding the organizational enablers that influence KM in the Prefecture. To achieve this, specific enablers such as organizational culture, organizational structure, technology and human resources will be evaluated to see if they contribute to the transfer and dissemination of knowledge. In addition, the study investigates how employees: 1) understand Knowledge Management and its importance, 2) perceive the benefits, the difficulties and the barriers

of its implementation, 3) perceive the notions of knowledge transfer and explicit and tacit knowledge.

The objectives of the study are:

- Understand the significance of designing a KM strategy for the Prefecture
- Perceive the benefits, the difficulties and the barriers of its implementation
- Identify the enablers that that enable knowledge transfer and knowledge dissemination in the Prefecture
- Examine the importance of particular characteristics such as position of responsibility and number of years in the Prefecture in understanding KM.

1.4 Research Methodology

The Prefecture of Eastern Macedonia and Thrace was chosen as a case study. A large number of knowledge is handled daily by the employees of the Prefecture. However, many civil servants do not know how to manage, create, acquire, store, disseminate and use knowledge and information in their day-to-day work. A quantitative survey was selected to investigate KM in the Prefecture. An electronic questionnaire, distributed by email to the employees, was chosen as the best way to gather the primary data.

2.LITERATURE REVIEW

Nowadays, knowledge's importance to organizations, private or public, is well underlined and more and more companies are seeking to obtain it in order to achieve competitive advantage against their rivals (Makani, 2012). Many businesses invest huge amounts of money to have more brains than

hands in order to become knowledge intensive (Wong, 2005). As a consequence, knowledge is a crucial intangible asset for contemporary companies (Grant, 1996).

2.1 Tacit and Explicit Knowledge

It is evident from the literature that exists two types of knowledge, tacit and explicit (Wiig, 1993; Nonaka and Takeuchi, 1995; Nonaka and Konno, 1998). This distinction became well known thanks to Polanyi's work (Polanyi, 1958 and 1966). He argued that tacit knowledge represents the knowledge that is personal and hence difficult to be expressed by the individuals, while explicit knowledge is the codified one. With respect to tacit knowledge, he stated with dynamism that "we can know more than we can tell" and "we know how to do things without thinking of them" (Polanyi, 1958 and 1966).

On the basis of this distinction Wiig (1993) stated that some knowledge is recognized, documented and therefore explicit while some is tacit, so it is not well known and is likely to be used automatically (Wiig, 1993). Moreover, according to Smith (2001) tacit knowledge is local and we cannot find it in manuals and books. It acts automatically; most of the times without the need for reaction time and helps organizations to take decisions whereas explicit knowledge is the "know-what" that it is easily interchanged and assimilated through electronic devices, handbooks and formal means (Smith, 2001).

2.2 Knowledge Management

Knowledge is regarded as an intangible asset and, unlike tangible assets that when used tend to lose their value, knowledge increases when used over time and decreases when not used (Sveiby, 2001). Karadsheh *et al.* (2009) argued that Knowledge Management Process performs a significant role in successful contemporary firms. Such firms are considered the ones that give all the necessary

attention to knowledge and recognize that its use is an important weapon that delivers sustainability and competitiveness (Karadsheh *et al.*, 2009). According to Bassie (1997), KM Process consists of creating, acquiring, storing, disseminating and integrating knowledge within a company to enhance firm's performance (Bassie, 1997). In particular, the KM Process is presented below in the figure 2.2.

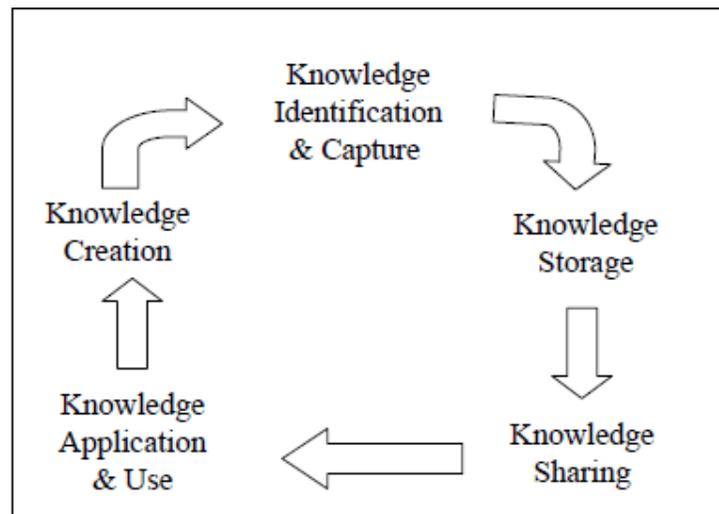


Figure 2.2 The conceptual framework: Knowledge Management Process

Source: Adopted from Xiaoming *et al.* (2007).

Knowledge Creation

Knowledge creation is defined as the constant ability of the firm and its employees to produce new knowledge by sharing tacit and explicit knowledge (Nonaka and Takeuchi, 1995). As Boisot and Canals (2004) assured, knowledge creation is the outcome of a process in which an employee relies on previous knowledge to generate new knowledge (Boisot and Canals, 2004).

Knowledge Acquisition

As reported by Darroch (2003), knowledge acquisition is associated to the creation or discovery of knowledge. She further stressed that a company can gather knowledge from different sources, for example, cooperating and interacting with other organizations. Another source of knowledge capture is the experience that employees bring from their previous firms (Darroch, 2003).

Knowledge Storage

Once the knowledge is acquired it should be stored for future use. Firms will have to deal very seriously with the storage of knowledge as it is necessary for the implementation of the KM process (Voon-Hsien *et al.*, 2013). In essence, as Armstrong (2006) opined, knowledge storage includes the recording of individual and organizational knowledge in software, hardware and any other technical systems for easy access to it (Armstrong, 2009).

Knowledge Sharing

Knowledge sharing is the processes of disseminating and distributing knowledge so as to be accessible to all the organizational members (Massa and Testa, 2009). The process of knowledge transfer involves two parts, the one that transfers the knowledge and the one that receives it. In order for the transfer to be successful, the parties involved, hence the employees of the firm, should be motivated to support the whole effort (Syed-Ikhsan, 2005). There are several ways that knowledge can be disseminated, such as interpersonal activities, meetings, training, seminars, publications and services and skills exchanged (Albino *et al.*, 1998).

Knowledge Use

The use of knowledge means that the firm applies all the acquired knowledge to its benefit (Dang and McKelvey, 2016). In other words, it is the application of the available knowledge to any product,

service or performed task. According to Al-Busaidi (2005), knowledge application is the integration of knowledge to find solutions to day-to-day problems and to facilitate the decision-making (Al-Busaidi, 2005).

At this point, it becomes clear that is very important for an organization to define its KM process in order to benefit from its implementation and achieve its objectives. However, this ends up being difficult and in many cases costly for some firms and should therefore be accompanied by an appropriate knowledge strategy. Thus, companies should establish methods and activities to support knowledge's recognition, its codification in documents and electronic devices and its distribution among the employees of the firm (Bennett and Gabriel, 1999). Such methods, according to Bennett and Gabriel (1999), are knowledge pools and inventories, company's libraries and encyclopedias as well as tools to disseminate knowledge like e-mails, video conferences, databases and Intranet.

2.3 Knowledge Management Enablers

Managing knowledge has a significant influence in contemporary firms. There is no doubt that many scholars examined the enablers that will foster knowledge management for both individuals and firms. However, in order to maximize knowledge's returns for the organization is essential to establish the strategic enablers that will influence knowledge management and will bring success.

Arthur Anderson Business Consulting (1999) stressed out that KM activities are mainly based on the organization and its members. As regard to organization, the key enablers are culture, structure and technology. With respect to people, "human resources" is the main enabler (Arthur Anderson Business Consulting, 1999). Some researchers characterize enablers as critical success factors and state that firms should recognize the enablers that will affect the firm's KM strategy (Davenport *et al.*, 1998; 2000; Hasanali, 2002; Wong, 2005). Monavvarian and Kasai (2007), trying to investigate a

KM model at the Ministry of Labor of Iran, they presented metrics as “organizational elements” and stressed out that: corporate structure and culture, technologies and human resources could be some of them (Monavvarian and Kasai, 2007). This study accepts the term of “enablers” and focuses on the determination of the following four (4) enablers: organizational culture, organizational structure, people / human resources and information technology. The literature concerning the above KM enablers are presented below.

2.3.1 Organizational Culture

Organizational culture, as many researches assured, is the enabler that most influences KM activities and knowledge creation and transfer (Chase, 1997; Davenport *et al.*, 1998; Gold *et al.*, 2001). Organizational culture includes all shared values, beliefs and assumptions learned or discovered by members of a firm through their efforts to cope with external or internal problems (Schein, 1985). Goh (2002) highlighted that a culture that enables knowledge sharing is strongly related with characteristics like collaboration, trust and innovative culture (Goh, 2002). As regard to collaboration, when employees who have common objectives and share similar problems support the exchange of ideas and the spirit of cooperation they encourage a knowledge friendly culture (Goh, 2002). As far as trust is concerned, lack of trust leads people not to have confidence of others and to be skeptical to transmit their knowledge to them. Supporting a relationship of trust between members will boost knowledge transfer and knowledge creation (Goh, 2002).

On the other hand, Smith (2001) observed that if there are no clear directives from managers that foster knowledge transfer, people share only their explicit knowledge (Smith, 2001). To what we are saying, Chua (2003) added that a common obstacle to knowledge transfer process is the lack of top management encouragement (Chua, 2003).

2.3.2 Organizational Structure

Organizational structure is the way individuals and tasks are performed in an organization (Davenport *et al.*, 1998). The structure of a firm encompasses of two characteristics: centralization and formalization (Grant, 1991). Centralization means that decision making and control remain in a specific location. As a consequence, creativity and expressiveness are drastically reduced. Therefore, as many researchers stated, centralized structures impede knowledge creation (Nonaka and Takeuchi, 1995). Formalization means that decision making and working environment follow formal rules and standardized policies (Chase, 1998). In such hierarchical structures new ideas are restricted and changes are made very slow. Thus, when flexibility interaction and communication increase, knowledge creation and knowledge dissemination are increased. A way to cope with this problem is to develop horizontal communication flows and cross-functional structures where all employees will be involved to the success (Goh, 2002). Furthermore, according to Schein (1985), communication among members is closely linked to organizational culture and structure, thus firms should try to break cultural boundaries by fostering such communication that will stimulate mutual understanding and dialogue (Schein, 1985). The measures to be taken will prevent tacit knowledge from staying in a certain number of employees (Lim and Klobas 2000).

2.3.3 People / Human Resources

Since people are the means by which firms achieve knowledge creation and knowledge sharing, then human resources are the key element in the creation and application of KM in an organization (Chase, 1997). As stated by Nonaka and Takeuchi (1995), firms should stimulate their members to disseminate their knowledge inside the organization. This is an important feature that contemporary companies must have as tacit knowledge, if is not fostered, it remains in the minds of individuals (Nonaka and Takeuchi, 1995). Therefore, companies should see their laborers as a significant

knowledge asset and continue motivate and reward them in order to maintain a valuable resource in their possession (Yeh *et al.*, 2006).

Many academics through their research have pointed out that reward programs and perks are essential in implementing KM activities (Davenport *et al.*, 1998; Liebowitz, 1999; Alavi and Leidner, 2001). Zaharias *et al.* (2001) pointed out that training employees, internally or externally, will give them the opportunity to practice their new knowledge in firm's tasks and routines (Zaharias *et al.*, 2001). Additionally, staff turnover is an issue in contemporary organizations. Lim and Klobas (2001) attested when a firm suffers from high staff turnover then organizations lose significant tacit knowledge (Lim and Klobas, 2000). A method of addressing this problem for a business is to introduce initiatives that will transform tacit knowledge into organizational knowledge (Syed-Ikhsan, 2005).

2.3.4 Information Technology

Information Technology (IT) is a vital part of the KM initiatives as it intervenes in the collection, recording, codifying and distributing of knowledge (Smith, 2001). When it comes to IT, mainly we refer to databases, networks, knowledge platforms, software and hardware systems. In essence, IT converts access, research, retrieval and transfer of knowledge into a fast and easy activity (Alavi and Leinder, 2001; Wong, 2005). Hence, it is important to identify and adopt the appropriate IT system taking into account the employees needs and the organization's objectives (Xiaoming and Kaushik, 2004). An IT system that focuses on integrate each individual's tacit knowledge, achieves to eliminate barriers in communication between departments (Gold *et al.*, 2001). Moreover, we should not forget that technology is a significant tool in the KM activities and not the solution to any problem (Wong and Aspinwall, 2003).

2.4 Knowledge Management in the Public Sector

Knowledge Management is a notion created to serve firms and is related to profits, competitive advantage and improved performance. However, more recently, it is also applied in the public sector and in non-profit organizations as well (Monavvarian and Kasai, 2007).

According to McAdam and O'Dell (2001), KM is important in the public agencies as it is proven that employees are the main knowledge repositories (McAdam and O'Dell, 2001). There is no doubt that the average age of civil servants is growing more and more and many countries face retirement problems, therefore the application of KM is indispensable (Edge, 2005). Applying KM initiatives in public sector, as in businesses, can improve collaboration among employees, communication, procedures and can promote knowledge creation and transfer (Monavvarian and Kasai, 2007).

Although there is increased attention towards the use of KM practices in the public sector, there are many issues that need to be clarified. As Svieby and Simons (2002) stated culture resistance and accumulation of knowledge are the main challenges that public agencies face (Svieby and Simons, 2002). In addition, as Murray (2001) mentioned, a significant problem is the coexistence of many operating systems between different organizations (Murray, 2001). As Massaro *et al.*, (2015) pointed out, civil servants, in particular those responsible for the KM strategy, should take account of the general framework operated by public bodies and the fact that public sector objectives are very different than in the private sector (Massaro *et al.*, 2015).

It is true that much of the research focuses on the private sector, as the results of KM activities are more easily quantifiable. This is quite explicable if we consider that public agencies focuses more on serving the general public than on seeking profits. Some of the researches that examined the implementation of KM initiatives in the public sector are presented below:

Shields *et al.* (2000) studied the KM initiatives in the Canadian Federal Services and founded that that the initiatives have the same effects on distinct civil servants and separate groups of citizens

(Shields *et al.*, 2000). Al-Athari and Zairi (2001) presented the KM system in both public and private sector of Kuwaiti. The research has shown that both sectors confirm that KM system is essential for the improvement of the organizations and argued that the most influential enabler in transferring knowledge among members is internal journals (Al-Athari and Zairi, 2001). Wiig's investigation (2002) into public bodies has revealed that KM must be complete in order to achieve both people and institutions acting in favor of the quality of life of citizens (Wiig, 2002). Liebowitz and Chen (2003) studied the impact of KM in creating a knowledge sharing culture in the public sector. They reported that public agencies are highly bureaucratic and hierarchical and as a consequence there are many problems in knowledge dissemination (Liebowitz and Chen, 2003). Syed-Ikhsan and Rowland (2004b) studied the KM in the Ministry of Entrepreneur Development of Malaysia and founded that although there is no precise KM strategy, knowledge plays a key role in the processes and policies of the Ministry and, according to many employees, KM strategy is drawn by the top management level (Syed-Ikhsan and Rowland, 2004b). Finally, the study of Monavvarian and Kasaei (2007) in the Ministry of Labor in Iran, shown that the most significant enablers for KM in the Ministry are: culture, technology and training (Monavvarian and Kasaei, 2007).

3. RESEARCH METHODOLOGY

3.1 Research Design

The aim of this research is to present the framework of Knowledge Management in PEMT. Namely, the study assesses whether specific characteristics of the employees, such as *position of responsibility* and *years of service in PEMT*, affect their responses regarding the organizational enablers that influence KM in the Prefecture. In addition, the study aims to get an insight on how employees understand KM and how they perceive the benefits and difficulties of its implementation. To achieve this, specific enablers such as organizational culture, organizational structure, technology

and human resources will be examined to see if they contribute to the transfer and dissemination of knowledge. For the purposes of this study, a descriptive research and specifically a questionnaire survey method, was used to gather data from participants.

3.2 Questionnaire

A self-administrated mail questionnaire was selected as the key tool for the gathering of data, as it allows participants to take their time before answering the questions and, at the same time, not to feel pressure from the presence of the interviewer. More so, this type of questionnaire is appropriate in order to gather significant responses in a shorter time (Powell, 1999).

The questionnaire is based on the questionnaire used by Syed-Ikhsan and Rowland (2004a) in their research with entitled "*Benchmarking Knowledge Management in a Public Organization in Malaysia*". The same questionnaire was used to implement Komanyane's (2010) dissertation on KM practices in the public sector of Botswana.

Questionnaire design

The questionnaire consists of 32 questions and it is separated into three parts. The first part (Q1-Q6) aims to gather information about participant's personal background. Respondents are encouraged to declare their demographic and professional background. In particular, it collects information about gender, age, educational level, position of responsibility, years of service in PEMT, years of service in the current position. The second part (Q7-Q22) consists of 16 questions about getting an insight on how employees: 1) understand KM and its importance, 2) perceive the benefits, the difficulties and the barriers of its implementation, 3) perceive the notions of knowledge transfer and explicit and tacit knowledge. The third part (Q23-Q32) examines the hypothesis tests of the dissertation, i.e. whether

specific characteristics of the employees affect their responses regarding the organizational enablers that influence KM in the Prefecture.

Questions format

The questionnaire consists of closed-ended and five-item Likert scale questions. Specifically, for the first part of the questionnaire, closed format questions were used. For the second part, a combination of closed format questions and five-item Likert scale questions were used. Finally, for the third part, only five-item Likert scale questions were used. The given scales for this section were “strongly disagree”, “disagree”, “neutral”, “agree”, “strongly agree”.

Questionnaire directives

The introduction of the questionnaire provides the respondents with the necessary information about the research and informs them that their response is anonymous and confidential. To make the participant fully understand what Knowledge Management means, a definition was given at the beginning of the questionnaire.

3.3 Target Population, Sample Process, Data Collection and Process

Target Population

Without a doubt, a large number of knowledge and information is handled daily by the employees of the Prefecture. However, many civil servants do not know how to manage, create, acquire, store, share and use knowledge and information in their day-to-day work. In addition, the Prefecture may be unaware of who needs knowledge, what kind of knowledge are held by other public organizations

in Greece and how it can be disseminated to those who wish to acquire it. The employees of PEMT were chosen as case study. The Region of Eastern Macedonia and Thrace consists of five Regional Units: the Regional Unit of Drama, the Regional Unit of Kavala, the Regional Unit of Xanthi, the Regional Unit of Rhodope and the Regional Unit of Evros. For this study, the target population (according to the Human Resource Department) is 1052 employees. The following table shows an analysis of the target population.

Table 3.3 Total Population

Regional Units	Number of Employees	Percentage
Regional Unit of Drama	220	20.9%
Regional Unit of Kavala	163	15.5%
Regional Unit of Xanthi	184	17.5%
Regional Unit of Rhodope	198	18.8%
Regional Unit of Evros	287	27.3%
Total Number of Employees	1052	100%

Source: HR Department of the Prefecture of Eastern Macedonia and Thrace

Sample Process

As Mugenda and Mugenda (2003) reported, when the population is less than 10,000, a sample size between 10% and 30% is sufficient to represent the population (Mugenda and Mugenda, 2003). As

mentioned, the target population was 1052 employees and since a sample of 10% is acceptable then $1052 * 10\% = 105$ responses are acceptable. The survey was conducted between 21/01/2019 and 04/02/2019 and 153 employees of PEMT responded. As a consequence, according to Mugenda and Mugenda (2003) the sample is representative of the target population ($153 > 105$).

The link of the questionnaire was emailed and completed online. The e-mail addresses of the participants were taken from the official PEMT website. Participants throughout the collection period were free to contact the author in case of technical issues and possible questions.

Data Collection

Primary data is information collected in accordance with specific procedures for a specific survey (Hox and Boeije, 2005). This research is based on primary data. Primary analysis gives the researcher the opportunity to gather data throughout the study (Hox and Boeije, 2005). The form of this research is time consuming, but with the extensive use of the Internet this is no longer a problem, as the Internet reduces the response time and increases the sample size (Halikias *et al.*, 2015).

The responses were collected and stored automatically, so entry errors were avoided. Thus, all questionnaires were completed and sent correctly. Nevertheless, a limitation of research is that some employees, such as elders or manual workers, do not have access to the internet. Therefore, their participation in the study was not possible.

Data Collection

In addition, all data collected was analyzed using IBM SPSS (version 24) software. Descriptive and inferential statistics were used to analyze the data. Specifically, cross tabulations, frequencies, percentages, means and standard deviations were computed for the descriptive analysis. The Mann-Whitney U test was used to perform inferential analysis and test the hypotheses.

4. RESEARCH FINDINGS

4.1 Descriptive Analysis

A summary of the employees' opinion gives some important findings of the survey. More specifically, the vast majority of employees (96.7%) seems to ignore the existence or do not believe that there is a KM Strategy in the Prefecture although they recognize its importance. Moreover, PEMT members associate KM with benefits. The majority believes that among the most important benefits in managing knowledge are to *improve efficiency* and to *respond to customers' need*. On the other hand, there are different opinions in updating the information (59.5%) while they do not seem to be interested in responding to organizations' need (37.3%) and to instigate changes (39.9%). The latter is disappointing if we consider that in order to make some changes, cultural, structural or technological, the first step is to recognize the need for changes. The responses regarding KM benefits are presented below:

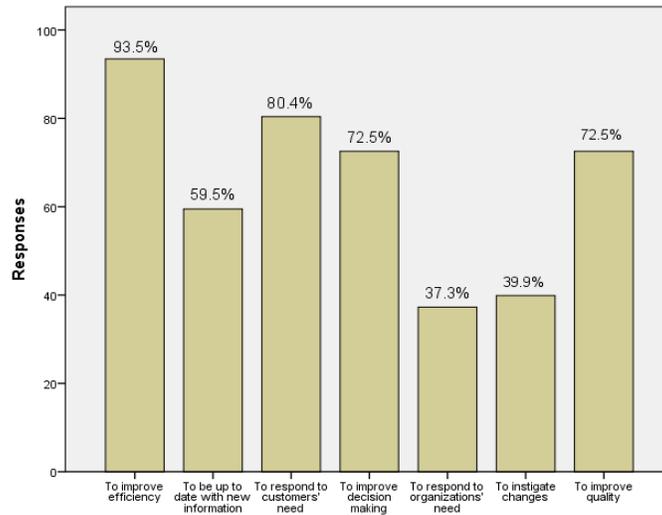


Figure 4.1 Benefits in Managing Knowledge

In addition, the issue that is considered to be the most difficult to address in PEMT as stated by employees is *changing employee behavior*. According to the authors, this seems to be one of the biggest pathogens of the Greek public sector. Furthermore, employees recognize that technologies such as *Internet* and *Online information* sources are very important with almost 80-83%, while *Intranet* and *video conferencing* are less important. Regarding knowledge transfer, almost 70% of the employees believe that knowledge is not assessed and exchanged very fast with other divisions.

With respect to organizational enablers the main points are that: Prefecture’s culture does not encourage the knowledge communication (89.6%, mean=2.34), its ICT infrastructure is not very up-to-date (85%), employees do not receive adequate training for ICT software (90.8%, mean=2.34) and there is a lack for preserving knowledge when officers leave the Prefecture (93.5%, mean=2.22). On the other hand, the Prefecture is bureaucratic and is tough to transfer knowledge (74.5%, mean=3.85), ICT facilitates searching for information (77.2%, mean=3.89) and ICT support employees’ daily work (66%, mean=3.73). The results are presented below:

Table 4.1 Distribution of Organizational enablers

	strongly disagree		disagree		neutral		agree		strongly agree		Mean	St. Dev
	Count	%	Count	%	Count	%	Count	%	Count	%		
Q23: The culture of the Prefecture encourages and provides opportunity for the communication of ideas, knowledge and experiences among all employees throughout the organization	30	19.6 %	59	38.6 %	48	31.4 %	14	9.2 %	2	1.3%	2.34	.940
Q26: The organization is very bureaucratic and makes it difficult to share knowledge	1	0.7 %	14	9.2 %	24	15.7 %	82	53.6 %	32	20.9 %	3.85	.879
Q27: The Prefecture has a very up-to-date ICT infrastructure which helps knowledge creation and sharing	11	7.2 %	67	43.8 %	52	34.0 %	23	15.0 %	0	0.0%	2.57	.833

Q27: ICT can speed up your work in searching for information	2	1.3 %	7	4.6 %	26	17.0 %	89	58.2 %	29	19.0 %	3.8 9	.807
Q27: ICT facilitates employees in doing their daily work	3	2.0 %	14	9.2 %	35	22.9 %	71	46.4 %	30	19.6 %	3.7 3	.948
Q29: All employees are given adequate training internally to use ICT tools (software) in the Prefecture	18	11.8 %	81	52.9 %	40	26.1 %	12	7.8 %	2	1.3%	2.3 4	.836
Q32: The Prefecture has procedures to retain the knowledge and know-how of officers who leave the Region	32	20.9 %	65	42.5 %	46	30.1 %	10	6.5 %	0	0.0%	2.2 2	.852

4.2 Inferential Analysis

As stated before, the aim of this research is to examine whether the *position of responsibility* and the *years of service in PEMT* affect the answers of the employees in relation to the organizational enablers that influence KM in the Prefecture. Therefore, *position of responsibility* and *years of service in PEMT* are the independent variables in the research, and the organizational enablers: *organizational culture, organizational structure, technology* and *human resources* are the dependent variables.

The Mann-Whitney U test is used to examine whether exist relation between the categorical (independent) variables and the ordinal (dependent) variables.

4.2.1 Hypotheses & Findings

The hypotheses statements examined by the study will be presented for both independent variables, namely for *position of responsibility* and *years of Service in PEMT*. The significance level in all hypotheses tests was set to $\alpha = 0.05$ ($p \leq 0.05$).

Position of responsibility:

H₁: "Position of responsibility" affects employees' responses regarding document confidentiality status

H₂: "Position of responsibility" affects employees' responses regarding ICT tools

H₃: "Position of responsibility" affects employees' responses regarding ICT Know-how

H₄: "Position of responsibility" affects employees' responses regarding training programs

Years of Service in PEMT:

H₅: "Years of service in PEMT" affects employees' responses regarding document confidentiality status

H₆: "Years of service in PEMT" affects employees' responses regarding ICT tools

H₇: "Years of service in PEMT" affects employees' responses regarding ICT Know-how

H₈: "Years of service in PEMT" affects employees' responses regarding training programs

Position of responsibility:

Table 4.2.1.1 shows the results with Sig value < 0.05 of the Mann-Whitney U test for the four dependent variables related to *position of responsibility*. Specifically, it is tested whether employees' responses differ according to the level of responsibility of their position.

From the results it is observed that Sig value is smaller than the significant level $\alpha=0.05$ in three cases, namely for questions Q25 (Sig=0.048, $z=-1.980$), Q28 (Sig=0.012, $z=-2.521$) and Q29 (Sig=0.034, $z=-2.122$). Consequently, the alternative hypotheses H_1 , H_2 and H_3 are accepted and H_4 is rejected. Thus, the findings point out that there is significant difference in employees' beliefs according to their *position of responsibility* for document confidentiality status, ICT tools and ICT

know-how. In other words, the scores in the specific organizational enablers vary between employees holding a position of responsibility and those who do not hold.

Similar tests were conducted for questions Q23, Q24, Q26, Q27, Q30, Q31 and Q32 and Sig value is greater than 0.05. Consequently, for the above questions the answers of the employees do not differ according to the level of responsibility of their position.

Table 4.2.1.1 Mann-Whitney U test for *position responsibility*

	Mann-Whitney U	Z	Asymp. Sig. (2-tailed)
Q25: Procedures, routines and policies that restrict officers to access certain knowledge give problems to create and shared knowledge	2034.500	-1.980	.048
Q28: Email is used to share information between officers	1905.000	-2.521	.012
Q29: All employees are given adequate training internally to use computers in the Prefecture	1998.500	-2.122	.034

The Table 4.2.1.2 presents the Mean Rank of the questions with Sig<0.05 for the independent variable *position of responsibility*.

Table 4.2.1.2 Mann-Whitney Mean Rank Table for *position of responsibility*

	Group	N	Mean Rank	Sum of Ranks
Q25: Document Confidentiality Status Procedures, routines and policies that restrict officers to access certain knowledge give problems to create and shared knowledge	1	106	72.69	7705.50
	2	47	86.71	4075.50
	Total	153		
Q28: ICT Tools Email is used to share information between officers	1	106	71.47	7576.00
	2	47	89.47	4205.00
	Total	153		
Q29: ICT Know-how All employees are given adequate training	1	106	72.35	7669.50
	2	47	87.48	4111.50

internally to use computers in the Prefecture	Total	153		
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With respect to the enabler *document confidentiality status*, as Bennet and Bennet (2003) mentioned, organizations with hierarchical structures incline to rely on closed collaboration where information is preserved in order to retain stability (Bennet and Bennt, 2003). In the Greek Public Sector documents are classified into “unclassified documents”, “confidential documents”, “private documents” and “highly confidential documents”. As a consequence, specific information is not provided to all employees and this could be a barrier for knowledge dissemination between employees and divisions. From the Table 4.2.1.2, looking at the mean rank score of the two groups, it is ascertain that employees with position of responsibility agree more that certain procedures that limit officers to approach certain knowledge cause problems to acquire and transfer knowledge. This is certain if we consider that classified documents are handled almost exclusively by officers with position of responsibility.

Regarding the enabler *ICT tools* Table 4.2.1.2 stresses once again that employees with position of responsibility accept more the use of email to share information between officers. Organizations that systematically apply technologies are more efficient and perform better (Bennet and Bennt, 2003). The accomplishment of KM relies, to a great extent, on the availability of ICT tools. The results reflect that there is a need for direct communication between the superiors and that the rapid exchange of experiences to deal with possible problems can really help.

Concerning *ICT know-how* and in particular the lack of adequate training in computers, officers give more importance than subordinates. This could be credited to the fact that officers are regularly older in age, which means they are less familiar with computers. As Syed-Ikhsan (2005) stressed, the success of KM initiatives depends on the dissemination of knowledge through computers.

Employees that are capable to manage ICT are able to share knowledge more accurate and reliability (Syed-Ikhsan, 2005).

With regard to the other organizational enablers, according to the results, there are no differences between the two groups of employees. However, it is noteworthy to stress that, regarding ICT infrastructure, many academics pointed out its importance (McAdam and O'Dell, 2001; Teece, 2003) in order to create, acquire, storage, transfer and use knowledge across the organization. With respect to sharing culture, researchers stated that organizations with solid sharing culture perform better and gain competitive edge (Clarke, 2001; Levine, 2001; Liebowitz and Chen, 2003). In this study the findings show that these enablers are not significant.

Years of Service in PEMT:

Table 4.2.1.3 presents the findings with Sig value < 0.05 of the Mann-Whitney U test for the four dependent variables regarding the independent variable *years of service in PEMT*. Specifically, it is tested whether the responses of the employees are different according the years of service in PEMT.

The findings, show that only *Training program* (Q31) is significant (Sig=0.016, $z = -2.406$) and influenced by the years of service in PEMT. As a consequence, the alternative hypothesis H_8 is accepted and H_5 , H_6 , H_7 are rejected. Namely, the results point out that there is significant difference in employees' beliefs according to *years of service in PEMT* for *Training program*. In other words, the score in the specific organizational enabler vary between employees working in the Prefecture for more than 10 years and employees who have been working for less than 10 years.

Similar tests were conducted for questions Q23, Q24, Q26, Q27, Q30, Q31 and Q32 and Sig value is greater than 0.05. Consequently, for the above questions the answers of the employees do not differ according to the *years of service in PEMT*.

Table 4.2.1.3 Mann-Whitney U test for *years of service in PEMT*

	Mann-Whitney U	Z	Asymp. Sig. (2-tailed)
Q31: The Prefecture provides opportunities for the employees to attend training internally/externally in other fields which can enhance their knowledge	1567.000	-2.406	.016

The Table 4.2.1.4 that follows presents the Mean Rank for the enabler *Training programs* (Q32) where Sig value is smaller than 0.05 and consequently is significant for the independent variable “Years of service in PEMT”.

Table 4.2.1.4 Mann-Whitney Mean Rank Table for years of service in PEMT

	Group	N	Mean Rank	Sum of Ranks
Q31: The Prefecture provides opportunities for the employees to attend training internally/externally in other fields which can enhance their knowledge	1	36	62.03	2233.00
	2	117	81.61	9548.00
	Total	153		

As stated by Smith (2001), employees’ performance is closely linked to training. For those employees who do not participate in programs their career in the organization is uncertain (Smith, 2001). Holsapple and Singh (2003) stated that when employees receive training they essentially generate knowledge that, by returning to the organization, they apply it for the benefit of the company (Holsapple and Singh, 2003). According to the Table 4.2.1.4 employees who have been working for more years in the Prefecture are more in agreement that the Prefecture provides training programs to its members in areas other than their duties in order to enhance their knowledge. This could be justified, as these group of employees, as time goes by, has more and more opportunities to apply for different and often more experienced jobs. This also results that the Prefecture supports knowledge creation and sharing by spending resources and time. The importance of training is supported from many authors who claimed that adequate training enhance organization’s tacit and explicit knowledge (Smith, 2001; Holsapple and Singh, 2003; Boland and Yoo, 2003).

5.DISCUSSION ANALYSIS

Discussion of the Descriptive Statistics

The descriptive analysis shows some aspects of the respondents regarding KM in the Prefecture, its effectiveness, the benefits and the difficulties as well as the enablers influencing it.

The results show that the majority of respondents ignore the existence of a KM Strategy in the Prefecture although they recognize its importance. The results seem to be in line with the findings of the Al-Athari and Zairi (2001) study on KM in public and private organizations in Kuwaiti and Syed-Ikhsan and Rowland (2004) at the Ministry of Entrepreneur Development in Malaysia. Both studies have shown that respondents considered KM to be highly important for organizations (Al-Athari and Zairi, 2001; Syed-Ikhsan and Rowland, 2004). The author believes that the results demonstrate the scarcity of resources, the lack of a vision and mission statement. A suggestion would be to allocate resources towards KM strategy and to disseminate it to all members.

Furthermore, PEMT employees associate KM with benefits such as “improve efficiency” and “respond to customers’ need”. The former benefit is supported by the results of the survey of McAdam and O’Dell (2001) in both public and private sector (McAdam and O’Dell, 2001). Communicating the benefits of KM to the members and encouraging the exchange of knowledge are proposals cited by many researchers (Bhatt, 2002; Goh, 2002). With respect to the benefit “respond to customers’ need” offering innovative services that avoid and reduce customer hassle are suggestions mentioned in the literature (Sindakis *et al.*, 2015).

On the other hand, employees also recognize the difficulties that needed to be addressed, namely “changing employee behavior”. The findings are in line with the researches of Syed-Ikhsan and Rowland (2004) and Al-Athari and Zairi (2001). In both researches the employees found that the most difficult concern to be dealt with is “to change their behaviors” (Al-Athari and Zairi,

2001; Syed-Ikhsan and Rowland, 2004). The researcher considers that the difficulty to manage “employees’ behavior” is one of the biggest pathogens of the Greek public sector. It would be wise for the Prefecture to find ways to motivate its employees through support, better communication flow and greater involvement in decision-making (Schalk *et al.*, 1998).

With respect to the organizational enablers the overall findings are: 1) Prefecture’s culture does not encourage the knowledge communication, 2) its ICT infrastructure is not very up-to-date, 3) employees do not receive adequate training, 4) there is a lack for preserving knowledge when officers leave the Prefecture, 5) the Prefecture is bureaucratic and it results tough to disseminate knowledge and 6) ICT facilitates searching for information and support employees’ daily work.

The researcher believes that it would be thought-provoking to explore whether variations in the responses regarding “culture” could be made after the implementation of the Law on postings in the public sector. Bogdanowicz and Bailey (2002) stated that laborers from other organizations pass their experiences, knowledge and education to the new organizations (Bogdanowicz and Bailey, 2002). Regarding the fact that “ICT infrastructure is not very up-to-date” the findings are similar with the results of McAdam and O’Dell (2000) survey. As mentioned by Syed-Ikhsan (2005) ICT infrastructure fosters employees to create and disseminate knowledge effectively, hence Prefecture should invest in improving its ICT infrastructure (databases, softwares, networks) (Syed-Ikhsan, 2005). With respect to “adequate training for employees”, as mentioned by many academics (Zaharias *et al.*, 2001; Smith *et al.*, 2001), exist a significant relationship among training and performance. Thus, the Prefecture should support employees’ training on computers by offering them the opportunity to participate in training programs of the National Centre for Public Administration and Local Government (EKDDA). In this way, it will encourage the transfer of knowledge throughout the Prefecture and will transform its members into knowledgeable employees. Concerning the difficulty of retaining knowledge when officers leave the Prefecture, as supported by

many authors (Lim and Klobas, 2000; Bogdanowicz and Bailey, 2002), when employees leave the organization, tacit knowledge is lost for the firm, unless the firm has turned the tacit knowledge to explicit knowledge for the organization. Hence, the Prefecture should promote the dissemination of knowledge through its daily procedures and routines (databases, networks, knowledge platforms, software, videoconferences). Respecting the employees' statement that the Prefecture is very bureaucratic, the results are in line with study of Ondari-Okemwa and Smith (2009) in public agencies in Kenya (Ondari-Okemwa and Smith, 2009). The study, which focuses on the role of KM in the public sector, revealed that the agencies are very hierarchical, bureaucratic and rigid in their procedures. The above characteristics are observed in the majority of the Greek public sector. Greek civil servants have the feeling that there is lack of participation in decision-making, their performance is not measurable and the assessment of their work cannot be based on objective criteria (abstinence from the evaluation process in the public sector in recent years). Hence, the Prefecture should introduce a) delegation of authority and b) incentives to the employees to achieve bigger participation and alignment with the goals of the Prefecture.

Discussion of the Inferential Statistics

The inferential analysis revealed the organizational enablers that are affected by the *position of responsibility* and the *years of service in PEMT*. Comparisons are difficult to be made, as there are no similar studies that test these independent variables.

The enablers that vary between employees' position of responsibility are: 1) document confidentiality status, 2) ICT tools and 3) ICT know-how. The analysis shows that employees with position of responsibility they agree more that concrete procedures restrict officers to access certain knowledge. As we mentioned before, specific information is not provided to all employees and this could be a barrier for knowledge dissemination. Classified documents are handled almost exclusively

by officers with higher position of responsibility, and therefore they assert that this process is negatively related to knowledge sharing. Consequently, the Prefecture should try to minimize the use of confidential documents in order not to restrict important information from all members. Concerning the lack of proper training in computers by officials in positions of responsibility, this may be due to the fact that officials are usually elderly, which means they are less familiar with computers. The Prefecture should enhance the training of officials on computers in order to simultaneously achieve both experienced and technologically advanced employees. Regarding the fact that superiors support more the use of email between officers in order to share information, the results reflect the need for direct communication between officers and the rapid exchange of experiences to deal with possible problems. The Prefecture, as Bennett and Gabriel (1999) mentioned, should encourage the use of knowledge pools, inventories and encyclopedias to promote knowledge dissemination.

On the other hand, the enabler that is influenced by the years of service in PEMT is training program. Employees with more than 10 years in PEMT claimed that the Prefecture provides training programs to its members in areas other than their tasks to augment their knowledge. The importance of training is supported from many authors who claimed that adequate training enhance organization's tacit and explicit knowledge (Smith, 2001; Holsapple and Singh, 2003; Boland and Yoo, 2003). The results demonstrate that officers have more and more opportunities to apply for different and often more experienced jobs. This also results that the Prefecture supports knowledge creation and sharing by spending resources and time.

6.CONCLUSION

Summarizing it should be noted the need for the Prefecture to evolve a Knowledge Management Strategy and to integrate it into the framework of its General Strategy. Thus, the Prefecture will support its mission statement, hence the official objectives and values of the organization. The

benefits for its implementation are reported by many academics. Firstly, the organization will enhance the quality of the services provided and will thus be able to respond better to the growing needs of citizens (technological revolution, demographic changes, ageing of population). Secondly, it will improve its performance and become more competitive. In this way it will fulfill a large part of his mission statement. At this point, it is significant to stress that the human resources of the Prefecture, the employees and the managers, should help in this endeavor. In essence, their involvement and endorsement to the KM strategy will be crucial to its accomplishment.

Therefore, in order to introduce a successful KM strategy, the Prefecture should articulate correctly the strategy and disseminate the plan to all members of PEMT. It should increase employee awareness by indicating the goals and benefits of the strategy being implemented. It should also ensure: a) the participation of all employees by establishing a reward system, b) the strong engagement of top managers, including the Regional Governor, c) the allocation of valuable resources to achieve the implementation of the strategy and d) promote the exchange of knowledge through day-to-day procedures to tackle mobility and staff replacement. The Prefecture should also invest in ICT infrastructure and tools, as well as in specific training programs to promote the creation, acquisition, storage and transfer of knowledge within the organization. Finally, the Prefecture should continuously monitor and evaluate the compliance of all members with the strategy.

6.1 Limitations

As a limitation of the study is that research is restricted to only one of the 13 Prefectures of Greece, so it would be interesting to see the results in various Prefectures and even in other public organizations. The total number of the sample is also an issue. The 153 responses represent only 14.5% of the total survey population (Prefecture employees). The authors suggest that future research could be carried out with a larger sample size and involving more public entities in Greece.

This will give us the opportunity to examine the differences in organizational culture and structure. It is also proposed that similar private sector surveys should be conducted in order to derive comparative results from both sectors. In addition, in a future study, more organizational factors than those tested should be added, i.e. leadership, policy guidance, etc. Moreover, it is worth mentioning that since the survey was conducted through an electronic questionnaire, employees, such as elders or manual workers, do not have an email account. Therefore, their participation in the study was not possible. It should also be mentioned that absence of previous study on KM in the public sector in Greece is also a limitation of the study.

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