Web 2.0 as a key tool for sharing knowledge in Basque Country SMEs***La Web 2.0 como herramienta clave para compartir conocimiento en las Pymes del País Vasco***

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Abstract: Information and Communications Technologies (ICTs), generally, have been known as the tools that allow firms to capture, process, store and transfer information. But also, ICTs are acknowledged as a valuable tool in the knowledge management process. Many research works related to SME have defined ICTs as one of the critical factors when implementing knowledge management. The process for managing knowledge can be grouped into three stages: knowledge acquisition, storing and sharing. The knowledge process starts when a necessity triggers the interest to acquire new knowledge. In this process, knowledge sharing has become an important variable in enterprises; however, the workplace cannot be considered the best context to make employees' knowledge flow. Nevertheless, in practice, knowledge sharing proves to be a significant barrier for effective development of this mentioned process. And due to the existence of this barrier, it has become very important to analyse the influence of the ICTs in the last decade and their evolution towards filling up that gap. The bibliographic review in this paper illustrates that some of the existing ICTs, such as Web 2.0, are perfect matches to knowledge management. Web 2.0 focuses on people and can help us find a solution in order to improve the knowledge sharing. Furthermore, these tools are inexpensive to acquire and operate, so they adapt better to the requirements of small enterprises in what refers to their resource scarcity. Small and medium-sized enterprises (SMEs) are an essential part of economy, and due to this, they are important in employment creation. Besides, the characteristics of SMEs are different from large business, and that is why the ICT theories developed for larger enterprises may not be suitable for SMEs. In addition, it can be confirmed that not many research works focused on SMEs have been conducted in the field of knowledge management. Therefore, with the aim of confirming a significant presence of ICTs in the Basque enterprises, this research study analyzes what is the current availability of technological tools for Basque Country SMEs. More specifically, we research the use of Web 2.0, in order to evaluate whether the Basque SMEs give importance to knowledge sharing process and what activity sector and size of SME, grouping the results by number of employees.

Keywords: Knowledge management, knowledge sharing, ICT, Web 2.0, SME.

Resumen: Un análisis bibliográfico basado en la evolución de las TICs nos ha permitido descubrir el desarrollo de herramientas, como la Web 2.0, cuyos principios son similares a los de la gestión del conocimiento y son consideradas como facilitadoras para la compartición del conocimiento entre las personas. Por ello, este artículo tiene como objetivo conocer cuál es la actual situación del uso de las TICs para la gestión del conocimiento en las pymes del País Vasco. Además, con el fin de conocer el grado de importancia que otorgan estas pymes a la compartición de conocimiento, se analiza el uso de las herramientas Web 2.0 según el sector de actividad y el número de empleados de la pyme vasca.

Palabras clave: gestión del conocimiento, compartición del conocimiento, TIC, Web 2.0, PYME.

I. Introduction

Small and medium-sized enterprises (SMEs) are a vital part of any regional economy. In the Basque Country, SMEs are the main source of wealth and employment of its industry, specifically, 99.82% of companies are SMEs. According to EUSTAT (Statistics Institute of Basque Country) data, almost 90% of Basque Country companies have less than five employees. However, the small size of the company is not specific from Basque Country, but also is general in European busi-

ness model (Gobierno Vasco, 2010). European Commission has analyzed EU SME in 2012, and has concluded that, throughout the downturn, SMEs have retained their position as the backbone of the European economy, with some 20.7 million firms accounting for more than 98 per cent of all enterprises, of which the lion's share (92.2 per cent) are firms with fewer than ten employees. For 2012 it estimated that SMEs accounted for 67 per cent of total employment and 58 per cent of gross value added¹ (European Commission, 2012). With this information, management

¹ Gross Value Added (GVA) includes depreciation, rewards to labour, capital and entrepreneurial risk. GVA remains when the intermediate costs are deducted from the sales or turnover.

scholars cannot ignore SMEs as a viable and interesting research space (Desouza and Awazu, 2006).

Over the past few decades, many parts of the global economy have moved towards a knowledge base, in which wealth creation is associated with the challenge of developing and managing knowledge resource (Coyte et al., 2012). A literature review saw that knowledge management has been studied extensively. Even so, there is a tendency to focus on large business and neglect SMEs (Durst and Edvardsson, 2012). Prior relevant research suggests SMEs are different, not just in size, but in practices around a wide range of management activities, including in the management of knowledge (Hutchinson and Quintas, 2008). Thereby, further research is needed to better understand how SMEs manage knowledge resources (Salojärvi et al., 2005, Ricceri et al., 2010).

In this context, the advancement and ever-growing of Information and Communication Technologies (ICTs) developed within the past few decades has favoured changes in SME management (Barba et al., 2007) (Cela, 2005). Nowadays, the use of ICTs by European SMEs is driving the way that enterprises run their business and organise e-commerce. The statistical study made by EUROSTAT concludes that, in 2012, 97% of European SMEs had access to Internet, 77% had a website and one in two enterprises provides staff with portable devices for mobile Internet connection (EUROSTAT, 2012). ICTs play a vital role in the global socio-technological realm through knowledge mobilization, network externalities, alliances and cooperative relationships. The convergence of knowledge management processes and ICTs infrastructure and architecture have been enhanced by the recent advancements in technology ubiquity, semantics and knowledge representation (Mohamed et al., 2010).

Particularly, ICTs have a valuable potential for developing SMEs through better integration in business process; also, assisting them to make more efficient decisions to their performance. ICTs have potential to generate changes among SMEs and make them more competitive and innovative (Barba et al., 2007).

In this paper, the use of Information and Communication Technologies (ICTs), as a tool for supporting knowledge management process, will be analyzed, with the purpose of describing the current situation of the use of them, and analyzing the use of Web 2.0 for sharing knowledge in Basque Country SMEs.

2. Knowledge sharing and Web 2.0

ICTs can enhance knowledge sharing by lowering temporal and spatial barriers between workers. Knowledge sharing has been identified as a phase in the process of knowledge management. At the same time that knowledge sharing is recognized as an important pillar in knowledge management, in practice, it proves to be a significant barrier for effective knowledge management (Hendriks, 1999). Various factors have been identified as impediments for knowledge sharing, like inadequate organizational structures and sharing unfriendly organizational cultures, among others (Davenport and Prusak, 2000) (Tissen et al., 1998). The enterprises need to adapt to new scenarios, searching for new organizational structures and approaches. Thus, the management model change into an organization context which promotes the exchange of knowledge by creating the appropriate environment, abandoning the traditional hierarchical structures and giving flexibility to the organizations (Alvarez et al., 2014).

The adoption and implementation of ICTs can improve business cooperation, business relationships, quality and diffusion of knowledge. Thus, ICTs are powerful strategic tools for SMEs (Barba et al., 2007). Despite the fact that, other research studies conclude that there is a strong need to create, share and disseminate knowledge within SMEs, this is clearly not related with the availability of ICT infrastructures (Nunes et al., 2006). In particular, when information systems such as intranets, document management systems or groupware applications are introduced to support knowledge sharing, reports show that often the introduction of these systems does not result in significant improvements in knowledge sharing (Hendriks, 1999). Hendriks concludes that ICT is an important instrument to share knowledge, but not the only or most prominent one (Hendriks, 1999). Then, how knowledge can be shared using ICTs?

Internet maturity and development over the last decade, the large number of people that have access to internet through desktop and mobile devices and the evolution of software sector have resulted in what has been called phenomenon Web 2.0 (Levy, 2009). Forcing people to encode their knowledge in a formal manner is not easy. When people are socializing, even in a work context, they are much happier to share their thoughts and their experiences. According to Albors et al. (2008) business models are benefiting from the evolution of new alternatives of networking collaboration. Therefore, he puts the

change needed for knowledge management on focusing on people, allowing systems to be focused more into human. Web 2.0 focuses on people; hence, Web 2.0 is bringing a new trend that should be adopted in knowledge management (Levy, 2009). But, why? Sharing it's not easy. Perhaps, sharing is something that happens after work time or outside the workplace. The access to the Internet through mobile devices and the ICTs development towards tools like Web 2.0 have given a potential solution to one of the knowledge management challenges. In a knowledge management system human aspects must be considered (Adams & Freeman, 2000), and in this way, the evolution of ICTs towards Web 2.0 tools facilitates the creation of communities that can be considered as a networks of personal connections and they allow knowledge sharing process.

Levy (2009) has analyzed Web 2.0 principles in a knowledge management perspective and has concluded that they are very close to those in knowledge management. Web 2.0 principles are part of the traditional knowledge management core concepts: technology as a platform, web services, active participation of users, and content as a core, among others.

Regarding to Web 2.0 tools, they can be used in organization as is. Furthermore, many of them can be adopted free or purchased at low prices (Levy, 2009). Thus, Web 2.0 tools convert into an interesting tool for SMEs, adapting to their characteristics and facilitating the knowledge management process. Besides, Levy (2009) makes a comparison based on functional aspects between Web 2.0 and knowledge management tools and concludes that the Web 2.0 tools attributes have roots in knowledge management tools. For example, social computing as a component of Web 2.0 could be compared with communities of practices as relevant attribute in knowledge management.

Therefore, if we look for tools based on technological platforms that facilitate knowledge sharing process, the Web 2.0 meets the requirements. Besides, if we consider the needs of enterprises, most of the social *de facto* standards, like Wikipedia, have developed into business requirements and companies have adopted them (Albors et al., 2008). Thus, our three items are linked: knowledge sharing, Web 2.0 and enterprise.

3. Empirical Study: the availability of technological tools to support knowledge management in Basque SMEs. Results

First, the methodology that will be used to analyze the availability of technological tools to support knowledge management in Basque SMEs (Table I) is introduced.

The studied targeted a group that is composed of 526 SMEs with headquarters in the Basque Country that are associated with any of the following industrial clusters: Machine- Tools, Electrical Appliances, Automotive, Environment, Electronics, Computing and Telecommunications, Energy, Aeronautics and Space, Paper, Audiovisual, Transport and Logistics. These activity sectors have been selected for this study because they have in a high index of industrial production and have diversity in terms of their level technology. Moreover, clusters are a key element in competitiveness in the Basque Country and have become the backbone of Basque economic structure. Besides, they have allowed encouraging the flow of knowledge, innovation and learning, thanks to the geographical concentration of its enterprises' activities. Consequently, the company associated with these clusters takes place in an environment where the flow of knowledge is

Table I
Data sheet for research

Object of Study	526 SME associated with clusters.
Associated Clusters	Machine- Tools, Electrical Appliances, Automotive, Environment, Electronics, Computing and Telecommunications, Energy, Aeronautics and Space, Paper, Audiovisual, Transport and Logistics.
Scope	Basque Country.
Data of implementation	June - July 2011
Source for elaboration of questionnaire	1. "Measuring Knowledge Management in the Business Sector: First Steps" (OCDE, 2003). 2. "Estudio sobre la Gestión del Conocimiento en España 2004" (Tena and Ongallo, 2004). FUNDECYT y AENOR

abundant and gives more importance to knowledge management.

To collect data, the survey was designed with questions about the availability of technological tools to support knowledge management in order to make an inventory of them. In the questionnaire, there are tools related to internet access, website available, Intranet system, Extranet system, no computerized knowledge supports (documentation centres, archives,...), Workflow/groupware systems, document management systems, computer tools for information search, make use of knowledge sharing applications, like WEB 2.0 and PLM software.

The analysis of the results, both quantitative and qualitative, about the availability of different tools to support knowledge management practices, can contribute to understand better the current situation of ICTs in regard to knowledge management practices in different types of companies classified by activity sector and number of employees.

3.1. The availability of technological tools to support knowledge management in the Basque SMEs

In Table 2 are represented the results related to the availability of technological tools to support knowledge management in the Basque Country SMEs proposed in this study.

In Figure 1 and Figure 2 are represented the results related to the availability of technological tools to support knowledge management in the Basque SMEs by activity sector and number of employees.

3.2. The availability of WEB 2.0 to support knowledge sharing in the Basque SMEs, by activity sector and number of employees

In Figure 3 and Figure 4 are represented the results related to the availability of Web 2.0 to support knowledge sharing in the Basque Country SMEs.

Table 2
Percentage of Basque SME that has available technological tools

Technological Tools	Available
Access to Internet	100%
Website	95%
Intranet system	73%
Extranet system	50%
No computerized knowledge supports (documentation centers, archives...)	41%
Workflow/Groupware systems	45%
Document management systems	55%
Computer tools for information search	55%
Make use of knowledge sharing applications, like Web 2.0	59%
PLM software	0%

Figure 1

The availability of technological tools to support knowledge management in the Basque SMEs by activity sector

Figure 2

The availability of technological tools to support knowledge management in the Basque SMEs by number of employees

Figure 3

The availability of Web 2.0 to support knowledge sharing in the Basque SMEs by activity sector

Figure 4

The availability of Web 2.0 to support knowledge sharing in the Basque SMEs by number of employees

4. Conclusions

This study offers a differentiated contribution to the knowledge management research, clarifying the role played by ITs in the Basque SMEs used in the knowledge management context and giving more importance to the technological tools that facilitate sharing of knowledge, like Web 2.0 tools.

In the Basque SMEs, the more representative technological tools are: access to the internet, website, intranet system and Web 2.0 tools. Looking for European statistics about the access to the Internet in

SME (97%), it can be concluded that the percentage of Basque SMEs that have access to Internet is higher than the European ones. Furthermore, in general terms, the Basque SMEs have a large availability of technological tools in order to support knowledge management practices. Therefore, we can conclude that Basque SMEs have understood the importance of using IT tools for knowledge management.

The Electronics, Computing and Telecommunications sector is the one that has more availability of tools. Therefore, it can be concluded that the availability of technological tools to support knowledge management is linked with technological development of the sector. Moreover, the analysis of availability of tools according to SME size (by number of employees) allows us to confirm the result of other research study related to the use of ICTs in enterprises, claiming that the capacity to have technological tools to support knowledge management is directly proportional to the capacity of technical and human infrastructure of SMEs.

Regarding to the use of knowledge sharing applications like Web 2.0, it can be concluded that the Basque SMEs have promoted the use of new ICT technologies to seek the improvement of knowledge

sharing, in order to provide a solution to this important gap in knowledge management process. It is highlighted the fact that Aeronautic and Space sector makes the most use of it. Also, it is observed the fact that SMEs with fewer employees (between 1 and 9) are those that make the most use of it. So, it can be concluded that knowledge sharing doesn't depend on technical and human infrastructure, but thanks to new ICTs development the solely requirement needed to achieve knowledge sharing is that employees are motivated to do so.

Hence, the results of the study allow concluding that there is an increasing awareness in the firms about the human aspects (Adams & Freeman, 2000) and knowledge management systems, promoting the use of collaborative or social networking that encourages the relationships between persons, and therefore, the sharing of knowledge. The objective of Web 2.0 is to facilitate collaboration and sharing, among others (Albors et al., 2008). Thus, the evolution of ITs to more social, less complicated and less expensive tools has enabled knowledge sharing to be implemented at the smallest enterprises.

Finally, we think that this work has important implications for enterprises as it identifies the level of use of ITs as a KM enabler; and also for academics as it identifies the needs for research in collaboration networking to improve knowledge management process.

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