



Knowledge management issues in the EFQM Excellence Model framework

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Abstract:	

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Abstract

Purpose: This paper aims to identify knowledge as a key strategic resource within the EFQM Excellence Model. Our study also analyses whether the EFQM Model helps to create an adequate context for successful knowledge management. A description is given of the synergies between both management approaches, with the purpose of reaching sustainable competitive advantages within organizations.

Design/methodology/approach: A literature review and a content analysis are carried out which show how the current version of the EFQM model includes the key aspects of the knowledge management systems and its process. Also, the relationships and synergies between both considered management approaches are analysed: quality management and knowledge management.

Findings: After a detailed analysis of knowledge management issues in the EFQM model, important synergies and complementary elements are appreciated between both management frameworks. Evidence is given of how the integration of both frameworks constitutes a dynamic capability that can lead organizations to attain sustainable competitive advantages.

Practical implications: An exhaustive review is given of the elements related to knowledge management present in the EFQM model. In addition, companies are offered guidelines to be able to manage their knowledge through a model that is recognized and widespread in the business sphere.

Originality/value: The research develops the first content analysis of the process elements and knowledge management systems present in the whole structure of the EFQM model. Furthermore, it is shown how the integration of excellence and knowledge management constitutes a dynamic capability for organizations based on continuous improvement, innovation and learning.

Keywords: EFQM model, excellence management, knowledge management, dynamic capabilities

Paper type: Conceptual paper

1. Introduction

Nowadays organizations recognize that knowledge and its effective management represent a fundamental source of sustainable competitive advantage (Schiuma, 2009). As well as knowledge being considered as the most important strategic resource, knowledge management (KM) is considered to be critical to an organization's success (Van den Hooff and Huysman, 2009). According to McElroy (2000), a second generation KM implies understanding how knowledge is created and how it is shared throughout the organization, instead of considering knowledge only as a means to support business operations.

In this context, organizations need to use models and systems to manage knowledge with the aim of increasing their competitive capacity. Knowledge management systems (KMS) are a set of infrastructures, practices and instruments that support knowledge management activities (Alavi and Leidner, 2001). In practice, the implementation of KMS is not free of difficulties, since it requires profound cultural, strategic, organizational and technological changes in the organization (Singh and Kant, 2008). In this regard, the use of consolidated and extended management models and systems, in the professional and academic fields, can help organizations overcome these barriers (Baskerville and Dulipovici, 2006; Davies, 2008).

The literature has shown that KM can coexist with quality management (QM), since they share key factors of success such as: approach to clients and others stakeholders, involvement of human resources, leadership, management based on data and information systems, and process management (Molina *et al.*, 2004; Hsu and Shen, 2005; Ju *et al.*, 2006; Colurcio, 2009; Hung *et al.*, 2010; Stewart and Waddell, 2008; Asif *et al.*, 2013; Marchiori and Mendes, 2018). In addition, there is evidence that the association of KM and QM has the potential to generate competitive advantages and the long-term survival of organizations (Chourides *et al.*, 2003; Marcus and Naveh, 2005; Hung *et al.*, 2010), as well as positive effects in the performance and results (Linderman *et al.*, 2004; Molina *et al.*, 2004; Hsu and Shen, 2005; Loke *et al.*, 2012; Calvo-Mora *et al.*, 2015; Qasrawi *et al.*, 2017; Yusr *et al.*, 2017). Nevertheless, there is no consensus on the nature of this relationship. Thus, some works point to a reciprocal and synergistic relationship between KM and QM (Linderman *et al.*, 2004; Martinez-Costa and Jimenez-Jimenez, 2008; Calvo-Mora *et al.*, 2015; Wilson and Campbell, 2018). Others consider KM as a factor that facilitates

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3 the implementation of QM (Stewart and Waddell, 2008; Kaziliunas, 2011; McFadden *et al.*, 2014), and
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5 others suggest that the practice of QM serves as a support to the development of an effective KM
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7 (Chourides *et al.*, 2003; Molina *et al.*, 2004; Molina *et al.*, 2007; Colurcio, 2009; Loke *et al.*, 2012; Asif
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9 *et al.*, 2013; Ooi, 2014; Honarpour *et al.*, 2017; Wilson and Campbell, 2018).

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11 In this context, Martinez-Costa and Jimenez-Jimenez (2008) and Marchiori and Mendes (2018) affirm
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13 that systematic efforts are necessary to develop a solid theoretical framework that explains the
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15 relationship between QM and KM. In addition, the literature still lacks evidence on reference models
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17 and key factors that could contribute to an effective and efficient integration of QM and KM. Indeed,
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19 this work attempts to cover this gap. Firstly, the literature on KM, QM and excellence are analysed in a
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21 systematic and structured manner. Secondly, an analysis of the content of the European Foundation for
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23 Quality Management Excellence Model (EFQM-EM) is carried out, attempting to identify the elements
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25 that connect with the KMS and the phases of the KM process. Thirdly, it is considered how the
26
27 integration and systematic application of KM and QM favour the appearance of dynamic capabilities,
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29 which allow organizations to reach sustainable competitive advantages over time.
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33 Unlike other studies, our study analyses the latest and most current edition of the cited 2013 model,
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35 attempting to delve into the aspects related to knowledge and its management, in all its structural
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37 elements (principles, criteria and sub-criteria, transverse axes and RADAR logic). In this regard,
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39 knowing and understanding how to use the EFQM-EM for KM is not only useful for the more than 500
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41 EFQM Member Organizations, but also for the thousands of organizations and companies that use the
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43 aforementioned model to evaluate themselves, to better know their strengths and areas to improve, and
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45 to move towards sustainable and excellent management.
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48 More specifically, this study attempts to answer the following research questions (RQ):

- 49 • RQ1: Does the EFQM-EM consider knowledge as a key strategic resource?
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- 51 • RQ2: Can the EFQM-EM help create an adequate context for the success of knowledge
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53 management processes and systems in an organization?
- 54
- 55 • RQ3: Does the integration of management excellence, through the EFQM-EM, and knowledge
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57 management favour the emergence of dynamic capabilities in the organization?
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To this aim, the study begins by describing the EFQM-EM and the elements that integrate it, as well as presenting the bases of what knowledge and its management mean. Subsequently, an analysis is made of the KM aspects present in the EFQM-EM elements. Next, the main results obtained from the study are discussed. Finally, the conclusions, limitations and future lines of research are presented.

2. Literature review

2.1. The EFQM Excellence Model

The excellence models in general, and the EFQM-EM in particular, present non-prescriptive frameworks that allow organizations to: (1) have a basic structure to design, implement and improve a comprehensive management system; (2) evaluate where they are on the road to excellence, identifying their strengths and shortcomings as a starting point for the establishment of strengthening and improvement plans; (3) have a framework and common language that favours effective communication within the structure; and, (4) integrate strategic planning and orientation toward stakeholders, in a systematic manner, in the management of the organizations (Bou-Llusar *et al.*, 2009; Kim *et al.*, 2010; Calvo-Mora *et al.*, 2014).

To achieve sustained success in management, the EFQM-EM proposes the integration of four components (Figure 1) (Gómez *et al.*, 2011; Tickle *et al.*, 2016): fundamental concepts of excellence, evaluation criteria, transverse axes and the RADAR logic.

Insert Figure 1 about here

The eight *fundamental concepts of excellence* lay the foundations to achieve sustainable excellence in any organization. They can be used as a basis to describe the attributes of an excellent organizational culture. The fundamental concepts of excellence are (EFQM, 2012): Leading with vision, inspiration and integrity; Succeeding through the talent of people; Harnessing creativity and innovation; Developing organizational capability; Managing with agility; Adding value for customers; Creating a sustainable future; and, Sustaining outstanding results.

The aforementioned principles are translated and specified in nine *dimensions or criteria (vertical vision of the model)*, that serve as a guide for the implementation of the management system, and the measurement of the results that are being achieved by the organization. The nine criteria that the model

proposes represent the elements indicative of the degree of progression which a certain organization follows to achieve excellence. These criteria are classified into five *Enablers* (Leadership, Strategy, People, Partnerships and Resources, and Processes, Products and Services), and the four remaining dimensions reflect the *Results* that the organization achieves (Customer Results, People Results, Society Results, and Business Results). To develop each criterion in more detail, they contain a variable number of sub-criteria. In total, the EFQM model includes 32 sub-criteria that must be addressed when carrying out a full self-assessment of the organization. Finally, each sub-criterion includes a list of elements that is neither exhaustive nor mandatory to be considered (174), the objective of which is to provide examples that clarify the meaning of the sub-criteria and guide the self-assessment of the organization. In addition, the EFQM-EM has a dynamic nature, indicating which activities, such as innovation, learning or creativity, drive and strengthen the impact that the model's enablers have on the results. This refers to the continuous improvement of the quality system in the pursuit of excellence (EFQM, 2012). However, the EFQM-EM is not a set of unconnected criteria. On the contrary, it presents a series of related practices that offer greater continuity and coherence. The interpretation of the relationships between the criteria and sub-criteria is specified in the so-called *transverse axes* or *horizontal vision of the model*. The existence of these axes implies that, in adopting a systemic approach to management, when implementing projects to improve any of the processes or practices of the organization, effects will be achieved on more than one criterion. As such, global improvements in the organization cannot be achieved if the different aspects of the criteria of the model are not simultaneously addressed as interdependent elements (Calvo-Mora *et al.*, 2015).

RADAR logic (*Results, Approaches, Deploy, Assess and Refine*) provides a structured approach to perform the self-assessment, based on the EFQM-EM. The elements Approaches, Deploy, Assess and Refine are applied to the agents' criteria, and provide evidence of what the organization is doing. The Results element is used to evaluate the results criteria, and analyses what the organization achieves, as a result of the efforts made.

2.2. Knowledge management: processes and systems

Assuming that knowledge is a critical input to production processes, KM refers to an organization's capability to use and combine various sources of knowledge that could transform tangible resources into

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3 value, in the form of product or process innovations (Kießling *et al.*, 2009). Li *et al.* (2009) and Tsai
4 and Li (2007) define KM as the capability to create and use knowledge to build a sustainable competitive
5 advantage, given that knowledge is a valuable, rare, inimitable, and non-substitutable (VRIN) resource.
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7 We refer to KM as the integration of people, technologies, processes and strategies, within the
8 organization, to create, share, and use knowledge (Martelo-Landroguez *et al.*, 2011).
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13 **Knowledge management processes**

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15 After a review of the existing literature, we state that there are discrepancies in terms of the number and
16 labelling of knowledge management processes (Chen and Huang, 2009; Huang and Li, 2009; Denford
17 and Chan, 2011; Sandhawalia and Dalcher, 2011; Schiuma *et al.*, 2012) but, at least, the following four
18 key KM processes must be considered: 1) knowledge creation; 2) knowledge storage; 3) knowledge
19 transfer, and, 4) knowledge application.
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26 Knowledge creation (KC) refers to the accumulation of knowledge in organizations (Gold *et al.*, 2001;
27 Lin and Lee, 2005). However, for knowledge to be used to help companies in their work, all individuals
28 in an organization must have access to the knowledge base. It is knowledge storage (KS) that gives
29 organizations quick and easy access to knowledge, in order to make knowledge accessible to those who
30 need it (Davenport and Prusak, 1998).
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37 In order to make this knowledge available to others within the organization, individuals and departments
38 must be involved in the process of knowledge transfer (KT) (De Vries *et al.*, 2006). This process
39 involves the active communication to others of what we know, and the active questioning of the others,
40 to learn what they know (Van den Hoof and De Ridder, 2004; Krylova *et al.*, 2016). Therefore, we refer
41 to knowledge transfer as the exchange of knowledge between the source and its recipient (Gold *et al.*,
42 2001; Radaelli *et al.*, 2011). Knowledge transfer among employees is seen as an effective way of
43 acquiring local knowledge (Gold *et al.*, 2001), and improving the knowledge that an organization has
44 about its competitors, and the industry as a whole.
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53 Finally, the application of the knowledge generated in the knowledge creation phase, and retained in the
54 phases of knowledge transfer and knowledge storage, must occur. We refer to knowledge application
55 (KA) as the actual use of knowledge within the organization (Ipe, 2003). It involves using knowledge
56 in support of decisions, actions, and problem solving. An example of this is when information about the
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3 implementation of the quality management system is assimilated by decision makers in an organization,
4 and it changes its organizational daily routines.
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7 **Knowledge management systems**

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9 Organizations could be considered knowledge stores. Hence, it is important to access their knowledge
10 and to create an enabling environment for knowledge acquisition, sharing and use within the company
11 (Davenport *et al.*, 1998). This could be handled by adopting a knowledge management system (KMS).
12
13 Organizations should take advantage of their knowledge base and consider the opportunity for
14 expanding it (Del Giudice and Della Peruta, 2016). Therefore, we state that KM processes are not only
15 important parts for an effective implementation of knowledge management systems, but they are also
16 supported by these systems, in terms of communication tools and other instruments that allow the
17 management of knowledge (Alavi and Leidner, 2001; Del Giudice and Della Peruta, 2016).
18 Consequently, organizations need to develop KMS in order to manage their knowledge and make it
19 available to employees, as required (Damodaran and Olphert, 2000).
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22 As knowledge becomes an increasingly valuable and important organizational asset, many organizations
23 anticipate that implementing the KMS will effectively support and enhance organizational KM
24 activities. Some even regard KMS as an emerging and powerful source of competitive advantages
25 (Wang and Wang, 2016). In addition, the increasing amount of knowledge generated, stored and
26 leveraged within organizations, demands efficient management of knowledge.
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29 According to Wang and Wang (2016), the main purpose of KMS is to leverage organizational KM
30 behaviour. In other words, a KMS must be a socio-technical system whose objective is the management
31 of knowledge, to support the achievement of organizational goals (Damodaran and Olphert, 2000). In
32 the same way, organizations that are introducing the EFQM Excellence Model need to incorporate a
33 KMS. Without proper information management systems, procedures and tools, large amounts of
34 information may become a serious issue that could result in less reactive responses, inefficiency, and a
35 decline in the organization's capacity to implement the quality policy (Mohsen *et al.*, 2011).
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38 Training people to share their own individual knowledge and expertise is of paramount importance,
39 especially when a company culture has not fully embraced the principles of KM (Ali and Ahmad, 2006).
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41 Organizations should understand the importance of KM and every employee should be encouraged to
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3 create, share, and use knowledge in their daily routines (Davenport and Prusak, 1998; Ong and Tan,
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5 2018), as organizational culture may facilitate or hinder the KMS implementation (Wang and Wang,
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7 2016).
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9 **2.3. Relationship between knowledge, quality and excellence management**

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11 Nowadays, few researchers doubt that QM and KM are compatible and complementary management
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13 approaches. However, their relationship has been approached from different perspectives and, in many
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15 cases, partial aspects have been studied which hinder the understanding of the complexity of this
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17 relationship. After a review of the literature and a bibliometric analysis, Marchiori and Mendes (2018)
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19 identified, on the one hand, studies that put the emphasis on how the principles and practices of QM can
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21 serve as a starting point to implement KM initiatives, effectively and efficiently. Other works accentuate
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23 the fact that KM is a critical element for the success of the QM initiatives and for obtaining better results.
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25 Another group of increasingly numerous studies, concentrates on analysing the best way to integrate
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27 both management approaches, so that synergies are obtained which favour the achievement of
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29 sustainable competitive advantages for organizations.
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33 On the other hand, it is common for researchers to approach the relationship between QM and KM
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35 through the most widespread QM approaches (ISO 9000 standards and excellence models), either
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37 through the elements of the KMS, or the phases of the KM process.
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40 Thus, for Lin and Wu (2005) and Marcus and Naveh (2005) the ISO 9001 standard is an information
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42 exchange tool that can be used to obtain the knowledge necessary to improve the quality and the
43
44 performance in organizations. Also, it provides an appropriate framework within which to order,
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46 structure, create and transfer knowledge. Along this line, Tang and Tong (2007) indicate how the
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48 auditing processes within the ISO 9000 standards framework, through the detection of nonconformities,
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50 aids the application of remedial actions and the design of preventive actions, which favour the
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52 development of the KM process. More recently, Wilson and Campbell (2016, 2018) identify
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54 relationships of the foundations of KM with the principles of QM of the 2015 ISO 9000 standards and
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56 the management requirements of the 2015 ISO 9001 standards. In addition, these authors consider that
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58 the QM systems can provide a coherent structure to help organizations to apply knowledge requirements
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60 in practice.

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3 With respect to the excellence models, Benavides and Quintana (2005) propose a systematization of the
4 KM phases and systems, based on the internalization of the values of total quality culture, and the
5 application of the EFQM-EM. Martín-Castilla and Rodríguez-Ruiz (2008) make a conceptual analysis
6 of the relationships between the EFQM-EM criteria and the components of the intellectual capital
7 (human, structural and relational), reaching the conclusion that EFQM-EM is a suitable framework for
8 organizational KM. Allameh *et al.* (2014) provide evidence of how organizations who use the EFQM-
9 EM obtain valuable data on the measurement of knowledge exchange and performance improvement.
10 On the other hand, Calvo-Mora *et al.* (2015) analyse the potential of the EFQM-EM to design and to
11 implement KM which improves the key results of the organization. For this they use a horizontal vision
12 of the EFQM-EM based on transverse axes. The results show how the EFQM-EM can be a valid
13 framework to implement KM. In addition, the use of process methodology and the involvement of
14 suppliers and partners are key factors for the KM to have a significant impact on the key results. Ooi
15 (2009) suggests a theoretical framework that relates the criteria of the Malcolm Baldrige model
16 (leadership, strategic planning, information and analysis, process management, human resource
17 management and customer focus) to the phases of the KM process (acquisition, dissemination and
18 application). Later, Ooi (2014, 2015) empirically validated this model and corroborated its effectiveness
19 in manufacturing and service companies. On the other hand, Akdere (2009) explores the relationship
20 between KM and QM, within the framework of the Malcolm Baldrige model, and analyses its influence
21 in the development of human resources to improve the performance of the organization.
22
23 Regarding KMS, Hsu and Shen (2005) and Stewart and Waddell (2008) find similarities between KMS
24 and QM systems, through elements such as human resources management, leadership and
25 empowerment. For Chourides *et al.* (2003) the QM programmes have provided a solid base for the
26 implementation of KM, as there is complementarity in elements, such as, the cultural principles and
27 values, the emphasis on teamwork, continuous improvement, process management and information and
28 communications technology.
29
30 Finally, we found studies that analyse the relationship of the KM process phases with quality. Thus,
31 Linderman *et al.* (2004) propose an integrated vision of quality and knowledge using Nonaka's theory
32 of knowledge creation. This perspective helps to clarify how quality practices can lead to the creation
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3 and retention of knowledge and how KM provides information on the effective implementation of QM.
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5 Asif *et al.* (2013), Yusr *et al.* (2017) and Qasrawi *et al.* (2017) indicate that the improvement of business
6
7 performance requires the acquisition and integration of new knowledge, throughout the organization. In
8
9 addition, a series of QM practices, such as continuous improvement, process management and
10
11 teamwork, are identified that can contribute to strengthening the phases of the knowledge creation
12
13 process. Colurcio (2009) affirms that QM has been demonstrated to be an effective catalyst of the
14
15 generation and the diffusion of knowledge, as it provides policies and tools that are intrinsically useful,
16
17 such as teamwork, communication and process management. Molina *et al.* (2007) confirm the
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19 importance of the different QM practices (suppliers and customer co-operation, teamwork, autonomy
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21 and process control) in the internal and external transfer of knowledge. For Kaziliunas (2011),
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23 McFadden *et al.* (2014) and Martinez-Costa and Jimenez-Jimenez (2008), learning and the KM process
24
25 allows important information to be compiled, created, stored and utilised, which increases the
26
27 effectiveness of QM and the organizational performance.
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30 31 **3. Methodology**

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33 The methodology followed in this study has its origin in the posed research questions, and has followed
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35 the guidelines developed by studies with similar objectives, such as those of Martín-Castilla and
36
37 Rodriguez-Ruiz (2008), Ooi (2009) and Wilson and Campbell (2018). As stated previously, the
38
39 proposed research questions are:

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41 RQ1: Does the EFQM-EM consider knowledge as a key strategic resource?

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43 RQ2: Can the EFQM-EM help create an adequate context for the success of knowledge management
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45 processes and systems in an organization?

46
47 RQ3: Does the integration of management excellence and knowledge management, through the EFQM-
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49 EM, favour the emergence of dynamic capabilities in the organization?

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51 This led to the identification, analysis and review of existing scientific literature on KM, QM, EFQM-
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53 EM and their relationships, for which the Web of Science and Scopus databases were used. In addition,
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55 the latest version of the 2013 EFQM-EM, acquired from the European Foundation for Quality
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57 Management (EFQM), was used as the main source for content analysis. The content analysis is based
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59 on reading (textual or visual) as an information collection instrument. This reading, unlike common
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reading, must be made following a scientific method, that is, it must be systematic, objective, replicable and valid (Krippendorff and Bock, 2008). In short, the content analysis allows us to make a theoretical analysis of KM from the management philosophy included in the structure of the 2013 EFQM-EM.

4. Results

The EFQM-EM is impregnated with guidelines, referring to KM being considered as a strategic axis that drives organizations on the road to excellence (Colurcio, 2009; Calvo-Mora *et al.*, 2015). The dynamic structure of the EFQM-EM clarifies the role of KM in the search for excellence, thus, the continuous improvement of the cause / effect relationship between enabler and results criteria. It is meaningless if you do not innovate, learn and develop creativity. This is precisely where the essence of excellence proposed by the EFQM-EM lies, an improvement process characterized by a management approach that enhances innovation, learning and creativity.

4.1. Knowledge management in the fundamental concepts of excellence

A review of the meaning and implications of each of the fundamental concepts of excellence leads us to conclude that KM is present in six of the eight statements (see Table 1).

Insert Table 1 about here

4.2. Knowledge management in the vertical vision of the EFQM Model

Even though KM is in all the EFQM-EM criteria, the *People* criterion gives KM the most weight, as noted in Davenport and Prusak (1998), or Wong (2005), KM is the management of people. In this sense, excellent organizations value people by creating a culture that allows personal and organizational objectives to be achieved, permitting benefits to both parties. In addition, they develop the capacities of people, promoting equity and equality, as well as enhancing internal communication and rewarding and recognizing effort. This serves as a motor for the motivation of people, increases commitment to the organization and encourages them to use their skills and knowledge for its benefit.

The aspects of KM that, after the content analysis, can be identified in the sub-criteria of the EFQM-EM, are summarised in the following table.

Insert Table 2 about here

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3 The EFQM-EM includes a comprehensive set of performance indicators (results criteria) that represent
4 the extent to which the organization has reached the implementation and development of the excellence
5 enablers (Calvo-Mora *et al.*, 2014). An in-depth study will not be specifically made for each results
6 criterion (and sub-criteria), as it is readily understood that they include a completely broad amalgam of
7 data, direct and indirect indicators, information, etc., referring to the achieved results. These not only
8 show where the organization is placed, but also provide the background, trends and, ultimately, the
9 expected sustainability of its overall performance, grouped in the four above-mentioned categories.

10
11 In essence, they represent a body of procedures and criteria for measurement, data, indicators and
12 primary and secondary information, obtained in order to make future management decisions aimed at
13 continuous improvement and, ultimately, to advance along the path of excellence (Davies, 2008). In this
14 regard, the four results criteria are the basic elements of the knowledge accumulated within the
15 organization. These not only serve to mark the stage, speed and direction that the continuous quality
16 improvement has reached in the organization but also, and even more importantly, they guide us into
17 the future or pursued destiny in permanent adaptation to the environment (Martín-Castilla and
18 Rodríguez-Ruiz, 2008).

34 **4.3. Knowledge management in the horizontal vision of the EFQM Model**

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36 The interpretation of the relationships between the criteria is specified in the so-called transverse axes
37 of the model and assumes a horizontal vision (sub-criteria pertaining to different criteria), as opposed to
38 the traditional or vertical (criterion to criterion). The existence of these axes implies that by starting up
39 several improvement projects within the organization, synergistic effects can be obtained in other sub-
40 criteria. In this sense, global improvements in the organization cannot be achieved, if the different
41 aspects of the criteria of the model are not simultaneously addressed as interdependent elements (Calvo-
42 Mora *et al.*, 2015). Within these axes, one is expressly called *knowledge* (EFQM, 2003; Calvo-Mora *et*
43 *al.*, 2015), which includes sub-criteria pertaining to different criteria: 2b, 3d, 4e, 7a, 7b, 9a and 9b. In
44 addition, in the 2003 EFQM-EM, other axes related to KM were proposed, such as sustainability and
45 innovation, personnel and process methodology. On the other hand, organizations can identify and
46 create their own axes according to their needs.

The following tables (Table 3 and Table 4) summarize the relationships we have identified among the criteria and sub-criteria of the EFQM model and the KM processes and systems.

Insert Table 3 about here

As can be seen from Table 3, all the enabler criteria of the model consider or affect KM processes and systems. Even though all the criteria show obvious relationships with KM, in at least two of their sub-criteria, the case of the "People" criterion stands out. In this case, there are three sub-criteria affected and, in the case of one of them, specifically 3b, referring to the need to develop the knowledge and skills of people, it can be seen that the relationship is complete with respect to all elements of KM. Also emphasized for their high degree of relationship are sub-criteria 3e (information and knowledge management to support effective decision-making and build the capabilities of the organization), and 1b (involvement in the management-decisions system based on the available knowledge and stimulation of innovation and creativity). Table 4 shows the previously collected results criteria in the sense of considering all types of data, direct and indirect indicators, information, etc., which are in essence sources of knowledge for making management decisions. This justifies the fact that few cells are found in the table that are not marked.

Insert Table 4 about here

4.4. Knowledge management in the RADAR improvement approach

RADAR logic (Results, Approaches, Deploy, Assess and Review) provides a structured methodology to perform the self-assessment, based on the EFQM-EM (Sokovic *et al.*, 2010). The *approach* refers to how the organization plans and develops the method it will use to achieve the desired results (EFQM, 2012). In this sense, there must be a clear logic, based on relevant stakeholders, and it should be designed and developed through processes. KM is an essential element of the managerial approaches that are determined and implemented within the organization. The accumulated knowledge of the stakeholders will facilitate the diagram, or map of relationships, upon which the approach is based. Thus, the adoption of a specific management approach more especially affects the processes of creation and application of knowledge. *Deploy* evaluates the degree of implementation that the approach provides in terms of important and relevant areas (EFQM, 2012). KM facilitates the deployment of the approaches,

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3 especially when data, information and accessible and manageable knowledge are required, with updated
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5 technological tools. The knowledge management processes most closely linked with the deployment
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7 phase of the approach would be knowledge storage and transfer. *Assess, review and improvement*
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9 should verify the adequacy of the instruments and measurement indicators, regarding the effectiveness
10
11 and efficiency of the approaches and their deployments (EFQM, 2012). In addition, it has been recorded
12
13 that learning and creativity are used to generate opportunities for improvement and innovation. Finally,
14
15 it is necessary to understand the usefulness of the measurements, learning and creativity, at the time of
16
17 evaluation, establishing priorities and implementing improvements and innovations. The phase of KM
18
19 most directly linked to this phase is the application of knowledge, since it serves as a driver of learning,
20
21 creativity and continuous improvement. Regarding the *results*, it must be verified to what extent the
22
23 indicators used to measure the results are relevant and useful (EFQM, 2012). Thus, they must
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25 demonstrate their coherence with the strategy and defined objectives, as well as with the needs and
26
27 expectations of the stakeholders.
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30
31 The way in which RADAR proposes the measurement of the results is coincident with the characteristic
32
33 features required of information and data handled in a KMS. The RADAR logic evaluates the results to
34
35 the extent that they serve to generate knowledge as a qualitative perspective of their indicators (Gómez
36
37 Gómez *et al.*, 2011; Bolboli and Reiche, 2015).
38

39 **5. Discussion and implications**

40
41 The previous analysis allows us to answer the proposed research questions as follows.

42
43 *RQ1: Does the EFQM-EM consider knowledge to be a key strategic resource?*

44
45 Leading an organization along the path of excellence in any industry necessarily requires adequate KM.
46
47 The theoretical analysis carried out reveals the clear links, and even great similarities, between the two
48
49 scientific approaches.
50

51
52 The following table summarizes how KM is present in the 2013 EFQM-EM, and the synergistic nature
53
54 of their very broad relationship.
55

56
57 **Insert Table 5 about here**
58
59
60

1
2
3 In any of the relevant elements of EFQM-EM (see Table 5), essential guidance and elements are present
4
5 in all KMS. All the EFQM-EM criteria are emphasized in its own definition and monitoring approach
6
7 (guidelines and examples of excellence), the basis of the model or fundamental concepts, the dynamics
8
9 of continuous improvement and the RADAR logic diagram. All incorporate aspects of KM.

10
11 The percentage of inclusions or references to KM in the sub-criteria, referred to as enablers of
12
13 excellence, is not significant given that it appears evident that the EFQM-EM is not a benchmark of KM
14
15 but a broader management approach. Hence, various sub-criteria do not include references to elements
16
17 or significant aspects of KM.

18
19
20 Excellence is a path of continuous improvement in which shortcuts are not valid, and in which patience
21
22 and perseverance are the best elements with which organizations should equip themselves.

23
24 *RQ2: Can the EFQM-EM help create an adequate context for the success of knowledge management*
25
26 *processes and systems in an organization?*

27
28 For KM to be effective, it must be developed within a context that favours the proper development of
29
30 the phases that make up the KM process (Wang and Wang, 2016). The key variables of this context
31
32 (culture, organizational structure, technologies and information systems, and leadership and human
33
34 resources) make up the KMS. In this sense, the framework in which the EFQM-EM develops helps
35
36 construct and maintain this context, because they share the same principles and variables (Hsu and Shen,
37
38 2005; Ju *et al.*, 2006), as included in the fundamental concepts of excellence and other parts of the
39
40 EFQM-EM. In the same way, it can be identified how the design, implementation and development of
41
42 the EFQM-EM help the proper development of the KM process.

43
44
45 Before starting the KM process, the organization must identify and measure the knowledge it already
46
47 possesses. Much of this knowledge is formalized (explicit knowledge) and localized in the internal
48
49 processes of the organization (Davenport and Prusak, 1998). Regarding non-formalized knowledge
50
51 (tacit knowledge), the self-assessment methodology used by the EFQM-EM allows its localization, as
52
53 it carries out an in-depth analysis of what the organization does, who does it, where it is done and with
54
55 what resources (Calvo-Mora *et al.*, 2015). On the other hand, relevant instruments of identification and
56
57 measurement are the self-assessments and external assessments of the EFQM-EM. In addition, the
58
59 organization will have to estimate the necessary knowledge, which is determined by the environment
60

1
2
3 and which are the key elements to compete within it. The relationships that the organization maintains
4
5 with its main partners (suppliers, customers, distributors and competitors) provide it with much of the
6
7 information it needs to estimate this knowledge (Benavides and Quintana, 2005). The EFQM-EM
8
9 includes requirements and guidelines regarding the integration of customers, suppliers and partners to
10
11 share opportunities, experiences, knowledge and, ultimately, to optimize alliances with stakeholders.
12

13 Whenever the organization knows what knowledge it has and what it will need, it can determine its
14
15 knowledge gap and reflect on the best way to cover this through the generation of knowledge. This
16
17 *knowledge creation phase* is very important for the future development of the organization, since it
18
19 allows it to continuously adapt to changes in the environment (Davenport and Prusak, 1998). In general,
20
21 knowledge can be generated through activities aimed at the internal creation of knowledge or the
22
23 acquisition of external knowledge. For this phase to develop properly it is necessary to be carried out in
24
25 an environment that favours communication, creativity and change (Alavi and Leidner, 2001). These
26
27 principles and values are very much present in the organizations that implement the EFQM-EM (Calvo-
28
29 Mora *et al.*, 2015).
30
31

32 Once the knowledge is generated, it will have to be *stored* so that it can be transferred to the individuals,
33
34 groups or units that need to apply it. The stored knowledge constitutes the so-called organizational
35
36 memory (Nilakanta *et al.*, 2006). In this regard, the EFQM-EM urges the maintenance of certain
37
38 documented information (procedures, technical instructions, records and other technical, legal
39
40 documentation, etc.), which is a way to systematize what is done in the organization and who does it
41
42 (organizational memory), how it is done, when it is achieved, etc. In addition, this documented
43
44 information is a means to provide evidence of the results that are being achieved.
45
46

47 The adequate storage and structuring of the knowledge generated facilitates the *transfer* of best
48
49 practices. This phase is critical to the success of the KM process, since the transfer must produce changes
50
51 in the knowledge base and the abilities of individuals and groups (De Vries *et al.*, 2006). The transfer
52
53 of knowledge can be made through information or through experience, as well as within the organization
54
55 itself and between organizations. Knowledge is transferred using media, as a more efficient method to
56
57 spread explicit knowledge and to large groups of people. However, the transmission of non-formalized
58
59 (tacit) knowledge between people is more effective through experience, that is, through practice-based
60

1
2
3 learning. The use of models of excellence can facilitate the transfer of knowledge through information
4 and experience. Thus, through the results of the self- and external assessments, valid, reliable and
5 formalized information is obtained on what the organization is doing efficiently (best practices) and on
6 the aspects that must be improved, and the information can be disseminated internally among the
7 different areas easily and quickly. In addition, the self-assessment process, and the subsequent
8 implementation of the improvement and strengthening plans, are carried out through the constitution of
9 improvement teams or groups, which create a climate that favours the exchange of experiences and
10 mutual learning. In addition, other types of knowledge needed to compete are found in other
11 organizations and groups (suppliers, customers or competitors), that is, it may be necessary for the
12 transference to also occur between organizations. In this case, the use of the EFQM-EM makes it
13 possible to capture and disseminate information, since permanent communication links are established
14 with these groups. In addition, ad hoc groups can be set up between organizations to facilitate better
15 knowledge of the partners and the exchange of experiences (Calvo-Mora *et al.*, 2015).

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The main objective of the KM process must be to generate value for the agents that intervene in the process. For this, the knowledge generated, stored and transferred must be *applied* in an efficient manner (Davenport and Prusak, 1998). In this regard, the use of quality management approaches strengthens a continuous process aimed at improvement and learning. This is to say, the EFQM self-assessment does not only seek to obtain information about the degree of excellence an organization is achieving in its key activities and results, but also to use this information and diagnosis to learn, be creative and innovate.

RQ3: Does the integration of excellence management and KM, through the EFQM-EM, favour the emergence of dynamic capabilities within the organization?

Knowledge management is especially critical in changing markets. It is important to highlight that, in order to achieve a competitive advantage, what is important is not knowledge per se, but the ability of the company to apply knowledge and thus create new knowledge. Knowledge flows as a result of the application of quality management systems, and models allow the improvement of KM processes that take place in the company, leading to the creation of new knowledge, and its transference and application. This is where dynamic capabilities come into play. Given the characteristics of current environments, organizations need to develop dynamic capabilities to survive (Rothaermel and Hess,

2007; Barreto 2010; Dixon *et al.*, 2014; Khan and Naeem, 2018). In line with this idea, it is proposed that the implementation of excellence models seems to be a dynamic capability, which would result in an improvement in the ability of the company to manage its knowledge. For excellence models to improve KM, it is essential that they are designed, developed and ultimately aimed at improving the processes needed to manage organizational knowledge. The previous sections show that the EFQM-EM contemplates KM in its development and application.

In order to better understand this idea, it is necessary to distinguish between the dynamic capability and the operational capability that it seeks to reconfigure (Cepeda and Vera, 2007; Scarpin and Brito, 2018). The operational capability, in this case, is the ability of companies to manage their knowledge. This operational capacity allows companies to develop a competitive advantage through the processes of creation, conservation, protection, transference and application of knowledge. However, in current environments it is necessary for the company to continuously adapt to changes in the environment. Excellence models will act on this capability of the company, reconfiguring and improving it, so that the competitive advantage can be maintained over time (Lobo *et al.*, 2018).

The synergies shown in previous sections are materialized in KM, not only at the level of conceptual or essential bases of the approaches, but also, operationally, through the criteria and sub-criteria, axes and recommendations contemplated in them. The philosophy of the continuous improvement of learning, creativity and innovation, and the RADAR logic in the EFQM-EM, are the essence of the adaptation to the changing internal and external environment of the organizations.

With respect to the implications, at theoretical level, the study provides evidence with respect to the strong synergistic relationships presented by EFQM-EM and KM. At the level of the strategy and general policy of an organization, we have identified numerous similarities in the directives established in both management approaches. In the most operational sphere, RADAR logic and the essential drivers of excellence (learning, creativity and innovation) are essential elements for the success of KM.

On the other hand, the key aspects of knowledge and the synergies between EFQM-EM and KM identified in the study, can serve as a reference to explicitly incorporate key elements of KM in the new version of the EFQM-EM, which will be released by the end of 2019. These changes must affect the whole of the structure of the new model, including the fundamental concepts of excellence, the sub-

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2
3 criteria and the RADAR logic. There was no doubt that a change in the EFQM-EM is necessary to allow
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5 it to face new environmental conditions, its present and future users and the new business trends and
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7 management of the future.

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9 At the practical level, all organizations that attempt to advance towards the continuous improvement of
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11 quality in search of excellence must develop KM processes. Consequently, knowledge and its suitable
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13 management must be assumed as strategic resources of capital importance. Thus, the investment in
14
15 knowledge is essential to be able to obtain dynamic capabilities and distinguishing competences that
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17 lead the organization towards excellence. On the other hand, those organizations which do not currently
18
19 develop activities under the EFQM-EM framework but which do manage their knowledge, have taken
20
21 a certain path on the way towards excellence.

22
23 In addition, organizations must be aware of the utility of knowledge as a key value of their development.
24
25 For this, they would have to deploy actions related to: the connection of people around communities of
26
27 learning and practice; learning from experience as a team and to integrate that learning into
28
29 improvement; facilitating access to key documents and information in a context of "over information";
30
31 establishing measures to retain valuable knowledge; know and share good internal and external
32
33 practices; and, to relate the knowledge and collective intelligence to improvement and innovation.

34 35 36 37 **6. Conclusion, limitations and future research lines**

38
39 The world around us changes daily. If we do not want to see it through our own will, circumstances will
40
41 show it to us. Managing excellence, and doing it seriously, can no longer be the, perhaps chimerical,
42
43 desire of a visionary. It is, on the contrary, one of the keys for the maintenance and improvement of the
44
45 levels of quality of life of our society and, without a doubt, for the survival and improvement of the
46
47 competitiveness of the organizations with which we interact every day.

48
49 In this environment of continuous change, we must understand knowledge as an asset of vital
50
51 importance. No organization can afford to jeopardize or underuse the knowledge it acquires in the course
52
53 of its activity. In addition, it is necessary to maintain a permanent reflection on it to see if an organization
54
55 has the necessary knowledge to offer a product or service, according to what the customer wants.

56
57 Organizations that stand out for their levels of excellence achieved in their management and results,
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59 develop information and knowledge management systems to support their strategy and plans, in order
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3 to achieve their set objectives. Companies must identify what type of information and knowledge they
4
5 need, manage these intangible resources in a way that guarantees their integrity and security, provide
6
7 adequate access to potential users, and evaluate the usefulness, effectiveness and efficiency of their own
8
9 knowledge and the storage, protection and access of these mechanisms.

10
11 In short, to be competitive, organizations need to continuously generate and assimilate new knowledge
12
13 and skills. Therefore, quality and excellence as a management philosophy, that is based on continuous
14
15 improvement, innovation and learning, can serve to create a context and conditions for the development
16
17 of sustainable competitive advantages. Furthermore, knowledge management initiatives have no
18
19 meaning if they are not systematically developed, and here the framework offered by models of
20
21 excellence is especially useful.

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23
24 Finally, an inherent limitation of the study is that it is a theoretical approach and an exploratory
25
26 investigation. In this sense, it is necessary to continue delving into how organizations actively
27
28 incorporate the elements of KM, and the stages of the KM process, into their QM practices. The study
29
30 also verifies that the systematic application of the EFQM-EM leads to the efficient development of KM.
31
32 This aspect will be the focus of future research. Those aspects (strengths or weaknesses in the
33
34 management practices) that have greater effect in the different phases of the KM process could also be
35
36 analysed. Another limitation would be related to the universal character of the EFQM-EM, that is, is it
37
38 valid for any type of organization, independent of size or organizational structure. In this sense, it would
39
40 be interesting to investigate how to strengthen KM through EFQM-EM in very hierarchical structures,
41
42 as knowledge is developed to a greater degree in collaborative organizations which share knowledge
43
44 transversely, going beyond the vision of area or department; as well as analyse the differences in the
45
46 integration of KM and the EFQM-EM in small and large companies.
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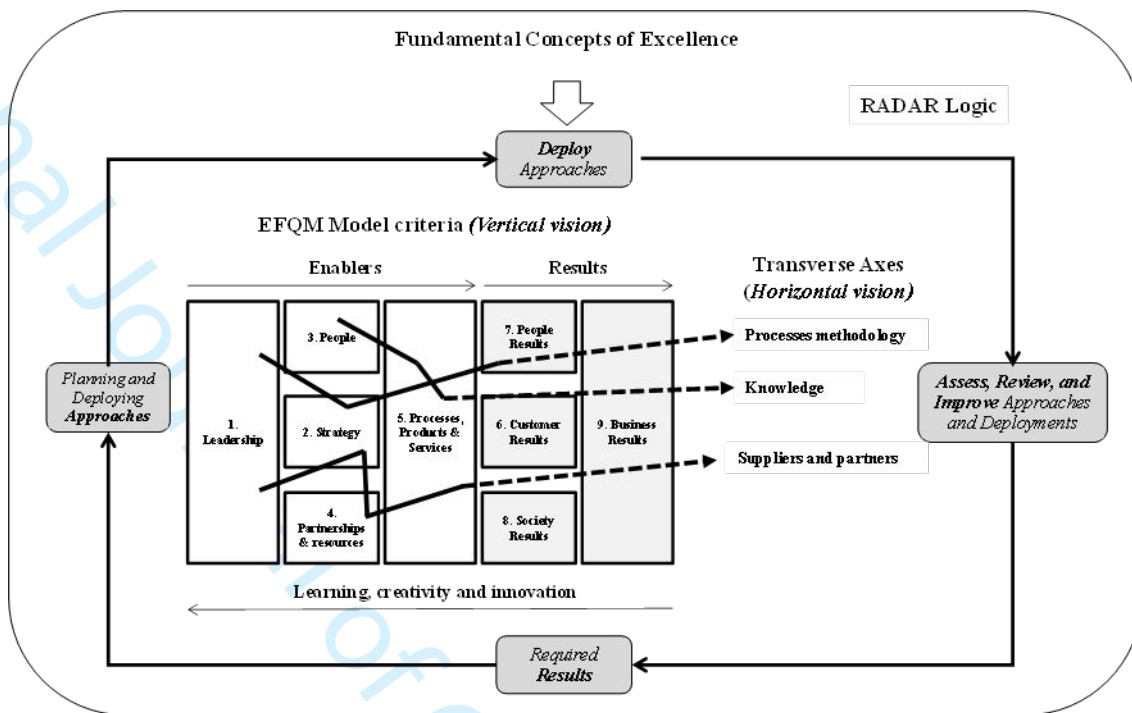


Figure 1. EFQM Excellence Model components

<i>Fundamental concepts of excellence</i>	<i>Knowledge management issues</i>
<i>Leading with vision, inspiration and integrity</i>	Leading with vision requires internalizing and taking into account how knowledge is included in the business strategy of any organization. Therefore, it must reflect on how it effectively serves to obtain dynamic capabilities that improve the competitive position
<i>Succeeding through the talent of people</i>	Excellent organizations recognize the growing importance of the intellectual capital of their people and use their knowledge for the benefit of the entire organization
<i>Harnessing creativity and innovation</i>	Excellent organizations continuously learn and collect and share the knowledge of their people to maximize learning throughout the organization.
<i>Developing organizational capability</i>	Excellent organizations should know and understand their current and potential capabilities to achieve their strategic objectives. In addition, they must establish mechanisms to identify potential alliance opportunities that increase their capabilities and their ability to generate additional value for stakeholders.
<i>Managing with agility</i>	Excellent organizations identify the information that allows them to anticipate changes, both internal and external, and which could be potential opportunities or threats
<i>Adding value for customers</i>	This aspect is closely related to the different phases of the KM process and thus, it is observed from its acquisition until its subsequent transmission

Table 1. Aspects of knowledge management present in the fundamental concepts of excellence.

<i>Criterion 1. Leadership</i>	<i>Knowledge management issues</i>
1a. Leaders develop the mission, vision, values and ethics and act as role models	<ul style="list-style-type: none"> • Visionary leader who inspires and serves as a behavioral benchmark by incorporating a series of principles and values linked to innovation, continuous improvement and KM into organizational culture
1b. Leaders define, monitor, review and drive the improvement of the organization's management system and performance	<ul style="list-style-type: none"> • Decision making guidelines which must be based on all available knowledge to interpret the current state of the organization and thus be able to better project the desired future state • Stimulation of innovation and creativity
1c. Leaders engage with external stakeholders	<ul style="list-style-type: none"> • Managers must collaborate in agreements, contracts or affiliations with customers, suppliers and other partners
1d. Leaders reinforce a culture of excellence among the organization's people	<ul style="list-style-type: none"> • Leadership from the perspective of behavior with cultural reference that serves as a motivating element and support for the generation of new ideas, new ways of thinking, the impulse to innovation and common development
<i>Criterion 2. Strategy</i>	<i>Knowledge management issues</i>
2b. Strategy is based on understanding internal performance and capabilities	<ul style="list-style-type: none"> • Ability to understand organizational performance and capabilities, analyzing trends, data and information from partners, among others
2c. Strategy and supporting policies are developed, reviewed and updated	<ul style="list-style-type: none"> • Guidelines referring to the understanding of key competences and how they are reviewed and updated in order to provide greater value to stakeholders
<i>Criterion 3. People</i>	<i>Knowledge management issues</i>
3b. People's knowledge and capabilities are developed	<ul style="list-style-type: none"> • Define the skills, competencies and staff performance levels • Perform effective planning that attracts, develops and retains the necessary talent • Develop people's skills and competences to ensure their abilities
3c. People are aligned, involved and empowered	<ul style="list-style-type: none"> • Alignment of people with the needs of the organization through an involvement and assumption of responsibilities ranging from recognition and encouragement to innovation, through the creation of a culture of creativity and innovation that favors the open mentality of people
3d. People communicate effectively throughout the organization	<ul style="list-style-type: none"> • Guidelines to favor and encourage the sharing of information, knowledge and best practices • A culture of continuous improvement throughout the value chain, favoring collaboration and teamwork
<i>Criterion 4. Partnerships and Resources</i>	<i>Knowledge management issues</i>
4a. Partners and suppliers are managed for sustainable benefit	<ul style="list-style-type: none"> • Networks to identify opportunities for potential alliances or mutual working, supporting one another with expertise, resources and knowledge
4d. Technology is managed to support the delivery of strategy	<ul style="list-style-type: none"> • Guidelines for the identification and evaluation of alternative and emerging technologies that improve results and optimize the capabilities and knowledge of the organization
4e. Information and knowledge are managed to support effective decision making and to build the organization's capability	<ul style="list-style-type: none"> • Leaders with accurate and sufficient information that will help them to make decisions in a timely manner • Transformation of data into information and, when appropriate, into knowledge that can be shared and used effectively • Initiatives to involve relevant stakeholders and uses their knowledge in the generation of ideas and innovation • Adequate access to information and knowledge relevant to the people in the organization and external users while ensuring the protection of intellectual property of the organization and security of information and knowledge • Learning and collaboration networks to identify opportunities for creativity, innovation and improvement
<i>Criterion 5. Processes, Products & Services</i>	<i>Knowledge management issues</i>
5b. Products and services are developed to create optimum value for customers	<ul style="list-style-type: none"> • Market research and the participation and involvement of customers as sources of innovation and creation of value
5d. Products and services are produced, delivered and managed	<ul style="list-style-type: none"> • Guidelines to ensure that people have the necessary resources, competencies and degree of autonomy to be able to bring about customer experiences that maximize their level of satisfaction

Table 2. Criteria and sub-criteria of the EFQM model and knowledge management issues.

KM SYSTEMS AND PROCESSES		ENABLER CRITERIA AND SUB-CRITERIA																							
		Leadership					Strategy				People					Partnerships and Resources					Processes, Products and Services				
		a	b	c	d	e	a	b	c	d	a	b	c	d	e	a	b	c	d	e	a	b	c	d	e
People	Culture				X						X	X	X		X						X				
	Climate		X								X	X	X											X	
KM Processes	Creation		X				X	X			X				X					X		X			
	Storage		X								X									X					
	Transference		X		X						X									X					
	Application		X		X		X	X			X									X		X			
Technology	Software										X							X	X				X		
	Hardware										X							X	X				X		

Table 3. Knowledge management in the enabler criteria of the EFQM model.

KM SYSTEMS AND PROCESSES		RESULTS CRITERIA AND SUB-CRITERIA							
		Customers		People		Society		Business	
		(1)	(2)	(1)	(2)	(1)	(2)	(3)	(4)
People	Culture	X		X	X	X	X		X
	Climate			X	X	X	X		
KM Processes	Creation	X	X	X	X	X	X	X	X
	Storage	X	X	X	X	X	X	X	X
	Transference	X	X	X	X	X	X	X	X
	Application	X	X	X	X	X	X	X	X
Technology	Software	X	X	X	X	X	X	X	X
	Hardware	X	X	X	X	X	X	X	X

(1) Perception Indicators (2) Performance Indicators (3) Key Results of the Activity (4) Key Indicators of the Activity

Table 4. Knowledge management in the results criteria of the EFQM model.

Element of the model	Mentions	Total elements	Mention percentage
Fundamental concepts	6	8	75%
Criteria	9	9	100%
Sub-criteria Agents 1 ¹	2, 4	5	Approx. 48%
Sub-criteria Agents 2 ²	38	192	Approx. 20%
Sub-criteria Results 1 ¹	2	2	100%
Sub-criteria Results 2 ²	58	64	Approx. 91%
Dynamics / essence of improvement ³	3	3	100%
RADAR logic	4	4	100%

¹ Average percentage of mentions in sub-criteria on the total criteria
² Average percentage of mentions in sub-criteria on total sub-criteria
³ Learning, creativity and innovation

Table 5. Relationships and synergies between KM and the Management of Excellence.

Response to REVIEWERS

REVIEWER: 1

Recommendation: Major Revision

Comments:

I am quite sure this work has strong potential to be significant work. I like the idea of this research, but it needs more works to be more academic. The author writes this article as more appropriate for technical people rather than academia.

Thank you very much. We much appreciate your suggestions. The new version of the paper has avoided some mistakes and has improved considerably.

Additional Questions:

1. Originality: Does the paper contain new and significant information adequate to justify publication?:

There is a potential for this research to be significant to justify publication, but it needs a lot of work. The following sections explain that.

Thank you very much.

2. Relationship to Literature: Does the paper demonstrate an adequate understanding of the relevant literature in the field and cite an appropriate range of literature sources? Is any significant work ignored?:

- **The author does not show how this research is different from other researches that combine KW with EFQM or Excellence. Although the author explain in details KM, EFQM model, but this explanation is inadequate to show how others combine KW with EFQM or Excellence.**
- **There are no mention for the research gap, and the author does not show any literature leads to why his/her research is valuable and different from others.**
- **This article doesn't reveal any literature combine both KM with EFQM or Excellence.**

After considering your thoughtful suggestion, we have included more recent literature on KM, QM and excellence explaining the contribution of these papers in order to show to what extent our paper is different from previous ones:

“The literature has shown that KM can coexist with quality management (QM), since they share key factors of success such as: approach to clients and others stakeholders, involvement of human resources, leadership, management based on data and information systems, and process management (Molina et al., 2004; Hsu and Shen, 2005; Ju et al., 2006; Colurcio, 2009; Hung et al., 2010; Stewart and Waddell, 2008; Asif et al., 2013; Marchiori and Mendes, 2018). In addition, there is evidence that the association of KM and QM has the potential to generate competitive advantages and the long-term survival of organizations (Chourides et al., 2003; Marcus and Naveh, 2005; Hung et al., 2010), as well as positive effects in the performance and results (Linderman et al., 2004; Molina et al., 2004; Hsu and Shen, 2005; Loke et al., 2012; Calvo-Mora et al., 2015; Qasrawi et al., 2017; Yusr et al., 2017). Nevertheless, there is no consensus on the nature of this relationship. Thus, some works point to a reciprocal and synergistic relationship between KM and QM (Linderman et al., 2004; Martinez-Costa and

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3 *Jimenez-Jimenez, 2008; Calvo-Mora et al., 2015; Wilson and Campbell, 2018). Others consider*
4 *KM as a factor that facilitates the implementation of QM (Stewart and Waddell, 2008;*
5 *Kaziliunas, 2011; McFadden et al., 2014), and others suggest that the practice of QM serves as*
6 *a support to the development of an effective KM (Chourides et al., 2003; Molina et al., 2004;*
7 *Molina et al., 2007; Colurcio, 2009; Loke et al., 2012; Asif et al., 2013; Ooi, 2014; Honarpour*
8 *et al., 2017; Wilson and Campbell, 2018)."*
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11 In addition, we have made our research gap more explicit and, hopefully clearer:

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13 *"In this context, Martinez-Costa and Jimenez-Jimenez (2008) and Marchiori and Mendes*
14 *(2018) affirm that systematic efforts are necessary to develop a solid theoretical framework that*
15 *explains the relationship between QM and KM. In addition, the literature still lacks evidence on*
16 *reference models and key factors that could contribute to an effective and efficient integration*
17 *of QM and KM. Indeed, this work attempts to cover this gap. Firstly, the literature on KM, QM*
18 *and excellence are analysed in a systematic and structured manner. Secondly, an analysis of the*
19 *content of the European Foundation for Quality Management Excellence Model (EFQM-EM) is*
20 *carried out, attempting to identify the elements that connect with the KMS and the phases of the*
21 *KM process. Thirdly, it is considered how the integration and systematic application of KM and*
22 *QM favour the appearance of dynamic capabilities, which allow organizations to reach*
23 *sustainable competitive advantages over time."*
24

25 A new epigraph 2.3. Relationship between knowledge, quality and excellence management also
26 has been included in the literature review section:

27
28 *"2.3. Relationship between knowledge, quality and excellence management*

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30 *Nowadays, few researchers doubt that QM and KM are compatible and complementary*
31 *management approaches. However, their relationship has been approached from different*
32 *perspectives and, in many cases, partial aspects have been studied which hinder the*
33 *understanding of the complexity of this relationship. After a review of the literature and a*
34 *bibliometric analysis, Marchiori and Mendes (2018) identified, on the one hand, studies that put*
35 *the emphasis on how the principles and practices of QM can serve as a starting point to*
36 *implement KM initiatives, effectively and efficiently. Other works accentuate the fact that KM is*
37 *a critical element for the success of the QM initiatives and for obtaining better results. Another*
38 *group of increasingly numerous studies, concentrates on analysing the best way to integrate*
39 *both management approaches, so that synergies are obtained which favour the achievement of*
40 *sustainable competitive advantages for organizations.*

41
42 *On the other hand, it is common for researchers to approach the relationship between QM and*
43 *KM through the most widespread QM approaches (ISO 9000 standards and excellence models),*
44 *either through the elements of the KMS, or the phases of the KM process.*

45
46 *Thus, for Lin and Wu (2005) and Marcus and Naveh (2005) the ISO 9001 standard is an*
47 *information exchange tool that can be used to obtain the knowledge necessary to improve the*
48 *quality and the performance in organizations. Also, it provides an appropriate framework*
49 *within which to order, structure, create and transfer knowledge. Along this line, Tang and Tong*
50 *(2007) indicate how the auditing processes within the ISO 9000 standards framework, through*
51 *the detection of nonconformities, aids the application of remedial actions and the design of*
52 *preventive actions, which favour the development of the KM process. More recently, Wilson and*
53 *Campbell (2016, 2018) identify relationships of the foundations of KM with the principles of*
54 *QM of the 2015 ISO 9000 standards and the management requirements of the 2015 ISO 9001*
55 *standards. In addition, these authors consider that the QM systems can provide a coherent*
56 *structure to help organizations to apply knowledge requirements in practice.*

57
58 *With respect to the excellence models, Benavides and Quintana (2005) propose a*
59 *systematization of the KM phases and systems, based on the internalization of the values of total*
60 *quality culture, and the application of the EFQM-EM. Martín-Castilla and Rodríguez-Ruiz*
(2008) make a conceptual analysis of the relationships between the EFQM-EM criteria and the

components of the intellectual capital (human, structural and relational), reaching the conclusion that EFQM-EM is a suitable framework for organizational KM. Allameh et al. (2014) provide evidence of how organizations who use the EFQM-EM obtain valuable data on the measurement of knowledge exchange and performance improvement. On the other hand, Calvo-Mora et al. (2015) analyse the potential of the EFQM-EM to design and to implement KM which improves the key results of the organization. For this they use a horizontal vision of the EFQM-EM based on transverse axes. The results show how the EFQM-EM can be a valid framework to implement KM. In addition, the use of process methodology and the involvement of suppliers and partners are key factors for the KM to have a significant impact on the key results. Ooi (2009) suggests a theoretical framework that relates the criteria of the Malcolm Baldrige model (leadership, strategic planning, information and analysis, process management, human resource management and customer focus) to the phases of the KM process (acquisition, dissemination and application). Later, Ooi (2014, 2015) empirically validated this model and corroborated its effectiveness in manufacturing and service companies. On the other hand, Akdere (2009) explores the relationship between KM and QM, within the framework of the Malcolm Baldrige model, and analyses its influence in the development of human resources to improve the performance of the organization.

Regarding KMS, Hsu and Shen (2005) and Stewart and Waddell (2008) find similarities between KMS and QM systems, through elements such as human resources management, leadership and empowerment. For Chourides et al. (2003) the QM programmes have provided a solid base for the implementation of KM, as there is complementarity in elements, such as, the cultural principles and values, the emphasis on teamwork, continuous improvement, process management and information and communications technology.

Finally, we found studies that analyse the relationship of the KM process phases with quality. Thus, Linderman et al. (2004) propose an integrated vision of quality and knowledge using Nonaka's theory of knowledge creation. This perspective helps to clarify how quality practices can lead to the creation and retention of knowledge and how KM provides information on the effective implementation of QM. Asif et al. (2013), Yusr et al. (2017) and Qasrawi et al. (2017) indicate that the improvement of business performance requires the acquisition and integration of new knowledge, throughout the organization. In addition, a series of QM practices, such as continuous improvement, process management and teamwork, are identified that can contribute to strengthening the phases of the knowledge creation process. Colurcio (2009) affirms that QM has been demonstrated to be an effective catalyst of the generation and the diffusion of knowledge, as it provides policies and tools that are intrinsically useful, such as teamwork, communication and process management. Molina et al. (2007) confirm the importance of the different QM practices (suppliers and customer co-operation, teamwork, autonomy and process control) in the internal and external transfer of knowledge. For Kaziliunas (2011), McFadden et al. (2014) and Martinez-Costa and Jimenez-Jimenez (2008), learning and the KM process allows important information to be compiled, created, stored and utilised, which increases the effectiveness of QM and the organizational performance."

3. Methodology: Is the paper's argument built on an appropriate base of theory, concepts, or other ideas? Has the research or equivalent intellectual work on which the paper is based been well designed? Are the methods employed appropriate?:

- **No explanation for any methodology for this research, the author begins the analysis without any detail on how to approach that. No formal structure for this article (no research problem or even statement, no literature shows how this research is different from others, no methodology).**

We absolutely agree with your point about research methodology. It is true that in the previous version do not appear explicitly that our paper consists of a literature review and a content analysis of scientific literature on KM, QM, EFQM-EM, and their relationships. Now, we have added the section 3. Methodology and the following paragraphs:

“The methodology followed in this study has its origin in the posed research questions, and has followed the guidelines developed by studies with similar objectives, such as those of Martín-Castilla and Rodríguez-Ruiz (2008), Ooi (2009) and Wilson and Campbell (2018). As stated previously, the proposed research questions are:

RQ1: Does the EFQM-EM consider knowledge as a key strategic resource?

RQ2: Can the EFQM-EM help create an adequate context for the success of knowledge management processes and systems in an organization?

RQ3: Does the integration of management excellence and knowledge management, through the EFQM-EM, favour the emergence of dynamic capabilities in the organization?

This led to the identification, analysis and review of existing scientific literature on KM, QM, EFQM-EM and their relationships, for which the Web of Science and Scopus databases were used. In addition, the latest version of the 2013 EFQM-EM, acquired from the European Foundation for Quality Management (EFQM), was used as the main source for content analysis. The content analysis is based on reading (textual or visual) as an information collection instrument. This reading, unlike common reading, must be made following a scientific method, that is, it must be systematic, objective, replicable and valid (Krippendorff and Bock, 2008). In short, the content analysis allows us to make a theoretical analysis of KM from the management philosophy included in the structure of the 2013 EFQM-EM.”

Now, we also mention it in the abstract:

“Design/methodology/approach: A literature review and a content analysis are carried out which show how the current version of the EFQM model includes the key aspects of the knowledge management systems and its process. Also, the relationships and synergies between both considered management approaches are analysed: quality management and knowledge management.”

According to the structure of the article, we have added new headings in order to follow a formal structure. Now, the structure is as follows:

1. Introduction
2. Literature review
3. Methodology
4. Results
5. Discussion and implications
6. Conclusion, limitations and future research lines

- **It is shown in this article that the main purpose is to explain to what extent KM issues are embedded in the EFQM. The author did the analysis in vice versa, the author starts with EFQM elements and then discuss in a fuzzy way how these elements are conceptualizes around KMP or KMS. It is then must discuss the KMS or KMP in EFQM and thus can achieve the purpose of this article.**

Thank you very much. Maybe this aspect was not appropriately expressed in the previous version of the paper. Specifically, among other aspects, our study aims to analyse the extent to which the structure of the EFQM-EM includes the key elements of the KM and KMS process. Therefore, through the implementation of the model and the development of self-evaluations, the effective development of the phases of KM can be strengthened and the basis for an adequate context for the KMS can be established. These aspects are developed in detail in the RQ2: Can the EFQM-EM help create an adequate context for the success of knowledge management processes and systems in an organization?

4. Results: Are results presented clearly and analysed appropriately? Do the conclusions adequately tie together the other elements of the paper?:

- **The discussion in the results section is so long and need more focus on the aim of this article. Instead of doing long paragraphs, the author can make it easier and more readable, if there are tables or diagrams summarize the discussion. It will be more appropriate, if the author summarize his results according to KMS or KMP instead of EFQM elements.**

Thank you for your comments. We will try to address your concerns in our best way, so we have included Table 2 to summarize the aspects of KM in the criteria and sub-criteria of the EFQM-EM.

5. Implications for research, practice and/or society: Does the paper identify clearly any implications for research, practice and/or society? Does the paper bridge the gap between theory and practice? How can the research be used in practice (economic and commercial impact), in teaching, to influence public policy, in research (contributing to the body of knowledge)? What is the impact upon society (influencing public attitudes, affecting quality of life)? Are these implications consistent with the findings and conclusions of the paper?:

- **No recommendation for future Works; No limitation for this work; No Managerial or even academic contribution stated in this works**

We apologise for these omissions. The new version of the paper includes theoretical and managerial implications, limitations and future research lines.

- **One of the recommendation that can be revealed by this works, if it is done according to the above guidelines; it is important to upgrade or update new version of EFQM to have KMS or KMP explicitly in any model components. Then by doing that, when organisational competitiveness, productivity and performance are assessed according to EFQM, it will be then KMS and KMP are assessed as well.**

We would like to thank specially for this suggestion. In fact, we have included it in the implication section:

“On the other hand, the key aspects of knowledge and the synergies between EFQM-EM and KM identified in the study, can serve as a reference to explicitly incorporate key elements of KM in the new version of the EFQM-EM, which will be released by the end of 2019. These changes must affect the whole of the structure of the new model, including the fundamental concepts of excellence, the sub-criteria and the RADAR logic. There was no doubt that a change in the EFQM-EM is necessary to allow it to face new environmental conditions, its present and future users and the new business trends and management of the future.”

- **This work can be more valuable and very significant , if the author add areal case on how KMS or KMP are embedded in components of EFQM**

Thank you again. Although this paper aims to carry out a literature review and a content analysis, we will consider this suggestion in the future.

6. Quality of Communication: Does the paper clearly express its case, measured against the technical language of the field and the expected knowledge of the journal's

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3 **readership? Has attention been paid to the clarity of expression and readability, such as**
4 **sentence structure, jargon use, acronyms, etc.:**

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6 • **In particular, the writing, expressions and grammar of this paper are comply with**
7 **the standard of any academic paper.**

8 Thank you again.
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- 10
11 • **Although, the author uses simple language to present complex technical concepts,**
12 **author does not use examples, cases to clarify some technical issues in this article.**

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14 As we have said before, we will consider the addition of cases in future research studies.
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REVIEWER: 2**Recommendation: Major Revision****Comments:**

Although the paper focuses on an interesting topic that links KM to EFQM, it needs to consider the following revisions to be ready for publication in the IJQRM as follows:

Thank you for your comments and your suggestions as to how we might improve the paper.

1. Recent literature on KM, Quality and EFQM and their interrelationships must be discussed and reflected upon

You are right. The previous version of the paper lacks a more exhaustive review of the recent literature on KM, quality and excellence. Therefore, a new epigraph 2.3. Relationship between knowledge, quality and excellence management has been included in the literature review section:

“2.3. Relationship between knowledge, quality and excellence management

Nowadays, few researchers doubt that QM and KM are compatible and complementary management approaches. However, their relationship has been approached from different perspectives and, in many cases, partial aspects have been studied which hinder the understanding of the complexity of this relationship. After a review of the literature and a bibliometric analysis, Marchiori and Mendes (2018) identified, on the one hand, studies that put the emphasis on how the principles and practices of QM can serve as a starting point to implement KM initiatives, effectively and efficiently. Other works accentuate the fact that KM is a critical element for the success of the QM initiatives and for obtaining better results. Another group of increasingly numerous studies, concentrates on analysing the best way to integrate both management approaches, so that synergies are obtained which favour the achievement of sustainable competitive advantages for organizations.

On the other hand, it is common for researchers to approach the relationship between QM and KM through the most widespread QM approaches (ISO 9000 standards and excellence models), either through the elements of the KMS, or the phases of the KM process.

Thus, for Lin and Wu (2005) and Marcus and Naveh (2005) the ISO 9001 standard is an information exchange tool that can be used to obtain the knowledge necessary to improve the quality and the performance in organizations. Also, it provides an appropriate framework within which to order, structure, create and transfer knowledge. Along this line, Tang and Tong (2007) indicate how the auditing processes within the ISO 9000 standards framework, through the detection of nonconformities, aids the application of remedial actions and the design of preventive actions, which favour the development of the KM process. More recently, Wilson and Campbell (2016, 2018) identify relationships of the foundations of KM with the principles of QM of the 2015 ISO 9000 standards and the management requirements of the 2015 ISO 9001 standards. In addition, these authors consider that the QM systems can provide a coherent structure to help organizations to apply knowledge requirements in practice.

With respect to the excellence models, Benavides and Quintana (2005) propose a systematization of the KM phases and systems, based on the internalization of the values of total quality culture, and the application of the EFQM-EM. Martín-Castilla and Rodríguez-Ruiz (2008) make a conceptual analysis of the relationships between the EFQM-EM criteria and the components of the intellectual capital (human, structural and relational), reaching the conclusion that EFQM-EM is a suitable framework for organizational KM. Allameh et al. (2014) provide evidence of how organizations who use the EFQM-EM obtain valuable data on the measurement of knowledge exchange and performance improvement. On the other hand, Calvo-Mora et al. (2015) analyse the potential of the EFQM-EM to design and to implement KM which improves the key results of the organization. For this they use a horizontal vision of

the EFQM-EM based on transverse axes. The results show how the EFQM-EM can be a valid framework to implement KM. In addition, the use of process methodology and the involvement of suppliers and partners are key factors for the KM to have a significant impact on the key results. Ooi (2009) suggests a theoretical framework that relates the criteria of the Malcolm Baldrige model (leadership, strategic planning, information and analysis, process management, human resource management and customer focus) to the phases of the KM process (acquisition, dissemination and application). Later, Ooi (2014, 2015) empirically validated this model and corroborated its effectiveness in manufacturing and service companies. On the other hand, Akdere (2009) explores the relationship between KM and QM, within the framework of the Malcolm Baldrige model, and analyses its influence in the development of human resources to improve the performance of the organization.

Regarding KMS, Hsu and Shen (2005) and Stewart and Waddell (2008) find similarities between KMS and QM systems, through elements such as human resources management, leadership and empowerment. For Chourides et al. (2003) the QM programmes have provided a solid base for the implementation of KM, as there is complementarity in elements, such as, the cultural principles and values, the emphasis on teamwork, continuous improvement, process management and information and communications technology.

Finally, we found studies that analyse the relationship of the KM process phases with quality. Thus, Linderman et al. (2004) propose an integrated vision of quality and knowledge using Nonaka's theory of knowledge creation. This perspective helps to clarify how quality practices can lead to the creation and retention of knowledge and how KM provides information on the effective implementation of QM. Asif et al. (2013), Yusr et al. (2017) and Qasrawi et al. (2017) indicate that the improvement of business performance requires the acquisition and integration of new knowledge, throughout the organization. In addition, a series of QM practices, such as continuous improvement, process management and teamwork, are identified that can contribute to strengthening the phases of the knowledge creation process. Colurcio (2009) affirms that QM has been demonstrated to be an effective catalyst of the generation and the diffusion of knowledge, as it provides policies and tools that are intrinsically useful, such as teamwork, communication and process management. Molina et al. (2007) confirm the importance of the different QM practices (suppliers and customer co-operation, teamwork, autonomy and process control) in the internal and external transfer of knowledge. For Kaziliunas (2011), McFadden et al. (2014) and Martinez-Costa and Jimenez-Jimenez (2008), learning and the KM process allows important information to be compiled, created, stored and utilised, which increases the effectiveness of QM and the organizational performance."

2. Research methodology should be clearly mentioned

We absolutely agree with your point about research methodology. It is true that in the previous version do not appear explicitly that our paper consists of a literature review and a content analysis of scientific literature on KM, QM, EFQM-EM, and their relationships. Now, we have added the section 3. Methodology and the following paragraphs:

"The methodology followed in this study has its origin in the posed research questions, and has followed the guidelines developed by studies with similar objectives, such as those of Martín-Castilla and Rodríguez-Ruiz (2008), Ooi (2009) and Wilson and Campbell (2018). As stated previously, the proposed research questions are:

RQ1: Does the EFQM-EM consider knowledge as a key strategic resource?

RQ2: Can the EFQM-EM help create an adequate context for the success of knowledge management processes and systems in an organization?

RQ3: Does the integration of management excellence and knowledge management, through the EFQM-EM, favour the emergence of dynamic capabilities in the organization?

This led to the identification, analysis and review of existing scientific literature on KM, QM, EFQM-EM and their relationships, for which the Web of Science and Scopus databases were used. In addition, the latest version of the 2013 EFQM-EM, acquired from the European Foundation for Quality Management (EFQM), was used as the main source for content analysis. The content analysis is based on reading (textual or visual) as an information collection instrument. This reading, unlike common reading, must be made following a scientific method, that is, it must be systematic, objective, replicable and valid (Krippendorff and Bock, 2008). In short, the content analysis allows us to make a theoretical analysis of KM from the management philosophy included in the structure of the 2013 EFQM-EM.”

Now, we also mention it in the abstract:

“Design/methodology/approach: A literature review and a content analysis are carried out which show how the current version of the EFQM model includes the key aspects of the knowledge management systems and its process. Also, the relationships and synergies between both considered management approaches are analysed: quality management and knowledge management.”

3. The results should be properly discussed and reflected upon using recent literature

After considering your suggestion, we have reinforced our results section including some references to support our statements.

4. Implications for theory, practice, and social impact should be discussed

As you mention, theoretical and managerial implications are missing in the previous version of the paper. Now, we have incorporated the following paragraphs:

“With respect to the implications, at theoretical level, the study provides evidence with respect to the strong synergistic relationships presented by EFQM-EM and KM. At the level of the strategy and general policy of an organization, we have identified numerous similarities in the directives established in both management approaches. In the most operational sphere, RADAR logic and the essential drivers of excellence (learning, creativity and innovation) are essential elements for the success of KM.

On the other hand, the key aspects of knowledge and the synergies between EFQM-EM and KM identified in the study, can serve as a reference to explicitly incorporate key elements of KM in the new version of the EFQM-EM, which will be released by the end of 2019. These changes must affect the whole of the structure of the new model, including the fundamental concepts of excellence, the sub-criteria and the RADAR logic. There was no doubt that a change in the EFQM-EM is necessary to allow it to face new environmental conditions, its present and future users and the new business trends and management of the future.

At the practical level, all organizations that attempt to advance towards the continuous improvement of quality in search of excellence must develop KM processes. Consequently, knowledge and its suitable management must be assumed as strategic resources of capital importance. Thus, the investment in knowledge is essential to be able to obtain dynamic capabilities and distinguishing competences that lead the organization towards excellence. On the other hand, those organizations which do not currently develop activities under the EFQM-EM framework but which do manage their knowledge, have taken a certain path on the way towards excellence.

In addition, organizations must be aware of the utility of knowledge as a key value of their development. For this, they would have to deploy actions related to: the connection of people around communities of learning and practice; learning from experience as a team and to integrate that learning into improvement; facilitating access to key documents and information in a context of "over information"; establishing measures to retain valuable knowledge; know

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2
3 *and share good internal and external practices; and, to relate the knowledge and collective*
4 *intelligence to improvement and innovation.”*
5
6

7 **5. Proofreading should be maintained**

8
9 We have sent the paper to a professional copyeditor in order to improve the English of the
10 paper.
11

12 **Additional Questions:**

13
14
15 **1. Originality: Does the paper contain new and significant information adequate**
16 **to justify publication?: Yes.**
17

18 Thank you very much.
19

20
21 **2. Relationship to Literature: Does the paper demonstrate an adequate**
22 **understanding of the relevant literature in the field and cite an appropriate range of**
23 **literature sources? Is any significant work ignored?:**
24

- 25 • **Recent literature on KM and Quality issues are not covered**

26 As we have stated before, the previous version of the paper lacks a more exhaustive review of
27 the recent literature on KM, quality and excellence. Therefore, a new epigraph 2.3. Relationship
28 between knowledge, quality and excellence management has been included in the literature
29 review section.
30

31
32
33 **3. Methodology: Is the paper's argument built on an appropriate base of theory,**
34 **concepts, or other ideas? Has the research or equivalent intellectual work on which the**
35 **paper is based been well designed? Are the methods employed appropriate?:**
36

- 37 • **No. There is no appropriate methodology**

38 As we have said before, we absolutely agree with your point about research methodology. It is
39 true that in the previous version do not appear explicitly that our paper consists of a literature
40 review and a content analysis of scientific literature on KM, QM, EFQM-EM, and their
41 relationships. Now, we have added the section 3. Methodology and the following paragraphs.
42
43

44
45 **4. Results: Are results presented clearly and analysed appropriately? Do the**
46 **conclusions adequately tie together the other elements of the paper?:**

- 47 • **To some extent. The results are not properly discussed nor reflected upon using**
48 **recent literature.**

49 After considering your suggestion, we have reinforced our results section including some
50 references to support our statements.
51
52

53
54 **5. Implications for research, practice and/or society: Does the paper identify**
55 **clearly any implications for research, practice and/or society? Does the paper bridge the**
56 **gap between theory and practice? How can the research be used in practice (economic and**
57 **commercial impact), in teaching, to influence public policy, in research (contributing to**
58 **the body of knowledge)? What is the impact upon society (influencing public attitudes,**
59 **affecting quality of life)? Are these implications consistent with the findings and**
60 **conclusions of the paper?:**

- **Social and practical implications are missing**

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“With respect to the implications, at theoretical level, the study provides evidence with respect to the strong synergistic relationships presented by EFQM-EM and KM. At the level of the strategy and general policy of an organization, we have identified numerous similarities in the directives established in both management approaches. In the most operational sphere, RADAR logic and the essential drivers of excellence (learning, creativity and innovation) are essential elements for the success of KM.

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6. Quality of Communication: Does the paper clearly express its case, measured against the technical language of the field and the expected knowledge of the journal's readership? Has attention been paid to the clarity of expression and readability, such as sentence structure, jargon use, acronyms, etc.:

- **Proofreading is required.**

We have sent the paper to a professional copyeditor in order to improve the English of the paper.