THE MYTH OF TQM IN KNOWLEDGE MANAGEMENT SYSTEMS

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Abstract

The paper endeavours to debate the myth of total quality management (TQM) in knowledge management systems (KMS), i.e., the authors will demonstrate that KMS have not achieved total quality. The reasons for this claim are: (i) organisational knowledge management (OKM) (stricto sensu) comprises a blend between individual and collective sense making; (ii) their dialectic process raises ethical and social issues despite the context (more or less technological); (iii) quality is an ambiguous and subjective concept; and, (iv) total quality management is a philosophy of management (potential multiple interpretations). Through several empirical evidences from the first co-author PhD work and professional experiences, a novel framework will be proposed. Finally, this contribution argument will be divided into 5 sections: (i) the hierarchy of DIKW; (ii) knowledge management; (iii) total quality management; (iv) KMS versus TQM; and, (v) discussion.

1 Introduction

Knowledge management (KM) is a widely debated topic in literature; although, some of its gray areas have been neglected (e.g., Costa, Rogerson & Wilford, in press). This paper debates one of its gray areas: if it is possible to achieve total quality management (TQM) in KM systems (KMS)? In spite of potential criticism the authors declare their belief, i.e., TQM in KM is a myth!

KM identifies a set of organisational policies or communitarian initiatives which endeavour to discover, collect, preserve, change and share knowledge in order to add value (economically, socially, culturally, etc.) (Costa, 2011). And, TQM is a management philosophy devoted to improve organisational overall effectiveness and performance (Pankaj, Naman, Kunal, 2013).

The interface between these concepts is the "heart and soul" of this manuscript; since, hitherto, KMS assessment models postulate a plethora of myths about TQM in KM. Thus, through several empirical evidences from the first co-author PhD and professional experiences a novel framework will be proposed. To conclude, the argument will be divided in 5 sections: (i) the hierarchy of DIKW (data/information/knowledge/wisdom) (ii) KM; (iii) TQM; (iv) KMS versus TQM; and, (v) discussion.

2 The hierarchy of Data/Information/Knowledge/Wisdom

Górniak-Kocikowska (2011) argues that KM comprises two analytical dimensions: information and knowledge. While information is characterised by some level of

abstraction, cluster of requirements and desiderata orientating a theory (Floridi, 2013), as well as it is a polymorphic experience and a polysemantic conceptualisation (Beijer, 2009); knowledge is an individual or communitarian fluid process in order to promote contextual homeostasis through identity, sentience and willingness (Costa, 2011).

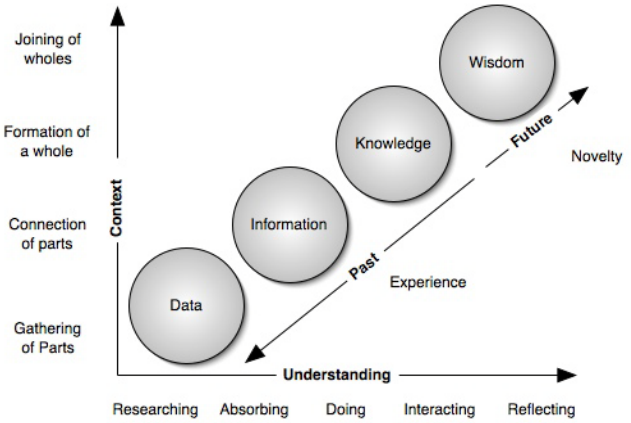

Figure 1. The DIKW pyramid (Source: Clark, 2012)

Yet, the DIKW pyramid reminds how extremely thorny is to detach both concepts from their basis (data) and contextual environment (figure 1). Data is a bundle of signs or facts which are unorganised and unprocessed (lack of context and interpretation) (Choo, 2006); and, the environmental context symbolises the organisational (parts versus whole) and personal background (research to reflection) (Clark, 2012).

That is why semantics and philosophy play a decisive role in today's environmental context; even so, contrarily to Floridi (2010), the authors believe that knowledge social meaning requires a unlike approach due to the dialectic process between personal and organisational *ba*. The answer lies on wisdom, i.e., knowledge maturity throughout time or personal/communitarian development (Rowley, 2006).

3 Knowledge management

3.1 Overview

KM identifies a set of organisational policies or communitarian initiatives which endeavour to discover, collect, preserve, change and share knowledge in order to add value (economically, socially, culturally, etc.) (Costa, 2011). The underlying reasons that justify the authors option are: (i) the impact of technology, namely digital, pushes forward novel structures (e.g., virtual communities) which characteristics cross over a traditional definition of "organisation" (Sinclair, 2008); (ii) "community", can involve a group of individuals with diverse characteristics that might share socio-cultural roots or values and interact within a certain context (MacQueen *et al.*, 2001); (iii) knowledge produces more than economic value (e.g., McKinsey Global Institute, 2012)!

3.2 Levels

KM in a *stricto sensu* encompasses a blend among individual and collective sense making. Therefore, it is essential to debate personal knowledge management (PKM) and

organisational KM (OKM). PKM "is a set of processes, individually constructed, to help each of us make sense of our world, and work more effectively" (Hart, 2013); or, a bottom-up approach for the needs of knowledge workers (Pollard, 2008). And, OKM is "a process or performance to create, acquire, share and apply knowledge which leads into learning increase and performance improvement" (Armstrong, 2012, pp. 22); or, procedures that endeavour to facilitate the total creation and flow of knowledge within an organisational setting (Blair, 2008). Summing up, the continuous dialectic process between individual and collective levels raises ethical and social issues (e.g., privacy, dignity, intellectual property, etc.) despite the context (more or less technological).

3.3 The role of technology

KMS are technologies devoted to KM support (creation, acquisition, sharing and appliance) within organisational contexts, and widely recognised as a key remark for competitiveness (Frost, 2013). This short definition exhibits the lack of agreement in literature about the concept and its boundaries, since it depends on (Firestone, 2008): (i) the approach to knowledge; (ii) the KM initiative; and, (iii) system architecture.

The authors follow the polarised view of Sezgin & Saatçiouğlu (2009), because it aggregates: (i) McElroy's (2002) interpretation (knowledge as a process); (ii) the evolutionary analysis through capabilities, adoption and management philosophy (Rezgui, Hopfe & Vorakulpipat, 2010); (iii) architectural option (Delic & Riley, 2009).

And despite consensus over KMS critical success factors, i.e., leadership, organisational culture/context, ICT infrastructure, and training (Al-Ghmad, 2013); the reality is that recent studies on KM initiatives acknowledge contradictory outcomes. For instance, Ragsdale (2013) concludes that: (i) 93% of US service organisations embraced a KM initiative through technology when compared with 81% in 2000; although, (ii) the majority of managers were not fully aware of KM tools, i.e., which were "little KM" (personal) and "big KM" tools (collective- content management); (iii) a large percentage (over 70%) acknowledged "big KM" tools as an multifaceted technology for indexing content, add layers to metadata, enable contextual data to workers/customers and provide useful information (response to everything); and, (iv) 72% illustrated a preference for a technology-centered initiative instead of a person-centered one.

Or, Tow, Venable & Dell (2012) demonstrate that: (i) KM responsibilities within an initiative enable a managerial or intermediate position inside the organisational context; (ii) and, often (above 65%) managers do not realise the importance of context over technology and knowledge identification; (iii) most likely is that "knowledge nodules" (key workers) are not identified or context constraints knowledge sharing.

4 Total quality management

4.1 Overview

TQM is a management philosophy devoted to improve organisational overall effectiveness and performance. For that, some considerations are important (Pankaj, Naman, Kunal, 2013, pp. 40):

> (i) entails a set of techniques and procedures used to reduce or eliminate variation from a production process or service-delivery system in order to improve efficiency, reliability, and quality; (ii) TQM is an integrative philosophy

of management for continuous product and process improvement to achieve customer satisfaction; (iii) companies should not look at TQM as a static set of recommendations.

The major difference between a conventional approach to quality and TQM is the word "total", which intrinsically attempts to flat any defects or flaws in the final product/service. Hence, TQM features include (Leopoulos & Chatzistelios, 2014): (i) control/monitoring over the process; (ii) institutionalise measurable quality through a comparison between aims and outcomes; (iii) workers attitudes should promote quality objectives through a total commitment with and by managers; (iv) quality as a total priority for the organisation (transversal process).

From the above considerations an ambiguous and complex idea within TQM emerges: quality! The significance of each dimension in quality can change because consumers' or users preferences are mutable, i.e., is not an absolute measure (appraiser's perspective); and, any quality measure should be subjective in order to promptly assess individuals' opinions. This assumption is embedded in today's business environment throughout several assessment subsystems (Ruževičius, 2006): (i) economic efficiency, namely organisational resources allocation and environmental footprint; and, (ii) socially, which illustrates a company relationship with society.

4.2 Traditional total quality management frameworks

The standard ISO 9000 history acknowledges a successful conversion of military safety rules to corporative contexts. Presently, any company can choose a certification over 19.500 standards, although the initial one (ISO 9000) has five major sections: (i) requirements; (ii) management responsibility; (iii) resource management; (iv) product/service realisation; (v) measurement, analysis and improvement (ISO, n.d.).

In 1987 the US Congress approved the Malcolm Baldrige National Quality Improvement Act, which established an annual quality award for US companies. Its aim was to encourage American corporations to improve quality, customer satisfaction, and overall organisational performance. This framework can be applied to current quality management practices, benchmarking performance and world-class standards, as well as to improve the relationships between suppliers and customers (NIST, 2014).

The European Quality Award was officially launched in 1991 and, its primary intention was to sustain, persuade and identify the development of effective TQM by European organisations. This theoretical framework implies two key components: (i) enablers, which are leadership, people management, strategy, resources and processes. These features have a guidance purpose regarding the conversion of inputs into outputs; and, (ii) results, which can be defined through people satisfaction, customer satisfaction, impact on society and business results. In addition, the award defines nine primary areas, which are further divided into secondary areas (EFQM, 2014).

5 Knowledge management systems versus total quality management

5.1 Overview

Similarly to KMS, TQM critical factors include leadership, organisational culture and training (Walsh, Hughes & Maddox, 2002). However their focus is dissimilar, i.e., while

TQM implies an improvement based on facts KM is based on building a culture of knowledge sharing. The philosophical practice of TQM is to comprehend and discern enhanced processes, while KM focuses on the imaginary or acknowledged tasks that people are undertaking (Prajogo & Sohhal, 2006).

To integrate TQM in KM activities requires an effective KMS development and implementation; although, it is really possible to achieve total quality in KMS? The answer relies on information systems (IS) literature, which explores knowledge maturity models. In a generic sense, maturity models encompass (Weerdmeester, Pocaterra & Hefke, 2003): (i) the development of a single entity is simplified and described with a limited number of maturity levels; (ii) levels are characterised by certain requirements; (iii) levels are ordered sequentially; (iv) during development, the entity progresses forward from one level to the next without omit them.

5.2 Assessment frameworks

The Capability Maturity Model (CMM) is an oriented model for determining software process maturity within an organisational context through a systematic process. Basically explores how to achieve processes control during software development or maintenance, as well as how to evolve a culture of software engineering. CMM is a normative model with five levels of maturity, and each level is described by a unique set of features. Apart from level 1, several different key process areas (KPA) are identified at each maturity level (Feng, 2006).

The Knowledge Management Maturity Model (KMMM) acknowledges multiple versions, as for instance Siemens' KMMM or Paulzen & Perc's model. These conceptual frameworks are based on the CMM, i.e., explore KM maturity through five stages. Although, each version identifies a set of features for each stage according to the environmental context (Teah, Pee and Kankanhalli, 2006).

Freyle, Rincón & Flórez (2012) describe the Quality Maturity Analysis (QMA) as a tool for assessing the strengths and weaknesses of organisational quality and its impact over the KM process. Its procedural actions depend on the organisational structure and taxonomy, as well as, a good time to undertake it is prior to any selection process regarding a quality system.

Hitherto, evaluation models postulate some KMS myths (Pawlowski & Bick, 2012): (i) these can deliver the right information and to the interested parties; (ii) these can store tacit knowledge or intelligence; (iii) these can share or multiply human intelligence; (iv) these enable organisational learning.

6 Discussion

6.1 A plethora of myths

The disclaim act for this section acknowledges the first co-author PhD work and professional experiences versus KMS literature. This interaction will allow to deconstruct KMS myths, as well as to promote basic assumptions for the conceptual framework (observe table 1). After that, the authors provide additional information for each interaction (clarification procedure). Two final notes are: (i) for further details on the first co-author PhD research read Costa, Rogerson & Wilford (in press), Costa (2011), or Costa, Prior & Rogerson (2010); and, (ii) his professional background

denotes his experiences as a consultant in Management/ICT in Small Medium Enterprises in several business areas, as for instance mould industry, logistics, etc.

Table 1. Author Experiences vs. Literature

MS Myth (Literature)	Author		Justification	Assumption
	PhD	Experiences		
Deliver the right information	Rarely	Rarely	Data type (sign, fact or image); knowledge vs. content	Knowledge *corpus*; personal vs. collective interpretation
Contextual environment	Rarely	Rarely	Physical, socio-cultural, and political environment	Collective vs. individual *ba*
Culture of knowledge sharing	Extremely difficult	Extremely difficult	Organisational structure and individual decision making	Ethical and social issues (organisation vs. worker)
ICT infrastructure (strategy, adoption, understanding)	-	Extremely difficult	"little KM" vs. "big KM"; organisational ICT strategy	Knowledge flow and network (*know-nots*)
KM maturity	Difficult	Extremely difficult	*techne* vs. people-centred	Knowledge ecosystem (no rejection)
Store tacit knowledge	Rarely/Never	Rarely/Never	Knowledge as a process (*sine qua non* condition)	Context
Enable organisational learning	Rarely	Never	Organisational vs. individual learning	Perceived benefit

6.1.1 Myth 1: Deliver the right information

Deliver the right information rarely occurs due to data structure (sign, fact or image), since individuals understanding/thinking is unlike. As Parkinson (2012) describes "images (...) go directly into long-term memory where they are indelibly etched. Therefore, it is not surprising that it is much easier to show a circle than describe it". This individual interpretation enables a unique knowledge representation while content end goals are for a collective audience (sense making) (Costa & Silva, 2010); so, it may not satisfy an individual requisite. That is why a polarised view of a KM initiative is vital! An illustrative example is when a Key Account Manager (KAM) considers content from technical services to much descriptive. As a result, he creates its own personal interpretation through data imagery to minimise the practical impossibility of excessive written content and information delivery.

6.1.2 Myth 2: Contextual environment

Ba acknowledges the interaction among several spheres of influence (physical, socio-cultural and political) regarding an organisation or an individual (Murata, 2011). While the physical sphere embraces the organisational spaces layout (e.g., offices, open spaces, industry), the bond with organisational culture reflects the socio-cultural sphere; and, finally, the power/level of influence (the political one).

Assuming the bioholonic argument about *ba* (Murata, 2011), the authors argue that: (i) in a traditional contextual environment the physical and socio-cultural spheres are more prominent; (ii) in less conventional organisations (e.g., virtual communities) the political sphere is stronger; (iii) in collective cultures the bioholonic argument is more denoted than in individualistic ones (social unit). A key example is the influence of spatial layout over *ba*, i.e., in an industrial facility (cast) the "physicality" is more intense than an ICT company; because, the procedural flow enables people interaction through visual contact and oral communication in spite of the ICT existing infrastructure.

6.1.2 Myth 2: Culture of knowledge sharing

The blend of information delivery and contextual environment illustrates why is so difficult to achieve knowledge sharing. Only through personal or communitarian maturity (wisdom) (Rowley, 2006), it will be possible to minimise the ethical and social quandaries and create a culture of knowledge sharing; since, individual decision making is influenced and influences the organisational structure (e.g., Costa, Rogerson & Wilford, in press). For instance, a KAM influence over other team members; a manager short-sightedness regarding personal experiences intellectual property; or, how the physical layout constraints or helps such sharing.

6.1.4 Myth 4: ICT infrastructure

Managers' unawareness about "little" or "big" KM tools constraints the ICT infrastructure, as well as its adoption (Ragsdale, 2013). Why? This lack of knowledge promotes a strategy based on the overall sense of a KMS, i.e., multifaceted technology to index content within data warehouses, add layers to metadata, enable contextual data to workers/customers and provide useful information through filters. Hence, the knowledge flow is compromised since the *know-nots* typically do not engage (create or share) within the network. This lack of adoption recognises the KMS collective option strategic choice over "little KM" tools due to managers lack of perception. An interesting example comes from the mould industry (company x), in which the knowledge flow through the KMS infrastructure reports only technical or production errors (similar to an ERP). Moreover, the knowledge network is completely informal (tacit) and the *know-nots* just interact after listening other workers insights.

6.1.5 Myth 5: KM maturity

The maturity of a KM initiative encompasses two analytical dimensions: (i) the KMS generation; and, (ii) the maturity of its components. When managers do not realise the significance of context over technology and knowledge recognition, a KMS can be categorised as first generation (e.g., Executive Information System); contrarily, when "little" KM tools are enabled within the initiative, it is a second generation KMS (Firestone, 2008). This claim denotes an organisational trade-off: KMS generation versus knowledge ecosystem. A first generation KMS is *techne*-centred, so the

knowledge ecosystem is constrained; while a second generation promotes a people-centred view.

In theory, no rejection occurs within the knowledge ecosystem when an organisation explores a second generation KMS; although, bearing in mind Weerdmeester, Pocaterra & Hefke (2003), the development process requires certain obligatory issues throughout sequential levels. And the requirement for PKM tools entails an individual self-construct process; so, the faultless logic of sequential steps may not occur. An example is provided by a KAM that develops its own "little" KM tools through a "chaotic creative process", and systemically has better commercial results.

6.1.6 Myths 6 and 7: Store tacit knowledge and enable organisational learning

Knowledge as a process is a *sine qua non* condition for tacit knowledge to be minimally stored. Minimally, because even in an ethical organisation, a KMS will not store the bulk of tacit knowledge (individual decision); and, organisational learning invokes the perceived benefit of workers about the knowledge *corpus* (Pawlowski & Bick, 2012).

6.1.7 Myths summary

A total quality KM approach must be built on four levels of argument (Laundon & Laudon, 2011): (i) strategic, debates the KMS initiative strategy, maturity and how the contextual environment may influence both; (ii) management, it is organised around the KM repository, knowledge *corpus* and, leading change; (iii) knowledge, expresses a polarised view for knowledge as a process. These reasons encompass ethical, social and knowledge representation issues; (iv) operational, organisational technological "building-blocks" and actions that pledge strategic objectives and tactical approaches.

In spite of the prior explanations, extra remarks on management and knowledge levels are vital! The KM repository denotes a set of KM actions through several queries (Firestone, 2008): (i) what are the critical knowledge domains to an effective organisational effort? (ii) how it is characterised the knowledge network (knowledge flow importance)? (iii) who are the *know-nots*? A well-established knowledge *corpus* requires a critical criterion, i.e., an ethical organisational climate; however, it is an extremely complex process (Costa, 2011). Leading change in a KM initiative means a successful achievement on the prior dimensions, since an ethical organisational climate enables mobilisation through consensus (departmental/hierarchical) (Firestone, 2008).

The knowledge level encompasses the organisational knowledge flow (creation, acquisition and sharing). Thus, managers need to recognise: (i) PKM influence/weight over OKM (Ragsdale, 2013); (ii) how extent the ethical and social dilemmas limit the KM initiative (Costa, 2011); (iii) that "little" KM tools are most important (Firestone, 2008); (iv) that knowledge creation/representation requires ambiguity, open interpretation and may involve images, language, voice (Costa & Silva, 2010). A disproportionate attempt to categorise it (structured control) restricts a polarised view; (vi) technologies cannot resolve the knowledge sharing issue (Frost, 2013); (vii) knowledge acquisition is time consuming and its return hard to estimate (Costa, 2011).

6.2 Challenging the myths- A conceptual framework

After debating KMS myths the authors illustrate a novel conceptual framework (figure 2); although, similarly to Laudon & Laudon (2011), four levels are considered: strategic, management, knowledge and, operational.

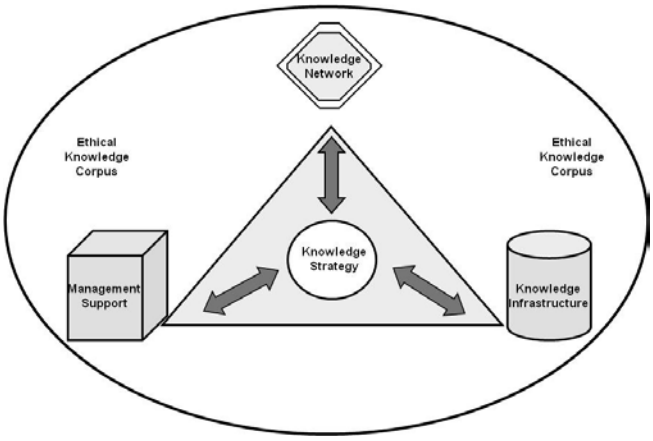

Figure 2. Level 1 (Source: Author)

However, it is essential to comprehend the model interactions and each component. The knowledge network has an important role on KMS total quality, because organisational knowledge development is bounded to its flow. In this case, knowledge is categorised in four broad nomenclatures: (i) human, enclosed in workers minds; (ii) mechanised, required to carry out a precise task which has been embedded into technology; (iii) documented, organisational sources (content); (iv) automated, stored throughout "little" and "big" KM tools.

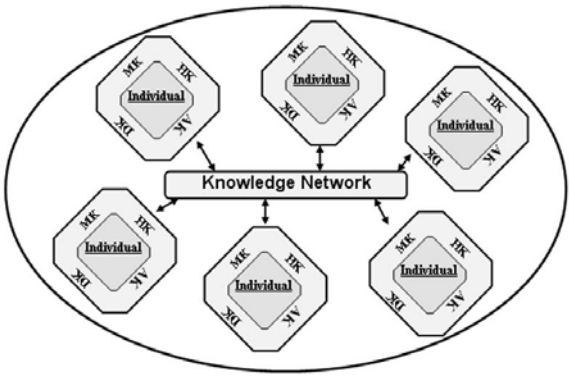

Figure 3. Level 2 (Source: Author)

PKM is the core within the knowledge network in spite of some criticism, i.e., an individual does not possess all the entire mechanised, documented or automated knowledge organisational knowledge. However, the widespread of technologies may induce access to it. This design exhibits the importance of people in a KM initiative and minimises some myths of TQM in KMS.

The knowledge infrastructure enables multiple knowledge conversions before categorisation (database), because it allows users feedback to all ideas (image, text or voice). Each input insertion becomes available on layer 1 ("democratic layer"), i.e., all organisational members may assess such input (potential uses for workflow or products) through a series of criteria. After these comments, if usefulness is recognised goes to layer 2, or in case of "rejection" continues to flow in an intermediate and transversal repository (ITR). Although, periodically, these inputs are reinserted in layer 1 for a novel democratic process; and, when users access the ITR the prior evaluations are not visible (avoid users bias).

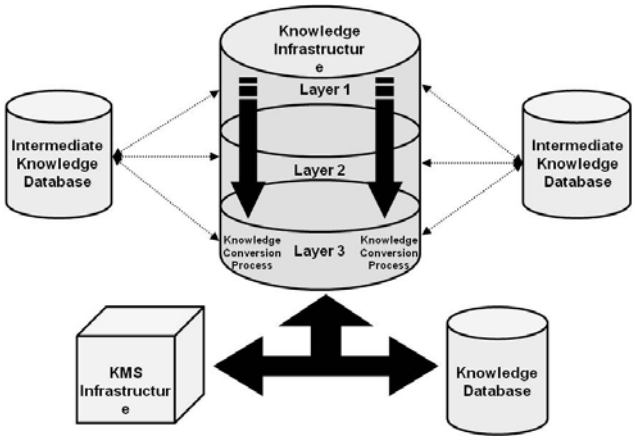

Figure 4. Level 3 (Source: Author)

In layer 2 the outcome is "practical learning", since the knowledge network is "encouraged" to explore the ideas in a practical sense (individual or even collective-departmental for instance). The following step is to debate people experiences in informal conversations and reassessed again by the knowledge network (similar to the Delphi method). Similar to layer 1, in case of satisfactory outcomes the input moves forward to layer 3; and, unsatisfactory acknowledges the ITR. Note that people experiences will be available!

Layer 3, "recognition", the selected ideas/experiences are matched against the KM initiative strategy. The chosen input is polarised according to procedural comments and shared across the organisation (workflow- knowledge database). The unselected ideas/experiences are inserted into the ITR; however, workers can remark managers' decision. This enables a participatory and open environment that is a key characteristic of a knowledge sharing culture.

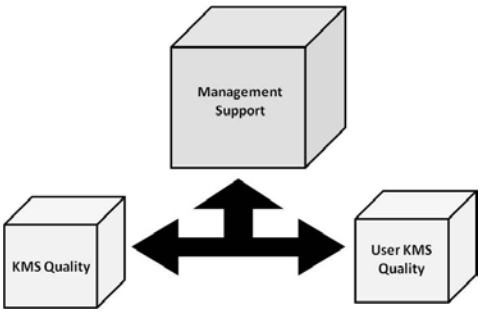

Figure 5. Level 4 (Author)

Note that a KMS infrastructure involves hard and soft elements. The use/user satisfaction specifies the authentic levels of KMS usage, as well as users' satisfaction; however, the perceived benefit acknowledges a blend of measures about the knowledge conversion process. Both analyses denote the organisational knowledge flow quality.

7 Conclusions

Despite the importance of TQM for business competitiveness its philosophical assumptions are unlike from of a KM initiative. Although, literature focuses its attention on technological solutions, KMS development maturity or, how to successfully

implement them; and, neglects the interaction between social, cultural and ethical organisational issues (future analysis). The proposed framework aims to retort such challenges; however, TQM in KMS continues to be a myth!

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