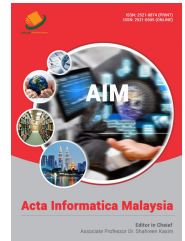




ISSN: 2521-0874 (Print)  
ISSN: 2521-0505 (online)  
CODEN : AIMCCO

## Acta Information Malaysia (AIM)

DOI : <http://doi.org/10.26480/aim.02.2018.04.09>



# TOWARDS THE INTEGRATION OF QUALITY MANAGEMENT SYSTEMS AND KNOWLEDGE MANAGEMENT SYSTEM IN HIGHER EDUCATION INSTITUTION: DEVELOPMENT OF Q-EDGE KMS MODEL

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### ARTICLE DETAILS

#### Article History:

Received 7 November 2017  
Accepted 10 December 2017  
Available online 5 January 2018

### ABSTRACT

Quality management system (QMS) and knowledge management system (KMS) are two management discipline that are widely used in organizations. The implementation and adoption of QMS is a continuous effort that helps organizations to improve their quality and performance. If adoption of QMS to improve organization's quality, the purpose of KMS implementation in organization on the other hand as a platform and tools to support the management of knowledge activities. In view of the massive activities of knowledge creation, knowledge sharing and repository of knowledge within higher education institution (HEI), the use of KMS will provide greater benefits to stakeholders within HEIs. Past studies have shown that both management disciplines (QMS and KMS) have positive impact towards organizations in term of costs reduction, work performance and business continuity. HEI are also facing with challenges and obstacles because of the growing demand like any other organization. Some of the major challenges faced by HEI such as rising costs of tuition fees, growing number of competition among colleges and universities and introduction of new learning methods and technologies. The purpose of this study is to conceptually explore and identify the needs and potential integration between QMS and KMS within HEI. Based on the discussion and findings, this research provides future direction for more research on two-management disciplines.

### KEYWORDS

Integration, quality management system, knowledge management system, higher education institution, organization performance.

## 1. INTRODUCTION

HEIs are institutions that provides learning and education at the higher level or tertiary level. In Malaysia, HEI are categorized into public HEIs (university, polytechnic, community college and technical training institute) and private HEIs (university, foreign branch campus, university colleges and colleges) [1]. Since there is compounding demand to higher quality of education and program, the competition level among HEIs are becoming stiffed. Based on the statistics figure, the number of private HEIs (PHEIs) in Malaysia itself contributes to the highest number with 495 institutes [2]. Apart from the huge number of institute offering tertiary education, there are other challenges faced by HEIs as well such as initiatives of sustainability in teaching and learning, research and development, administration services and community activities could assist HEIs in seeking for funding, minimizing costs, promoting effective management and meeting challenges in societies [3]. As a result, managing and handling all these challenges are crucial to sustain the quality and performance of HEIs.

Referring to the example of Australia, one of the popular countries in offering higher education shows that there is a clear indicator the quality of educational experience is declining; as shown in Bradley report published in 2008 [4]. In fact, many HEIs faces reduction in student registration due to stiff competition. Therefore, there is a need to highlight the problem of the programs quality and services offered [5]. In contrast, quality improvement will result to another higher competition for HEIs on top of increasing demand from job

market, changes in approach and acquisition of new skills are some of the list of mechanisms required in addressing the quality issues and the needs for implementing QMS within HEIs [5-8]. The history of QMS implementation started in the mid-1990s with the adoption of ISO standard in Europe, United States of America (USA) and Australia; Malcom Baldrige National Quality Award (MBNQA) in the USA, Deming Prize in Japan and European Quality Award in European countries [9].

HEIs are consistent with the pursuit and development of knowledge activities. Learning in the classroom, embarking on research activities and venturing into collaboration and cooperation with other entities are among of the activities that produces knowledge. Knowledge activities in HEI are classified into two categories that are academic knowledge and organizational knowledge [10]. Academic knowledge is the pool of information/knowledge as an outcome of academic activities; meanwhile organizational knowledge related to the strategies/strategic direction set by HEI. and affirmed that there is a link between pools of academic knowledge and organizational knowledge [10,11]. Although HEI is an institution focuses heavily on academic excellence or known as learning organization, however, HEI also functioning as an organization that has its own vision, mission and business strategies as well. In fact, to some extent, students are regarded as one of the major stakeholder within the 'business' of HEI. On a similar note, HEI nowadays are considered as a marketplace and education program provides by HEI is a marketable service [12].

Since there are requirements for regular adjustment to ensure organizations' are achieving objective by conducting constant

improvement process, utilization of quality tools within HEI should be broadened [13,14]. In line with the understanding on the relation between quality tools and knowledge activities, concludes that adequate knowledge (that is generated in company, source of knowledge and the one that transfer out from organization) has impact on efficiency of QMS [15].

The above discussion postulates the needs for future study on the integration between quality and knowledge management tools within HEI in addressing their current and upcoming challenges. A researcher agrees that the integration between knowledge management (KM) and total quality management (TQM) and potential variables must be examined in future [16]. In fact, KM and TQM practices are used for improving the performance of many organizations [17,18]. Undeniably, HEIs are organization where knowledge activities are created, archived and reuse, meanwhile HEIs are also flexing their arms to provide quality services by achieving the vision and mission set by the organization. Since the outcome of KMS proven to be positively linked to the performance of organisation, this study suggested that there is great potential in exploring the integration of two management disciplines within HEI [19].

Despite positive discussions on the integration of quality tools and knowledge activities, A researcher tabulates the ability of QM implementation in improving the development of learning capabilities are still unclear [20]. This is mainly due to the nature of HEI itself that are dynamic and flexible in nature that contributes to the difficulties in imposing quality management in the institution. According to a researcher, other factors that may hinder the successful implementation of quality management in HEI such as resistance to change, insufficient administration commitment, high time investment due to personal training, difficulty in applying TQM tools to HEI environment, little experience of team leaders and staff in team work and concerns of HEI to have their own results [21]. However, this study argues that its crucial to further the investigation on the integration between QMS and KMS within HEI. Its due to the fact that there is lack of studies on integration between knowledge management system/model and QMS model.

In the past, studies on quality are either focusing on integration between KMS success model and EFQM as conducted by a researcher, document management system and ISO 9001:2008 or with other systems such as e-learning, but yet on the integration between QMS and KMS process especially within HEI [22-24]. This study will add to existing literature on KMS and QMS integration. Based on the study, one of the benefit of implementing KMS in organization such as e-learning has improved the teaching and learning quality [25]. However, further investigation is required especially in verifying the level of quality in organization. As discussed by another researcher, from the performance improvement perspective, there are ten rules of quality components that are leadership, customer support, innovative culture, involvement of employees, engagement and ownership, education and training, quality supply chain, environment, organizational factors, strengthening of quality issues and finally the teaching and learning approach [26].

## 2. QUALITY MANAGEMENT SYSTEM (QMS)

### 2.1 What is QMS

According to study, QMS is a set of procedures (records, instructions, and guidelines), policies (guidelines, objectives) and manual documentation to provide a framework in the operations of organization; to achieve customer requirements and engaging with continuous improvement of organization and consolidated approach for business in the implementation of quality management (QM) models, methods and tools to achieve the business objective [27,28]. In HEI, QM is the term used to explain processes involved to ensure properly maintained standards and to optimize quality of education [29]. Use of quality techniques, tools and implementing it within organization together with integration of QMS improving the performance of an organization [30,31].

Although there is confusion in the definition between TQM, QM and QMS, cited by a researcher argued that it is impossible to define one specific definition for TQM; therefore, the best solution is to agree on a set of principles that adopts TQM approaches [31]. Moreover, TQM term were not popular in the late 20th century and QMS term is used more nowadays [32]. However, a researcher suggests that the minimum requirements for the establishment of QMS and as a departing point to improve is by referring to International Standard Organization (ISO) guidelines [33].

Majority of HEIs in Malaysia adopts ISO 9000 guidelines to develop and improvise the quality of environment within the institution. However, according to one of the researcher, the most popular quality improvement tools in Greek companies, are TQM method and 14001 standards [29]. Based on a study, senior management and leadership, involvement of stakeholder, managing the culture change and establishment of quality processes are the four factors identified contributed to the effectiveness of QMS implementation in within information technology (IT) division of HEIs [34]. In some cases, HEIs adopts the use of other type of QMS such as Malaysian Standard (MS) 1900 [34].

The objectives of ISO 9001:2015 (new revision of 9001:2008) among others to provide guidelines for organization on leadership, planning, support, operations, performance evaluation and improvement [35]. In the ISO document description, function of the document is to provide general guideline for organization in improving the quality of the organization based on the set objective, mission and vision. Even though it only provides general guidelines to organization, HEIs that has implemented QMS (based on ISO 9001) proven to be credible (from the perspectives of their customers), well-organized and reputable [8,36]. The use of QMS based on ISO standards are also widely used such as in South Africa and Greek. Based on a study, in Greek companies shows that 67 out of 146 companies from the study had implemented ISO guidelines for their QMS initiatives, while remaining of the companies are either has implemented other QMS or at least utilize one of the many quality tools [30]. On the same notes, ISO implementation in South Africa are among several models of QMS used in education and training. Table 1 below shows the list of QMS Model listed by South African Qualifications Authority (SAQA). Based on the list of QMS model, ISO 9000 found to be one of the lists of QMS used in the country within education and training.

**Table 1:** Quality Management System Model [37]

No	Model	Significance to Education and Training
1	Malcom Bridge National Quality Award	Used successfully in education and health sectors in USA
2	European Quality Management Award	Focuses on self-assessment. Self-assessment in quality.
3	Australian Quality Award	Focuses on self-assessment.
4	The Koalaty Kid Program	Identify specific targets for improvement and work towards the targets.
5	The Deming Prize	Modified Deming Points in Education – Mt Edgcombe High School
6	ISO 9000/2000 Quality Management Code of Practice	Focusing more on customer expectations and to achieve the targeted performance.
7	Investors in People	Assist organization to achieve performance through planned approach
8	The South African Excellence Model	Longer term improvement plan
9	The Balanced Business Scorecard	Allows admin to monitor the execution of strategic planning and improvement
10	The Scottish Quality Management System	Similar requirements with South African Qualifications Authority

### 2.2 Implementation of QMS Within HEIs

Continuous use of quality improvement tools initiatives is looking at its efficiencies in improving organizations. In the case of QMS implementation, quality improvement process initiated by organization is to sustain their performance and existence. The process of acquiring and certifying company to a quality standard is not a simple and easy task. According to a researcher, although many organizations has implemented QMS in organization, however, challenges of quality improvement does not only occur in achieving it but to sustain and keep on improving it [13,38]. Recent ISO survey also shows that the number of ISO9001 certificates issued in Malaysia in year 2016 (10,380) declined than the number of certificates issued in year 2015 (11,963 certificates). It also supported by that 2,461 certifications awarded between 2006 and 2011 were withdrawn [39].

In ensuring the success implementation of QMS within HEIs, this study argues that the organization shall understand and highlight the area that they would like to focus on. The business of universities relies on services such as teaching and learning, academic research, social responsibilities and others. In the case of Universiti Utara Malaysia (UUM), that has implemented ISO 9000 since year 2001, QMS implementation has been regarded as strategic approach that require support from senior management, moral, emotional support and higher

commitment from all employees [37]. These factors determine their success in the QMS implementation ever since [28]. On top of that, a researcher suggested that the critical success factors for QMS implementation within HEIs includes effective communication, process-based organization, conducive environment in supporting continuous improvement, committed and dedicated employees, leader and higher management [40]. Identification of domain areas within HEIs are essential as the whole structure of HEI itself are broad. By referring to a study by a group of researchers, past studies conducted in HEIs usually focusing on four major QM topics [41,42]. The four topics highlighted by the study such as QM implementation issues, QM models, QM techniques & tools and QM dimensions. In fact, the most highly cited of QM dimensions such as people management, information and analysis, management of processes, stakeholder, leadership and planning stage. However, although there are studies conducted on QM models among HEIs, however there was still no studies conducted or agreed on the best QM models for HEIs [42]. A researcher also highlighted five major areas of gap studies of QM in HEI: studies on gauging feedback (from academic and non-academics staffs), QM dimensions' validity and reliability, students' learning quality, impact of quality action measurement on staffs, investigation of several items of QM dimensions' implementation within HEI and regional studies [42].

### 2.3 QMS Process and Components Used Within HEI

A researcher has provided leading study and methodology for all universities wishes to implement QMS [8]. The study outlined 11 QMS process as a guide for HEI in implementing QMS as shown in Table 2 below. Based on the suggested list, the QMS implementation process does involve all stakeholders within organization from the lower level (employees) up to the higher level (all higher management levels).

**Table 2:** QMS Implementation Process [8]

List of QMS implementation process	
1. Highest management decision	7. Process definition exercise
2. Establishment of Quality Representative	8. Preparation of documentation
3. Establishment of working teams	9. Internal auditors training
4. Preliminary audit	10. Implementation of the system
5. Detailed implementation plans	11. Certification audit
6. Employee Training (for higher management & staffs).	

QMS study within HEI shall account areas for evaluation such as, organization and quality management, teaching and learning, research and studies, human resources, strategy students, infrastructure, financing, cooperation and openness of higher education institutions to the surrounding environment and the world at large [43]. While a researcher determined that the six factors influences the MS 1900 adoption within HEIs in Malaysia are culture of institution, leadership and management style, effective communication, involvement of all employees, commitment by higher level of management and the reward system in contra argues that management concept must be authorized, theorized, higher productivity, prolonged progressive mind, harmonized, dramatized and individualized needs to be in place before adapting it within organization [9,35,36]. In addition to the argument, there are number of similarities between researchers confirming the importance of knowledge quality elements in the implementation of management theory such as KMS and QMS [10, 38]. As highlighted by one of the researcher, since the implementation of QMS involve internal assessment and the needs of self- evaluation, therefore self-efficacy knowledge requirements is also needed [30,39]. This phrase accompanied the justification of this study in bringing along the effort of coining between QMS and KMS within HEI.

### 3. KNOWLEDGE MANAGEMENT SYSTEM (KMS)

Facilitation of knowledge management (KM) in organization typically associated with the establishment of information technology (IT) systems as an enabler - known as knowledge management system (KMS). According to a researcher, the purpose of developing KMS is to manage organization knowledge activities, creating knowledge networks, corporate directories and sharing of best practices [44, 45]. The objective is not only to assist organization in managing their knowledge, but also to reduce organizations costs [46,47]. Based on a study, KMS implementation within HEI contribute very significant roles in view of the nature of the organization itself that stands on four major thrusts that are research and development, teaching and learning, administration and services and community services [11].

### 3.1 Issues and challenges of KMS Implementation

In the past, studies have shown that the issues and challenges of KMS implementation does not only relies on identifying its systems or structural needs but also on the other factors such as acceptance by organization, users and the benefits of the system itself. Several theories and models have been developed earlier to measure the success of KMS such as the most widely and popular KMS success model by, re-specification of KMS model and Technology Acceptance Model (TAM) [10, 47]. Meanwhile, study by another researcher underlying the trend of KMS success study found that 26 empirical studies conducted between 2007 to 2011 on KMS success [48]. From this figure, nine studies conducted at organization and individual level while the remaining number conducted on individual level only. Although study by this researcher focusing on the structure of KMS success; not on investigating the factors or components of successful KMS implementation, nevertheless, this study contributes to further research on the structure and organization of KMS success [48]. From the previous KMS success model studied, ensuring the quality of system, content as well perceived benefit of the system and use of the system by the user are essential.

The above model developed aligned with the concern of KM and KMS issues raised by a researcher that categorized them into three categories which are information, management and technology [49]. One of the issues discussed were the readiness of 'clean data' before the implementation of KMS in organization. Given the fact, this study conducted in 1990's, but it gives a headlight for the consideration of KMS success that most of the model includes the content (information/knowledge) quality in the model. Based on study, there are 14 current issues on KMS that require attention and future opportunities for KMS researcher in particular [15]. The 14 issues based on study by defined into three categories in this study that depicts in the following Table 3 below.

**Table 3:** Categorization of KMS issues based on study by a group researcher [50]

NO	CATEGORIES	ISSUES
1	KMS Components and content	1. Evolving KMS capabilities and features 2. User lost critical knowledge 3. Security issue in KMS
2	KMS Implementation and adoption	1. Barrier issue to the implementation of KMS 2. Intention to use KMS 3. KMS as tools in getting the required information, (Retrieval knowledge / information mechanism). 4. Giving bad advice to user and influence of managerial actions 5. Dissemination and various of KMS technology used 6. KMS applied to social life areas, complex and dynamic environments 7. Investments and costs of KM Systems 8. How KMS support and improve Knowledge Management Process.
3	Integration of KMS with other disciplines, technology.	1. Big Data in Knowledge Management, (Creation, analytic, computing, tools, content). 2. Adoption to new technology for KMS 3. KM performance measurement

### 3.2 Factors of successful use of KMS

Several KMS success studies conducted earlier have discussed on the important component for ensuring the success adoption of the system within organization. KMS success study within educational organization by researchers, for instance addressed the external and internal components towards the success of KMS adoption [25, 51]. In detailed, a researcher divided both external and internal components into three success categories which are personal factors, system factors and environment factors [25]. Nonetheless, both studies have suggested that the success also depends on the existence of quality elements such as course/information quality, organization quality, system (output) quality. For instance, the widely used and discussed KMS success model by some researchers included the system and knowledge/information quality [10,47].

Another study by a researcher addressed the success factors of KMS more on external factors such as awareness of the system, efforts/ strategies and constraints to the current KMS [52]. This affirm the earlier study that the success adoption of KMS needs to include the elements of internal and external. Other factors such as the perceived benefit and use of the system also highlighted by several studies.

Since KMS is a platform used by organization to manage knowledge activities within system, the idea of KMS as a process model supported by a study as well. A researcher for instance proposed KMS as a process model that consists of three major parts that are the input element, process elements and the output [19]. In the output parts, three areas identified in the model which are customer's satisfaction, operational excellence and direction of the product itself. This study enlightened another KMS function that exceed the roles of mere information

technology (IT) platform. In reference to other study conducted by a researcher on 300 firms in Western Australia also suggested that the influencing factors for KMS perceived usefulness relies on individual, external, organizational and task complexity factors [53].

In principle, development of KMS shall comprises strategy, actors of the system, source of knowledge, systems interface delivery, functionality, continuous improvement [19,54]. As suggested by a researcher, continuous improvement needs to be done on KMS such as assessment of external environment, analysis of internal process, continuous trainings and audits [19,54]. The above discussion concludes the benefit and requirement of KMS ranging from the system benefit, usefulness and the needs to contain optimal content that this study referred as knowledge/information.

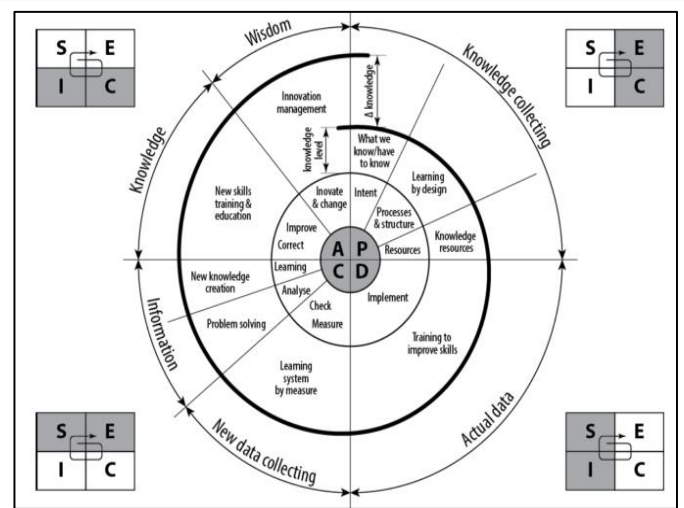
#### 4. INTEGRATING QMS WITH KMS

In the above discussion, orientation towards integrating between QMS and KMS are very positive. This study analyse components to be used in integrating QMS with KMS towards the development of Q-Edge KMS model. Based on a study, there are three basic QMS components (quality planning, quality control and quality assurance) to be used in integrating between KM and QM study [55]. This argument holds true as the purpose of integration of quality elements into KMS development is to ensure the utmost quality of knowledge activities. This idea supported by another researcher while developing integrated model between knowledge and quality [56]. According to the researcher, the roles of quality in the integrated model is to respond to stakeholder request while the role of knowledge in the model act as a repository; responding to the stakeholder request [57]. However, the difference between both are the integrated model by integrating the Deming PDCA (plan, do, check, act) cycle combined with Nonaka SECI (socialization, externalization, combination, internalization) model [57]. (Table 4 below shows the structure of integrated quality and KMS model and the summary of KMS components developed by several studies. The purpose of comparing the integrated model with KMS success model is to understand the functionality of KMS within the organization.

While highlighting the issues of post QMS implementation, a researcher emphasized on the importance of quality of knowledge, self-efficacy knowledge and process-based management effective [39]. This study gives the headlight to future study to understand the importance of integrating between quality and knowledge. In organization that stimulates knowledge activities, the development of KM platform in managing knowledge activities are also part of the processes. In fact, a researcher stands are that the higher management in organizations fundamentally agrees that between KM and QM; these two management discipline share the same objective which are to improve the integration between QMS and KMS [56]. Organization must also address three important quality challenges for the integration - quality must be the most important part of project planning and execution, roles and responsibilities for each individual must be clear, well htened another KMS function that exceed the roles of mere information communicated and accountable [56]. Although some researcher agrees that it is necessary to integrate KM tools in the Technical University – Sofia to ensure the success of KMS, however the study does not highlight on other elements of that are relevant to be integrated [58]. In a recent update, a researcher concurred that there is possible formulation of mutual effect between TQM and knowledge management [16].

**Table 4:** Comparison of System Components

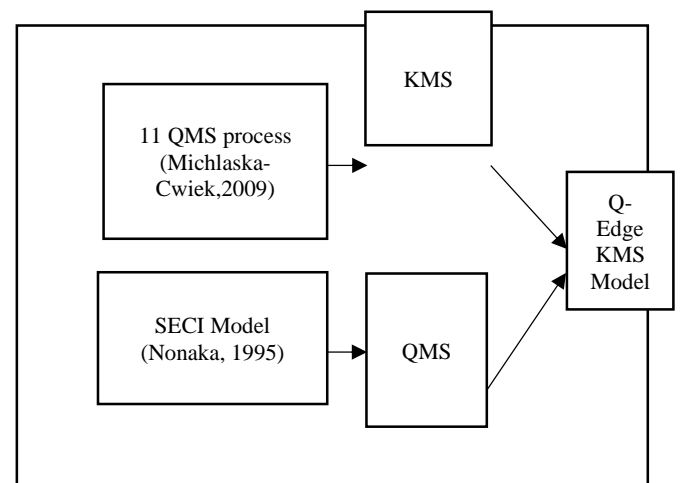
No	Principles of Integrated Quality and KMS model [57]	KMS Success Model Components	Author
1	Engineering, architect and thinking system	System Use	[10]
2	System understanding	Perceived KMS benefits, User satisfaction	[10], [48]
		Intention to use	[48]
3	Sustainable system	System quality	[10], [48]
		External environment assessment, improvement of critical internal process	[19]
4	Continuous learning system	Knowledge/information quality	[10], [48]
		Net benefits	[48]
		Continuous improvement	[55]
		External Training, audits	[19]



**Figure 1:** Quality and KMS Model - QKnMS [57]

Based on the above discussion, it shows that there are potential opportunities to study on the integration of QMS and KMS. Alongside with the potential, integration between QMS and KMS model matched the required the requirements of KMS success model components. For instance, earlier study by a researcher that re-specified the earlier KMS success model developed by the other researchers outlined five success elements of KMS implementation which are quality of system, the quality of knowledge/information, perceived benefit of KMS, satisfaction of user and use of KMS [10,48,59]. It is further strengthened again by other researcher that states the roles of QMS as the guiding elements for knowledge activities for KMS. The study agrees on the role of quality to manage the stakeholders meanwhile the purpose of knowledge is to provide sources to the system in managing the stakeholders [57,60,61]. Although study by provides clear direction for future studies in QM principles and disciplines, however, the study is still lacking in term of the in depth discussion on relevant components of QMS to HEIs [57].

#### 5. CONCEPTUAL FRAMEWORK



**Figure 2:** Proposed Conceptual Framework

This study outlines the conceptual framework towards the integration of QMS and KMS model as shown in Figure 2: Proposed Conceptual Framework above known as Q-Edge KMS model. Based on a study, QMS processes identified relevant to HEI in the past studies will be integrated with KMS process to develop the Q-Edge KMS model for HEI [60]. However, the above conceptual framework is still in the preliminary stage – therefore it still requires further in-depth studies or comprehensive review [62]. Nonetheless, this study provides a head-start for further exploration in the integration study between two management models that are still lacking especially for H

#### 6. MATERIALS AND METHOD

Past literature review was conducted for this study that are related to the efforts and activities in integrating between QMS and KMS especially within HEI. Several articles and literatures related to QMS and KMS were gone through. This research is structured into three major sections. The introduce the HEI environment and the development of QMS and KMS implementation within HEI [63]. The second section focuses on the discussion of QM and QMS implementation within HEI.

The third section discussed on the knowledge activities within HEI as well as the success factors of KMS installation. Finally, the fourth and the fifth section discusses on the potential integration between QMS and KMS [64]. Subsequently, the conceptual framework for this study is developed. Several databases used in this study in exploring for relevant articles such as Science Direct, Emerald and some articles retrieved from other source such as ResearchGate website. Google Scholar is used to extend the scope of searching for wider articles and databases. This study structured in such a way to investigate studies on KMS integration for future development of Q-Edge KMS model.

## 7. RESULTS AND CONCLUSION

Based on the above discussion and document review, this study concluded that there are potential and great opportunities in deepening study on the integration between QMS and KMS. Furthermore, such studies are still lacking on its existence based on the past review studies on QMS implementation within HEI. The above study also points out several findings based on the previous literature. Firstly, the integration of QMS and KMS shall look at QMS as the guiding framework in managing the process within KMS. Within HEI, majority of QMS implemented are ISO 9001, of which provides a direction for researcher to emphasize on the element of ISO 9001. Secondly, the integration also certifies the requirement of proper knowledge activities within HEI. Although the function of KM theory itself is to manage knowledge activities, however, the inclusion of QMS will further enhanced and provide credibility of the knowledge produced. Furthermore, if this is implemented within HEI, the quality of knowledge produced and used are highly integrity. Thirdly, this study strengthened the justification of opportunities to explore the integration between QMS and KMS. In the case of HEI itself, past studies have shown that most of the quality management study are mainly focusing on three areas such as modeling, implementation and issues related to the adoption of the model.

In a near future, this study will further concentrate on the development of Q-Edge KMS model by conducting more comprehensive literature review and empirical analysis. This research follows previous studies to confirm the benefit of two management systems towards the optimal organization performance through higher quality of services. The integration of QMS into the knowledge process within HEI shall look at the suitability of the QMS itself. Although majority of HEIs (especially in Malaysia) adopts the ISO 9001, but future study shall also consider the applicability of other QMS such as EFQM Excellence model and MBNQA. At this point of time, it is fair to acknowledge that while both QMS has its own objective to control process; its function in the KMS implementation is to support the systematic process of knowledge activities. This study also provides exposure to several studies that integrates and acknowledge the importance of QM in KMS and the advantage of KM in QMS – vice versa. For example, stated that QM adopts KM as one of its major components, while consideration of KM as key element in QM process improve the creation and utilization of knowledge within organization. Other potential areas can also be explored by the integration of QMS and KMS in supporting sustainability and service quality (SQ). discovered that one of the QMS framework (ISO 1400-based environment management system) proven to contribute to the transition of HEIs towards sustainable university initiatives. Since SQ in HEI are depicted mainly by the feedback from student's flexibility of the program and approachability of the institutes and also influenced by the top management direction it is the same domain that are benefited by the implementation of KMS within HEI.

In summary, roles of QMS is to ensure and secure the quality of process meanwhile KMS is the platform to execute and facilitate the process of managing knowledge in HEI. Both disciplines so far are discussed, reviewed and implemented separately in HEI, therefore the needs in exploring to investigate both disciplines for in upholding the HEI.

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