UNIVERSITI PUTRA MALAYSIA

DEVELOPMENT OF A CONCEPTUAL FRAMEWORK TO INTEGRATE QUALITY MANAGEMENT SYSTEM AND RISK MANAGEMENT SYSTEM

MAHMOUD ASAD SAMANI

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By

MAHMOUD ASAD SAMANI

Thesis Submitted to the School of Graduate Studies, Universiti Putra Malaysia, in Fulfilment of the Requirements for the Degree of Doctor of Philosophy

March 2016

DEDICATION

With utmost gratitude, I would like to dedicate this effect to the souls of my late Father and brother, to my dear Mom, my beloved spouse, Zohreh and to my lovely children, Maryam and Hossein

Abstract of thesis presented to the Senate of Universiti Putra Malaysia in fulfilment of the requirement for the Degree of Doctor of Philosophy

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March 2016

Chairman : Prof. Datin Napsiah binti Ismail, PhD
Faculty : Engineering

Proliferation in the number of Management Systems (MSs) necessary to manage an organization is an obvious fact and adopting an integration approach to deal with those MSs is an economic-wise manner. The need to create Integrated Management System (IMS) is the result of increase in the number of stakeholders and their respective Management System Standards (MSSs). The journal papers related to 06V¶ ntegration argue that in theory any two MSs or even more can potentially be integrated. In this research, it is shown that the attitudes and approaches behind the two important function-specific MSSs developed by ISO Organization, i.e. Quality Management System (QMS) and Risk Management System (RMS) are largely similar and complementary. Hence, their integration is suggested and a conceptual framework for their integration is introduced. The main driver for such integration is to reduce the number of MSs in an organization and hence to decrease the number of resources employed. It is demonstrated that the integration of QMS and RMS will result in more significant background, cultural context, techniques, procedures and synergy to an organization. The conceptual integration model and the implementation strategy are two fundamental pillars for integration of any two or more MSs. Hence, various conceptual models are examined and a new model is developed and introduced to integrate RMS and QMS. The proposed conceptual framework is built upon a comprehensive review and analysis of authoritative field literatures and is named as the Risk-Based Quality Management System (RBQMS). The developed RBQMS framework is validated and verified in real case processes selected from service sector industry by means of a review questionnaire to collect the H[SHUWV¶RSLQLRQ The proposed RBQMS model was recognized and acknowledged by implementing organizations as an appropriate solution which enables organizations to mitigate and manage the threatening risks at large with easy understanding and using practical guidelines and templates.

Abstrak tesis dikemukakan kepada Senat Universiti Putra Malaysia sebagai memenuhi keperluan untuk Ijazah Doktor Falsafah

PEMBANGUNAN RANGKA KONSEP UNTUK MENGINTEGRASIKAN SISTEM PENGURUSAN KUALITI SISTEM DAN PENGURUSAN RISIKO

Oleh

MAHMOUD ASAD SAMANI

Mac 2016

Pengerusi : Prof. Datin Napsiah binti Ismail, PhD
Fakulti : Kejuruteraan

Percambahan dalam bilangan Sistem Pengurusan (MSS) yang diperlukan untuk menguruskan sesebuah organisasi adalah fakta yang jelas dan mengguna pakai pendekatan integrasi untuk menangani mereka yang MSS adalah cara yang ekonomi-bijak. Keperluan untuk mewujudkan Sistem Pengurusan Bersepadu (IMS) adalah hasil daripada peningkatan jumlah mereka yang terlibat dan Sistem Pengurusan Piawaian masing-masing (MSSS). Kertas-kertas jurnal yang berkaitan dengan integrasi MSS 'berhujah bahawa dalam teori mana-mana dua MSS atau lebih boleh berpotensi disepadukan. Dalam kajian ini, ia menunjukkan bahawa sikap dan pendekatan belakang kedua-dua fungsi khusus MSSS penting dibangunkan oleh ISO Pertubuhan, iaitu Sistem Pengurusan Kualiti (QMS) dan Sistem Pengurusan Risiko (RMS) adalah sebahagian besarnya sama dan saling melengkapi. Oleh itu, integrasi mereka yang disyorkan dan satu rangka kerja konsep bagi integrasi mereka diperkenalkan. Pemacu utama untuk integrasi tersebut adalah untuk mengurangkan bilangan MSS dalam sesebuah organisasi dan oleh itu untuk mengurangkan bilangan sumber yang digunakan. Ia menunjukkan bahawa integrasi QMS dan RMS akan menyebabkan latar belakang yang lebih penting, konteks budaya, teknik, prosedur dan sinergi kepada organisasi. Model integrasi konsep dan strategi pelaksanaan dua rukun asas bagi integrasi mana-mana dua atau lebih MSS. Oleh itu, pelbagai model konseptual diperiksa dan model baru dibangunkan dan diperkenalkan untuk mengintegrasikan RMS dan SPK. Kerangka konsep yang dicadangkan dibina di atas kajian semula yang komprehensif dan analisis literatur bidang berwibawa dan dinamakan sebagai Sistem Pengurusan Kualiti Berasaskan Risiko (RBQMS). Rangka kerja RBQMS maju disahkan dan disahkan dalam proses kes sebenar yang dipilih dari industri sektor perkhidmatan dengan cara soal selidik kajian untuk mengumpul pendapat pakar-pakar '.Model RBQMS yang dicadangkan telah diiktiraf dan diakui dengan melaksanakan organisasi penyelesaian yang sesuai yang membolehkan organisasi untuk mengurangkan dan menguruskan risiko yang mengancam bebas dengan pemahaman yang mudah dan menggunakan garis panduan dan template praktikal.

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3UDVH WR ODODK WKH FKHU VKHU DQ WKH WD QHU RI WKH RUO RU QPH strengths, health and determination to complete this thesis.

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While so many supported the completion of this thesis, any errors or omissions are solely my own responsibility.

I certify that a Thesis Examination Committee has met on 1 March 2016 to conduct the final examination of Mahmoud Asad Samani on his thesis entitled "Development of a Conceptual Framework to Integrate Quality Management System and Risk Management System" in accordance with the Universities and University Colleges Act 1971 and the Constitution of the Universiti Putra Malaysia [P.U.(A) 106] 15 March 1998. The Committee recommends that the student be awarded the Doctor of Philosophy.

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Declaration by graduate student

I hereby confirm that:

- x this thesis is my original work
- x quotations, illustrations and citations have been duly referenced
- x the thesis has not been submitted previously or comcurrently for any other degree at any institutions
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This is to confirm that:

x the research conducted and the writing of this thesis was under our supervision;

x supervision responsibilities as stated in the Universiti Putra Malaysia (Graduate Studies) Rules 2003 (Revision 2012-2013) were adhered to.

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Signature: _____

Name of Member of Supervisory Committee: Norzima bt. Zulkifli, PhD

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LIST OF ABBREVIATIONS

AIHA	American Industrial Hygiene Association
AIRMIC	Association of Insurance and Risk Managers in Industry and Commerce
ALARM	The Public Risk Management Association
ANSI	American National Standard Institute
ARM	Association of Risk Management
AS/NZS	Australian and New Zealand Standards
BSI	British Standards Institution
CEN	The European Committee for Standardization
CG	Corporate Governance
COSO	The Committee of Sponsoring Organizations of the Treadway Commission
CPI	Continual Process Improvement
CSA	Corporate Social Accountability
CSR	Corporate Social Responsibility
EMS	Environmental Management System
ERM	Enterprise Risk Management
GMS	General Management System
IMS	Integrated Management System
IRR	Iranian Rial
ISO	International Organization for Standardization
JSA	Japanese Standards Association
KPI	Key Performance Indicator
LC	Letter of Credit
MMS	Maintenance Management System
MS	Management System
MSS	Management System Standard
OHSMS	Occupational, Health and Safety Management System
P-CMM	People-Capability Maturity Model
PDCA	Plan, Do, Check, Act
PMBOK	Project Management Body Of Knowledge
PMS	Performance Management System
PQR	Product Quality Risk
QA	Quality Assurance
QC	Quality Control
QM	Quality Management
QMS	Quality Management System
RBQMS	Risk-Based Quality Management System
RM	Risk Management
RMS	Risk Management System
SAMS	Social Accountability Management System
SME	Small & Medium Enterprise
TQM	Total Quality Management

CHAPTER ONE

INTRODUCTION

1.1 Research Background

In its simplest form, management is a set of functions with the objective of how to operate and control a company (Labodová, 2004). It is agreeable that the management of a company must be consistent with and logically convergent towards achieving the company objectives. There is a range of formal and informal Management System (MSs) in each and every organization. These MSs are related to various fields like accounting, personnel, finance, quality, risk management, legal aspects, etc. Without these MSs the organization cannot survive or generate profit. These MSs are called partial MSs (Seghezzi, 2001). Karapetrovic and Willborn (1998a) discussed that these MSs are made by organizations on the basis of their respective areas¶requirements.

A MS is the organizational structure adopted for managing the processes and activities and transforming the input resources into an output product/service with the aim of meeting the organization objectives (Link and Naveh, 2006). ISO website defines MS is the set of procedures an organization needs to follow in order to meet its objectives (ISO, 2013). Different MSs are required to manage an organization in an efficient and effective way (Asif et al., 2009; Simon et al., 2012, 2011; Zutshi and Sohal, 2005). Obviously managing a medium or large organization without implementing necessary MSs is almost impossible or at least ineffective and inefficient. Mabert et al. (2003) related the organizational size and scale to their needs to implement MSs. They argued that this need is increased as the organization becomes bigger. Bernardo et al. (2012) cited that large organizations are seemingly tended to implement more standardized MSs than SMEs.

7KH VWDNHKROGHUV¶ WKHRU\ DQG WKH FRQFHSW RI EXVLQHVV VXVWDLQDELOLW\ and stiff competitions are the main drivers encouraging organizations to implement various MSs. Most of the time there are stakeholders requiring these MSs to be implemented (Karapetrovic and Jonker, 2003). Customer is definitely the lead player (stakeholder) requiring satisfactory quality of services and products. Having a QMS implemented in an organization serves for this purpose and ensures that the products and services are satisfactory. A typical manufacturing or service organization must also satisfy the local community (e.g. by generating no waste disposal with adverse effect on the environment), employees (e.g. by no hazardous work conditions), society in general (e.g. by no use of child labor), investors (e.g. by no shady accounting practices) and others (Jonker and Foster, 2002).

Current competitive business environment requires companies to establish well-designed and purpose-specific MSs (Karapetrovic and Willborn, 1998b). Risks threatening the company assets and activities also need to be managed. RM is an increasingly important discipline which has been recognized by organizations in

different industries. A lot of organizations have formed RM departments to manage and control their threatening risks that they are exposed to (Akintoye and MacLeod, 1997).

Thus, managing issues like quality, safety and health, environment protection, risk, customer relationship, etc. all require systematic approaches and procedures i.e. need MSs. Sometimes, some of these matters are enforced by government authorities and it is compulsorily needed to comply with the imposed rules and regulations. Therefore, various MSs and MSSs have been developed and introduced over the years to guide organizations how to manage their potential challenges.

In the past 50 years, several MSs and MSSs have been introduced either by leading international standard developing organizations such as ISO or other relevant bodies. MSs exist in all organizations as every company has a purpose and tries to reach to that purpose with various degrees of success.

1.2 Management Systems Integration

Although different MSs are required to smoothly manage and control an organization, but it is almost impossible to employ several mutually exclusive and entirely independent MSs in a company. This is because usually various MSs have common backgrounds, tools, procedures, etc. and ultimately they have some form of interaction with each other (Labodová, 2004). Therefore, organizations with various individual MSs try to integrate them to facilitate their management processes and activities and at the same time to utilize the associated benefits and synergies (Karapetrovic and Jonker, 2003; Karapetrovic and Willborn, 1998a; Wilkinson and Dale, 2002).

Owing to the increase in MSSs such as ISO 9000, ISO 14000, and some others, a new approach has been developed to integrate them in a way or another so that the costs and redundancies are considerably reduced (Beckmerhagen et al., 2003).

MSSs include requirements and provide guidance on good management practices. The main objective of each MSS is to systematically guide an organization to satisfy each specific group of stakeholders and to supply their needs and expectations. For example, ISO 9001 is a Standard for QMS and now is a widespread phenomenon all over the world. The QMS implementation is a major breakthrough to achieve optimum human effort, best resource allocation and reach to the planned outcome, no matter that the outcome is a product or a service (Forristal et al., 2008). The main concern of a QMS is to manage all quality and quality related aspects in an organization, in a systematic manner and measure the company performance.

EMS, based on ISO 14001 is the second well-known MSS developed by ISO. OHSAS IRU(PSORHHV¶6DIHW\DQG+HDOWK,62IRU5LVN0DQDJHPHQW506$
8000 for Corporate Social Responsibility etc., are other examples of MSSs which are now very popular and widely in use.

Each MSS has a range of requirements and need resources like human, financial and physical. These requirements have apparent implications and obligations for a company management. Top managers have to find themselves committed to all those stipulated or inherent requirements and must supply and maintain the needed resources. Thus, LPSOHPHQWLQJ HDFK 06 UHTXLUHV WRS PDQDJHPHQW¶V DFWLYH LQYROYHPHQ commitment to maintain required resources. Clearly, implementing several MSs at the same time will require even more organizational resources. As companies normally have limited resources, implementing multiple MSs will cause heavy burden to them. To solve this problem, the integration approach in using multiple MSs has been introduced and suggested. The need to create the Integrated Management System (IMS) is the result of increase in stakeholders and the number of MSSs (Asif et al., 2009). Proliferation in the number of MSs which are required to smoothly manage an organization is an obvious fact and the integration approach in dealing with these MSs is an economic-wise manner to manage an organization.

There are evidences in literature and practice that organizations have slowly started to tackle the IMS issue. The journal papers related to Integration of MSs highlight that in theory any two MSs or even more are potentially capable of being integrated, albeit the fact that the integration models and methodologies might be substantially varied and different. As there is no one standardized process for integration of MSs, each organization need to follow their own methodology or use the existing multiple methods (Merce Bernardo et al., 2011).

1.3 Similarities of Quality Management System and Risk Management System and their Potential for Integration

In this research, it is shown that the attitudes, approaches, structure and framework behind the two important function-specific MSSs developed by ISO Organization, i.e. QMS based on ISO 9001:2008 and RMS based on ISO 31000:2009 are largely similar and complementary. The QMS nature requires long-term management planning, implementation and somehow significant cultural changes. These are the necessary ingredients and the building blocks for a successful RMS as well. Hence, the integration of these two MSs has been suggested and a model/methodology for their integration has been introduced. The main driver for such integration is to reduce the number of MSs in an organization and hence to decrease the number of resources employed.

In this research, it has been shown that the integration of QMS and RMS will result in more significant background, cultural context, techniques, procedures and synergy to an organization. RMS is taken into consideration as it is formulated in Risk Management Standard ISO 31000:2009. QMS is also based on the definitions and framework in ISO Standard 9001:2008. These two MSSs are the most famous and the most widely and commonly used standards for RMS and QMS.

1.4 Benefits of Management Systems Integration

Integration of various MSs brings benefits to an organization. These benefits include simplified systems, more optimized resources and a common framework for continual improvement (McDonald et al., 2003). Karapetrovic and Willborn (1998a) suggested the integration of various MSs, no matter what is the form, must always bring a more effective system. Some significant advantages relevant to MSs integration include: improved technology development and transfer; improved joined operational performance; improved internal management methods and cross-functional teamwork; higher staff motivation, lower inter-functional conflicts; multiple audits reduced and streamlined; enhanced confidence of customers and positive market/community image; reduced costs and more efficient reengineering (Karapetrovic and Willborn, 1998a). Such integration will certainly result in improved cost-effectiveness as well.

1.5 Problem Statement

Integration of various MSs in an organization to form an IMS is not a new concept or discipline. The integration of QMS, EMS and OHS and referring to the new created MS as IMS is a common practice in many organizations worldwide. However, the models and strategies which are used for integration and the degrees of integration that are achieved might be different (Merce Bernardo et al., 2011). The literatures supporting the concept of integration of MSs are many and varied. There are strong similarities and commonalities between QMS based on Standard document ISO 9001:2008 and RMS based on Standard document ISO 31000:2009 (Samani et al., 2014). These similarities and some other reasons which will be discussed later, highly encourage for integration of these two function-specific MSs to form an integrated system which from now onward it will be referred to as Risk-Based Quality Management System (RBQMS). Some QMS and RMS similarities are listed in following:

i. Both QMS and RMS are standardized MSs.
ii. QMS and RMS standards which are referred to in this research were published by ISO, hence they are compatible.
iii. Both Standards are generic and can be implemented in any organization regardless of type, size or product.
iv. Both MSs can be implemented for either the whole organization or just a portion of it (a scope within the whole organization).
v. QMS and RMS standards follow roughly the same structure and pattern in their development.
vi. The two MSs encourage for process approach adoption.
vii. Both support the PDCA methodology.
viii. Both emphasizing on organizational objectives achievement.
ix. Both standards requirements are systematic, structured and timely to implement.
x. RMS and QMS facilitate continual improvement and organizational enhancement.
xi. RM is considered as an integral part of all organizational processes and hence it can be part of QMS processes as well.

Therefore, the subject of this research which is going to be scrutinized in detail is focusing on the integration of these two different disciplines i.e. QMS and RMS. This integration gives assurance that the QMS can achieve its intended result(s) and prevent, or reduce undesired effects while it can achieve continual improvement.

In one hand, the Clause 4.3.4 in RM Standard ISO 31000:2009 has been titled as: ³,QWHJUDWLRQ LQWR RUJDQL]DWLRQDO SURFHVVHV´ which states that RM should be embedded (i.e. integrated) in all organizational practices and processes relevantly, effectively and efficiently. In fact, the RM process should be an integral part and not distinct from those organizational processes. Particularly, RM should be embedded (integrated) and become an essential part of policy development, strategic planning and change management processes. Also, the second RM principle in ISO 31000:2009 requires RM to be an integral part of organizational processes. Therefore, the intention of ISO 31000 is not to produce a separate MS but the aim is to suggest a framework to guide how to integrate RM into overall organizational processes. That is why the ISO 31000:2009 frequently emphasizes on creation of a framework for managing the risks and not the creation of a RMS. In fact, the RMS Standard recommends a framework to implement RM and not a separate MS. This framework contains of the general guidelines on how RM should be embedded / integrated into all organizational processes. However and notwithstanding of this significant fact, the RM Standard GRHVQ¶W DQVZHU WR provide an example for this very important question in a practical way that: how RM processes can be integrated into other organizational processes? In chapter 2, it will be shown that the integration model and its supporting implementation methodology are the two pressing needs for integration of any two, three or even more MSs. Also, it will be presented that the integration of RMS and QMS is a research field with less exploration.

In the other hand, the QMS Standard based on ISO 9001:2008 promotes the adoption of a process approach when developing, implementing and improving the effectiveness of a quality management system, to enhance customer satisfaction by meeting customer requirements. The adoption of process approach has even been reflected in the QMS principles. In essence, the process approach is one of the main pillars for developing a QMS based on ISO 9001:2008. In this ISO Standard the process approach is defined as:

³7K *e application of a system of processes within an organization, together with the identification and interactions of these processes, and their management to produce the GHVLUHG RXWFRPH´ (ISO 9001, 2008).*

The organization shall determine the processes needed for its QMS and define their application throughout organization and shall determine their interactions. No doubt that the risks and opportunities associated with each process and the proper planning and implementation of appropriate actions to address them need also to be a major part of the planning stage in each process.

7KH,62 RHVQW UHTXLUH DQ RUJDQL]DWLRQ WR FRQVLGHU LVVXHV WKDW implementation. Section 04 in introduction part of ISO 9001:2008 declares that it does not include requirements related to other MSs, like those specific to EMS, OHS, FM or RM. Nevertheless, ISO 9001:2008 enables an organization to align or integrate its own 406ZLWKUHODWHG06V¶UHTXLUHPHQWV

In this research it is tried to demonstrate how to add or integrate RM to each organizational processes. This means, the whole organization will be looked upon as a system constitutes of processes and it will be shown that RM can be added as an integral part to each organization process. This is entirely in line with the second principle of RM standard ISO 31000 which requires that RM must be an integral part of organizational processes. Therefore, the ultimate intention of this research is to find a practical methodology in line with the requirements of both RMS and QMS international ISO Standards to show how RM processes can be integrated into QM processes.

1.6 Research Significance

The RBQMS as an integration framework for integrating RMS processes into QMS processes gives assurance that the ultimate and intended goals and objectives of the QMS can be achieved and most of undesired effects can be eliminated, prevented or largely reduced. Integration of QMS and RMS in an organization is reasonable and logical. When an organization is in service sector, the integration of these two MSs would be even more meaningful, useful and feasible. Compared with production or manufacturing organizations, many of the service sector entities have less or even no environmental aspects with very minimal safety and health issues for their workers and employees. Thus, usually it would be difficult to justify EMS or OHSMS implementation in many service sector organizations. Of course, there are service sector organizations like hospitals, airlines, hotels, restaurants, etc. that they necessarily need to have EMS and OHSMS systems. But a big bunch of service sectors companies have no EMS or OHSMS issues convincing them to implement those MSs. Legal, accounting, banking, insurance, many governmental agencies, etc. are less likely to need EMS or OHSMS. For them, EMS or OHSMS may not be as necessary as QMS or RMS. The service sector organizations as like as manufacturing companies, have certain customers and other stakeholders who must be satisfied. As such they need to implement QMS. Also they are exposed to a diverse range of positive or negative risks which motivate them to implement RMS. It shall be noted that in this research the negative side of risks will only be taken into consideration. Thus, QMS and RMS implementation and their integration seems more logical, essential and desired in service sector organizations.

Systematic literature review reveals the fact that the number of IMS literatures are increasing. In 2002, just 4 papers were published while this has been increased to 13 papers in 2012. Statistics show the number of IMS publications have been increased year on year from 1998 until 2013. This increase even more accelerated in the past 5 years. Fig. 1 shows the trend.

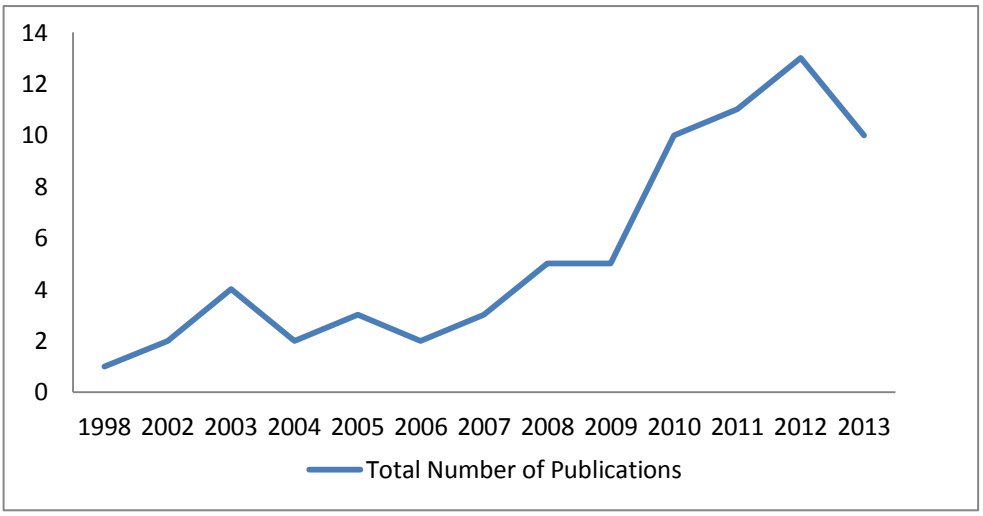

Figure 1-1. IMS publication growth (Poltronieri et al., 2015)

The literature survey results also show that the IMS publications have been mostly published in two important journals: µJournal of Cleaner Production ¶ and µThe TQM Journal¶ (Poltronieri et al., 2015). The first journal belongs to ELSEVIER group with 5 years impact factor as 4.088. The second journal is under the Emerald publishing group.

Another recent paper written by Bernardo et al. (2015) provides a comprehensive literature review of those IMS authors who have counted a range of benefits and advantages for MSs integration and advocated the IMS implementation. More details on IMS benefits have been given in section 2.4.9.

There are lots of studies supporting integration of the standardized MSs. These studies focus on the integration advantages, methodologies, degrees, etc. (Simon et al., 2011).

1.7 Research objectives

The research objectives are:

A. To identify the barriers and gaps in integration of RMS and QMS;
B. To develop a conceptual model for integration of QMS and RMS;
C. To develop a methodology to show how RBQMS can be implemented; and
D. To validate and verify the RBQMS model.

1.8 Research Scope

As an overall categorization, the scope of this research can be divided into two main areas. The first area is WKH JHQHUDO FRQFHSW RI 06V¶ LQWHJUDWLRQ which will be studied and scrutinized LQ D FRPSUHKHQVLYH PDQQHU 7KH XQGHUO LQJ FRQFHSWV LQ 06V¶ integration related to the notions like integration meanings, strategies, models, degrees and their benefits and challenges will be deliberated in detail to find out what are the major relevant aspects in this field of study. Second, the integration concept of RMS and QMS will be taken into a rigorous consideration to catch on the approaches, models, methodologies, etc. which have so far been employed to integrate RMS into QMS. These studies will be carried out on the credible and authoritative literatures relevant to this research field and will figure out a firmer understanding of the general FRQFHSW RI 06V¶ LQWHJUDWLRQ and its particular application to the more specific area of RMS and QMS integration.

7KH FRQFHSW RI 06V¶ LQWHJUDWLRQ LV DQ LQWHUHVWLQJ DUHD IRU UHVHDUFK &XUUHQW authors have contributed in building up and moving forwards the body of knowledge in this field, yet there are a lot of areas for improvement. The literature review in Chapter two shows that there exist some gaps in this field of study which need to be filled by other researchers¶ contribution. For instance, the conceptual models for integration are still in premature development stage. Although there exists four views for conceptual models development (function view, information view, resource view and decision view), only one view/approach i.e. the function view has been used so far. Meanwhile, the integration conceptual model must be supported by an implementation methodology. It will be demonstrated in chapters 2 and 4 that there are serious gaps in this regard and the implementation methodologies are among the most important requirements which are still missing.

Finally, considering the integration of RMS and QMS and albeit the importance of this topic, it will be shown in chapter 2 that this area has not been explored in detail by far. There are not only limited conceptual models but also very less has been deliberated about the IMS implementation methodologies.

1.9 Research Structure

The methodology in this research is based on theoretical studies or descriptive methodology which consists of a comprehensive review of relevant literatures mainly were published in the past 20 years or so. In this review, a categorization mechanism is employed to facilitate understanding the topic in a sequential order. The literature review highlights the progresses and actions taken over the past years to integrate various MSs with focus on integration of RMS and QMS. This comprehensive study unveils the gaps and barriers there exist in integration of RMS and QMS which is the objective A in this study. The main and ultimate objectives of this research are objectives B and C. It is about developing a conceptual framework for integration of RMS and QMS based on their respective ISO MSSs. The framework means the conceptual model and its implementation methodology. The model is developed by detailed consideration of different views so far has been applied in credible and

authoritative literatures for 06V¶ integration. The systems concept and the meta-management approach/philosophy play the major role in developing the new RMS and QMS integration model. The proposed model shall provide a consistent and effective mechanism for integration of these two MSs. The suggested model should also satisfy the needs and requirements of various respective stakeholders of RMS and QMS.

The RBQMS model needs a supporting methodology to guide how it can be implemented. Developing such a methodology is the objective C requirement. To do so, a methodology is developed in the form of a flow diagram to guide how RBQMS can be implemented in real practices.

Validation and verification of the proposed RBQMS model in real case scenarios is the objective D of this study and in chapter 4 it is shown how RBQMS can be implemented in real case processes selected form service sector organizations. For this purpose, 3 organizations which are from the service sector have been selected and the RBQMS has been implemented on some of their selected processes. In total the RBQMS has been tested on 4 processes and the opinion/feedback of the experts in those companies has been collected by using a reviewer questionnaire as a validation and verification tool. Refer to chapter 3 and appendix IV for more detail.

It needs to be emphasized that in this research the testing and validation and verification of RBQMS model has been subjected to a number of limitations. Firstly, finding suitable companies to implement RBQMS is an issue. The suitable companies shall have implemented or at least be familiar with individual RMS and QMS as per their respective ISO Standards. It will cause difficulties in RBQMS implementation if WKH\GRQ¶W NQRZ WKHVH GLVFLSOLQHV DQG DUH XQIDPLOLDU ZLWK 506 DQG 406 XQGH concepts. Secondly, the implementing organizations shall be interested in devoting and allocating resources which enable for smooth implementation of RBQMS. To successfully implement the model, it is required that the implementing organizations to form a panel or team of relevant experts with proper training and familiarity with the two RMS and QMS concepts. Then, they are required to use various risk identification tools such as brain storming, panel discussions, etc. to identify the risks¶VRXUFHVwithin each activities of a process. No doubt that the risk identification is the most time consuming task and requires a lot of expertise, human and financial resources which must be allocated by the implementing organization if proper RBQMS implementation is expected. Last but not the least, the whole RBQMS implementation procedure and the data which are collected are by large qualitative and not quantitative. This difficulties and limitations will be further explained in sections 3-12 and 4-10.

The research starts in chapter 2 with a comprehensive literature review to recognize and identify the underlying concepts, principles and models used in 06V¶ integration with focus on RMS and QMS and to uncover what are the respective barriers and gaps. Various MSs¶ integration models, methodologies and strategies which have been presented in authoritative journal literatures will be taken into consideration.

Chapter 3 covers the research methodology in full details. The methodology flow diagram and steps taken in building up the generic RBQMS integration model will be

discussed in chapters 3 and 4. Finally, research discussion and conclusion and the proposed future research fields are presented in chapters 4 and 5.

1.10 Novelty, innovation and contribution

RBQMS is a genuine and untouched one. The concept of integrating RM into other management systems is not something new. However the integration of QMS and RMS is an area with less exploration (Labodová, 2004). One novelty of this research is associated with the conceptual RBQMS framework which will be developed in this research. The model is a schematic representation shows how RM processes shall be applied to QM processes. Also, RBQMS implementation methodology is to some extent (not in all aspects) innovative and can be considered as another novelty for this research.

CHAPTER TWO

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