The Relationship between Knowledge Management Practices and Enterprise Risk Management in Higher Education: An Action Research Study
by Duaa Abaoud

Claremont Graduate University
2018
© Copyright Duaa Abaoud, 2018. All rights reserved.

www.manaraa.com

ProQuest Number: 10846841

All rights reserved

INFORMATION TO ALL USERS
The quality of this reproduction is dependent upon the quality of the copy submitted.

In the unlikely event that the author did not send a complete manuscript
and there are missing pages, these will be noted. Also, if material had to be removed,
a note will indicate the deletion.

ProQuest 10846841

Published by ProQuest LLC (2018). Copyright of the Dissertation is held by the Author.

All rights reserved.
This work is protected against unauthorized copying under Title 17, United States Code
Microform Edition © ProQuest LLC.

ProQuest LLC.
789 East Eisenhower Parkway
P.O. Box 1346
Ann Arbor, MI 48106 – 1346

www.manaraa.com

APPROVAL OF THE DISSERTATION COMMITTEE

This dissertation has been duly read, reviewed, and critiqued by the Committee listed below, which hereby approves the manuscript of Duaa Abaoud as fulfilling the scope and quality requirements for meriting the degree of Doctor of Philosophy.

Terry Ryan

Claremont Graduate University

Chair

Lorne Olfman

Claremont Graduate University

Committee Member

Tamir Bechor

Claremont Graduate University

Committee Member

www.manaraa.com

Abstract

The Relationship between Knowledge Management Practices and Enterprise Risk Management in Higher Education: An Action Research

by

Duaa Abaoud

Claremont Graduate University: 2018

The central objective of this dissertation is to investigate the relationship between Knowledge Management (KM) and the components of the Enterprise Risk Management (ERM) process in higher education. Moreover this dissertation aims to explore KM best practices that improve ERM implementing. This research was used to help Claremont Graduate University (CGU) and The Claremont Colleges Services (TCCS) to improve their ERM process by conducting action research. The two organizations have very different ERM practices and different maturity levels. These differences represent perfect case studies to clarify the effect of KM on the development of ERM process.

The intervention through this action research helped CGU and TCCS to overcome a number of obstacles with their ERM process and to evaluate how KM could facilitate their issues with the process. Prior to the research, ERM processes were time and resource consuming. The intervention of the research dramatically reduced the time and recourses needed to perform ERM activities. Thus, both organizations are planning to keep integrating the system with ERM processes and activities.

www.manaraa.com

This dissertation focuses on three themes of the ERM process: risk assessment; risk monitoring, and risk communication and consultations. The analysis identified patterns and best practices of KM process that are associated with risk assessments, risk monitoring, and risk communication and consultations. Specifically, the results tied risk assessment with a hybrid approach between Human-based KM and the KMS. Knowledge transfer was one of the critical KM processes that provided a holistic view of risk across the organization and empowered risk assessment and monitoring. The results show that KMS helped the organization to collaboratively evaluate the areas that need risk monitoring and use the already existing organizational resources. The study identified direct connection between up-to-date access to the risk registry and an organization's ability to communicate about risks.

Findings from the study uncover that there are some unique aspects to implementing ERM in the higher education environment. The results of this empirical research confirm and explain the relationship between the ERM process and KM.

www.manaraa.com

Table of Contents

www.manaraa.com

www.manaraa.com

www.manaraa.com

www.manaraa.com

LIST OF TABLES

www.manaraa.com

LIST Of FIGURES

www.manaraa.com

CHAPTER ONE: INTRODUCTION

Acquiring and managing risk knowledge is a major issue in organizations (Paape & Spekle, 2011). However, organizations can struggle to acquire and manage such knowledge. At the same time, Knowledge Management (KM) has emerged as a strategy to support institutions at all levels of operation. Many studies have indicated that KM is one key to achieving competitive advantage as well as organized long-term success and survival (Kamya, Ntayi, J., & Ahiauzu, A., 2010; Meihami & Meihami, 2013; Jubran & Mansouri, 2015; Omotayo, 2015).

Risks are not the same for all organizations. The risks in the commercial and financial industries are completely different from the risks in the education sector. The risks faced by the commercial and financial firms often involve simple, clear, and direct threats to their quality and continuity, while those faced by higher education institutions often include threats that are more complex, unclear and indirect (Maher & Husain, 2014). Recently, higher education institutions showed the need for a risk management approach that provides a holistic view of its diverse and dynamic environments. Risk management in universities can be utilized in different areas like strategic and academic planning, forecasting, risk prevention, budget reduction and obtaining necessary resolutions to problems (Maher & Husain, 2014).

This study seeks to investigate the effect of introducing KM to a current Enterprise Risk Management (ERM) process. The study aims to monitor and evaluate the changes and the efficiency of the steps of the ERM process that are associated with KM implementation. Action research was conducted in two different higher education organizations: The Claremont Graduate University (CGU) and The Claremont Colleges Services (TCCS). These

www.manaraa.com

organizations employ distinct ERM processes and practices, and vary in their ERM maturity levels. The study results can help the research community to understand the relationship between KM and ERM implementation in higher education.

1.1. Research Motives and Significance

In 2013, the Association of Governing Boards of Universities and Colleges (AGB) and United Educators (UE) conducted a survey to identify the maturity level of ERM practices in higher education institutions. The results indicated that universities do not attempt to apply ERM practices despite the increased risks in these educational institutions. A comparison of the results of the 2008 and 2013 surveys shows a decrease of 16% in respondents who believe that risk management in universities was an essential part of the university culture. In the 2008 survey, 39% of respondents said that their institutions had applied the principles of ERM in their universities in the last two years. However, the 2013 survey showed that 61% of respondents said that their schools are not utilizing any form of RM or they do not have any information on this subject (The Association of Governing Boards of Universities and Colleges [AGB] and United Educators [UE], 2014). These statistics reflect the organizations' struggle to understand and implement the ERM, and the lack of the practical knowledge about the ERM process in higher education.

There is also a lack of empirical research concerning ERM programs, and the academic and theoretical literature about ERM is very limited. The factors associated with the success and the failure of ERM within an organization are also unknown and under-researched (Beasley, Branson, & Hancock, 2005; McShane, Nair & Rusturnbekov, 2011). Additionally, the research presented in this disertation addresses the lack of information

www.manaraa.com

available regarding the relationship between ERM and KM in general, and in higher education specifically.

Rodrigues and Edwards (2014) stressed that the integration of KM into ERM needs to overcome barriers between regulatory silos, increasing the exchange of knowledge in various risk management areas. They added that risk management and KM have been studied almost separately. KM utilization in risk management has not received sufficient attention (Rodriguez, 2010). Furthermore, the few studies that have attempted to investigate the relationship between KM and ERM have been conducted in financial institutions or IT projects (Alhawari, Karadsheh, Nehari, Talet, & Mansour, 2012; Rodriguez & Edwards, 2014; Rodriguez, 2010).

In addition, Talet and Talet (2014) suggest that KMs are perceived as promising strategic resources for higher education organizations because they can have a significant influence on preventing and controlling higher education risks. The use of KM to enhance the efficiency of RM processes is a very recent and important research area. As such, there is little research that evaluates and addresses the issues related to the use of KM in the RM process.

The higher education sector that is the focus of this current dissertation increases the importance of the study, since the least amount of research literature in this domain concerns higher education institutions. These concepts usually are investigated in industrial or financial institutions. In recent years, some higher education organizations have begun to implement ERM manage risks respond to external stakeholder demands, and take a proactive strategy to deal with risk (URMIA, 2007). Previous studies have shown that higher education institutions are struggling to understand and implement risk

www.manaraa.com

management practices (Rodriguez, 2010; Jalal, AlBayati, & AlBuainain , 2011; Rodrigues & Edwards, 2014; AGB and UE, 2014).

Although several research projects have addressed topics related to ERM in higher education, they are usually very specific to one side of the risk management process, like studying the development and implementation of crisis and emergency preparedness plans (Mitroff, Diamond, & Alpaslan, 2006) or articulating the type of risks affecting higher education from without (Campo, 2009; URMIA, 2007). The results from these studies show a need to examine the factors that power ERM practices in higher education.

1.2. Problem statement

The problem that is addressed in this research is the lack of information available regarding the relationship between ERM and KM in general and in higher education (HE) specifically. According to Acharyya (2008), academic researchers need to develop ERM theories, however the development of a grand theory of ERM is a distant goal. There exists a need for more practical research efforts to develop an overall understanding of the factors and theories associated with ERM (Acharyya 2008; Beasley, et al., 2005; Helsloot and Jong, 2006; Tight, 2003).

The results from previous research show that there is need to examine the factors that empower ERM practices in higher education. The literature shows insufficient knowledge within higher education about how to manage institutional risk. This underscores the need for a careful study that discovers the relationship between KM and ERM in higher education institutions; whic is what the present study seeks to achieve.

www.manaraa.com

1.3. Theoretical Background

This action research aims to assess the correlation between KM implementation and the effectiveness of the different components of the ERM process in higher education. The research will examine the factors associated with the effective integration of KM into risk management in higher education. Contingency Theory can inform the action research stages because it mainly promotes the fact that there is no single best approach to managing and operating an organization. Furthermore, an organizational strategy that works in some circumstances may not be as effective in others. Contingency factors, like technology and environments, promote uncertainty, which is the major challenge to organizations (Thompson, 1967).

The utilization of Contingency Theory will help the researcher to modify the KM implementation and ERM practices that are affected by numerous contingent variables. These variables include: board practices, management objectives, organization size, growth rate, maturity level, type of IS, nature of communication, organization risk culture, regulation, and business type.

ERM is well recognized in higher education for achieving a holistic Risk Management process (URMIA, 2007; AGB and UE, 2014). ERM aims to enhance an organization's ability to reach its overall objectives by implementing senior leadership practices to manage risk (The Committee of Sponsoring Organizations COSO, 2004).

The most widely used frameworks for ERM in higher education are the COSO: 2004 – Risk Management Integrated Framework and ISO 31000 Risk Management - Principles and Guidelines. Both the COSO ERM and ISO 3100 are holistic approaches that enable organizations to apply generic risk management practices (Gjerdrum & Peter, 2011).

www.manaraa.com

This study adopted ISO 31000 to be the theoretical foundation that explains the ERM process and the baseline to understand the connection between ERM and KM (see Figure 1.1). ISO 31000 focuses on the application and the administrative parts of the ERM process. ISO 31000 is a simpler and easier framework than the COSO model, which is more complex and multilayered. Whereas COSO focuses on the effectiveness of procedures and processes, ISO 31000 enhances the achievement of set goals through the application of specific standards of the sector (Dali & Lajtha, 2012; COSO, 2012). ISO 31000 is designed to be used by any enterprise, association, or group (RIMS, 2011). It also "targets the quality of an organization's management and suggests risk management frameworks, processes, and activities that should be followed to help organizations better achieve their objectives" (Shortreed, 2010, p. 8).

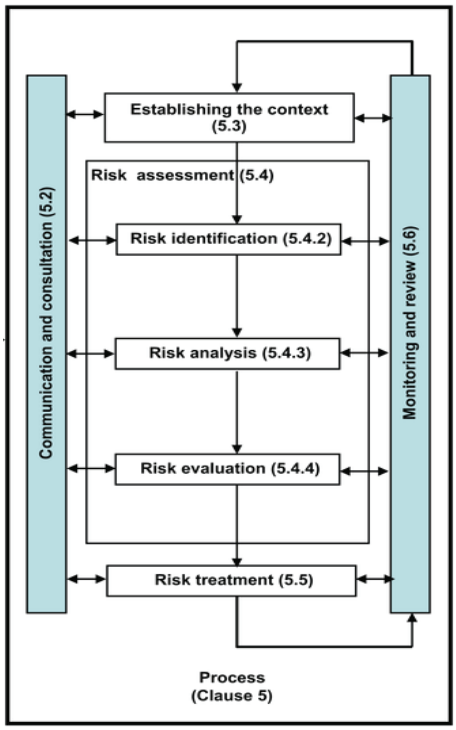
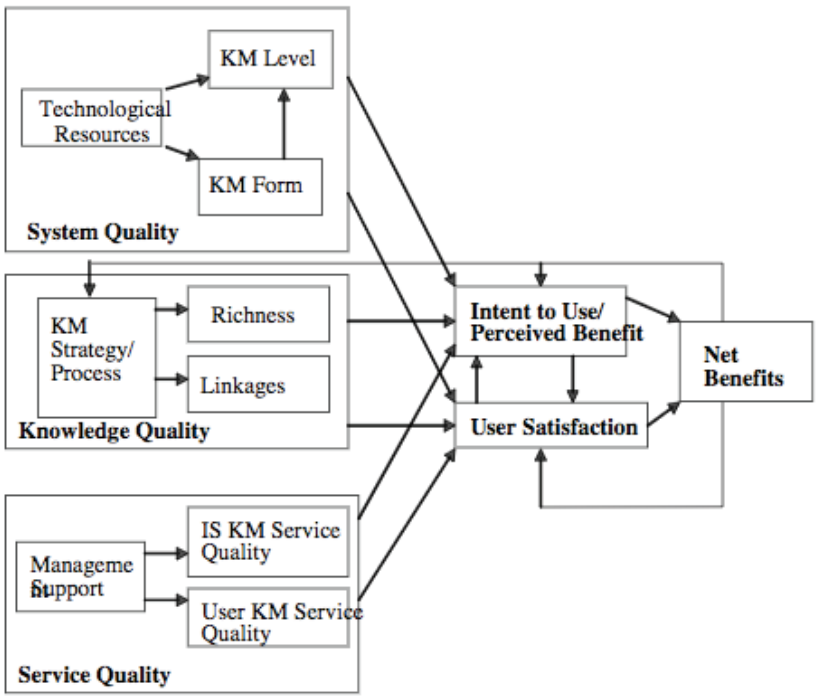


Figure 1. 1 The ISO 31000:9000 ERM process

www.manaraa.com

This study also uses the Knowledge Management framework proposed by Alavi and Leidner (2001) as the framework that summarizes the core components of the KM process. There are four processes in the framework that illustrate the KM Life Cycle: knowledge creation, knowledge storage, and knowledge transfer and knowledge application. These processes represent an interconnected set of activities that are essential for effective organizational KM (Alavi & Leidner, 2001; Jennex, 2008). These processes are influenced by both technological and organizational structures, which is ideal for the purpose of this research.

In addition, the study will utilize the Jennex and Olfman KMS Success Model (2004) to evaluate the success and the effectiveness of KM integration through the evaluation of the improvement in the ERM process (see Figure 1.2). The model will be used to facilitate the evaluation phase of this action research to reflect the KM impact on the performance of the main areas of the ERM process.



www.manaraa.com

Figure 1. 2 Jennex and Olfman KMS Success Model (2004)

1.4. Preliminary Conceptual Framework

After an initial literature review and before collecting any data, the researcher proposed a conceptual framework to guide this research (see Figure 1.3). The conceptual framework is designed based on the theoretical background previously discussed. The main focus of this research is to examine what and how KM practices directly impact the three main areas of ERM (risk monitoring, risk communication and risk assessment) and indirectly impact the internal elements of ERM process (establishing context, risks identification, analysis, evaluation, and treatment).

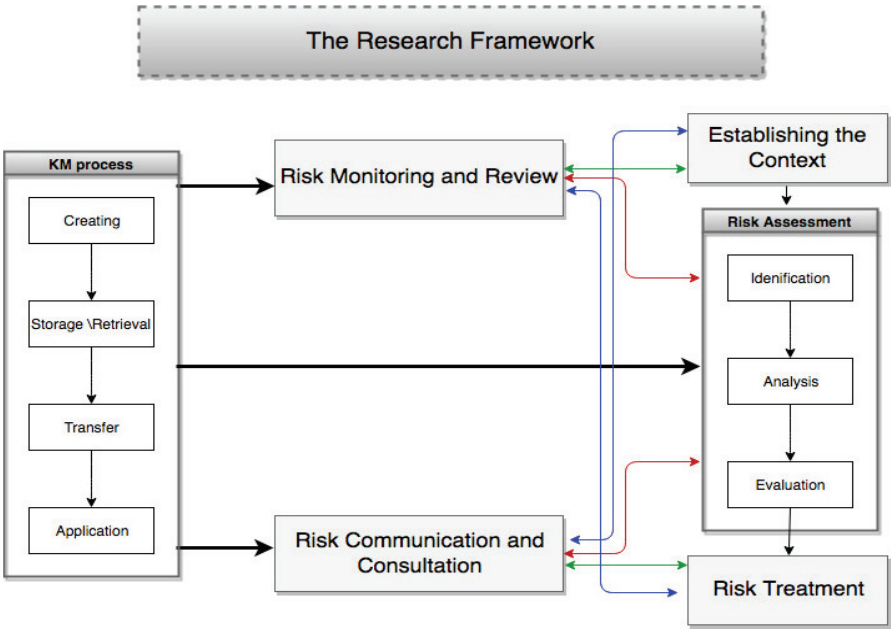


Figure 1.3 The Research Framework

1.5. Research Objectives

This Action Research has four main objectives. First, to study and understand the ERM process in higher education and how KM might play a role to advance ERM practices. Second, to customize and implement KM systems based on CGU's and TCCS's needs. Third,

www.manaraa.com

to apply ERM and KM theories to guide the decision making process during the action research. Lastly, to evaluate the effectiveness of the customized systems and to determine whether, and if so, how the KM practices associated with ERM improved CGU's and TCCS's ERM process.

The research questions addressed in this study are as follows:

1. What is the nature of the relationship between the ERM process and KM in higher education?

   1.1 What is the relationship between risk assessments and KM?

   1.2 What is the relationship between ERM risk monitoring and KM?

   1.3 What is the relationship between the "ERM line of communication and consultation" and KM?

1.6. Research Contributions

The key contribution of this research is within the lessons learned about how to support ERM with KM. The study will help the research community understand the areas where KM plays a role in enhancing the ERM process and the dynamics of the links between KM and ERM. The study will provide practical and essential insights that do not exist in the current body of research.

This research contributes to the community of knowledge by generating/testing new theories and assumptions through action research (AR), which is considered a useful methodology that runs in a practical problem-solving environment (Di Mascio & Tarantino, 2015). ERM is a new management practice with insufficient experimental research on implementing ERM strategies in complex organizational environments, such as higher education (Fraser, Schoening-Thiessen, & Simkins, 2008).

www.manaraa.com

Action research is used to help CGU and TCSS advance their ERM process and overcome thier current obstacles. Action research will help validate the results in a practical setting to collect more information about the types of relationships between the ERM process as a whole and KM practices in higher education.

In addition, higher education is an under-researched field (Tight, 2003). Higher education is considered one of the slowly developing fields and one of the least researched in different areas like public policy and administrative development (Kohoutek, 2013). ERM-related research is included as one of the fields that higher education researchers have overlooked. However, the recent interest in ERM in higher education and lack of clarity on how to implement ERM created the need to develop empirically grounded guidelines that discuss the context in which KM is going to advance and guide the ERM process in higher education (URMIA, 2007; AGB & UE, 2014).

The researcher aimed to prepare the way to develop a framework that explains and guides knowledge risk management in higher education. ERM is a new management practice with insufficient experimental research on implementing ERM strategies in complex organizational environments such as higher education (Fraser et al., 2008). Clarifying the relationship between KM and ERM practically will enable us to draw a framework that assists in the establishment of KM practices within ERM and encourages officials in higher education to actuate the application of KM in their ERM processes. However, the dissertation contribution lies in the kind of learning that action research enables.

The study findings, as well, provide useful information to top management and policy makers in higher education in order to assess them through the implementation and

www.manaraa.com

development of ERM. The results of this study may encourage universities to increase their level of interest in KM. This study is one of the few that investigates ERM in higher education and examines the relationship between KM and ERM process in a practical setting.

1.7. Definition of Terms

Knowledge management (KM). KM is defined a set of processes that control, create, disseminate and use knowledge by practitioners to provide them with the cognitive theory background needed to improve the quality of decisions (Dhamdhere, 2015). It is also defined as the processes and activities that assist an organization in acquiring, organizing, using, and disseminating knowledge, and employing them in various administrative activities such as decision making, work procedures and strategic planning (Chinowsky & Carillo, 2007).

Risk. Risk, or crisis, is a state of imbalance or consistency between what has been done, and what should be done (Oblakovic, 2013).

Risk management (RM). RM is the process to measure and assess risk, and develop strategies to deal with it, which include the transfer of risk outside the organization, or avoidance of risk, or reduction of its negative effects (Siayor, 2010). Risk management can also be defined as the process of systematic preparation and assessment of internal and external problems that seriously threaten the reputation of the organization (Oblakovic, 2013).

Enterprise risk management (ERM). ERM is a process that involves identifying risks, avoiding risks, and taking advantage of opportunities to achieve certain goals (Dafikpaku, Eng & Mcmi , 2011). It is also defined as an organization-wide process to identify, analyze,

www.manaraa.com

evaluate, process and monitor risks that may affect achieving its goals (Renault et al., 2016).

Risk culture. Risk culture is the method in which individuals in any given organization deal and interact with risks and its associated effects within the corporate culture (Kunda, 1995).

Organizational culture. Organizational culture is the set of values, beliefs, and communication norms that the members of an organization share, representing the rules of behavior within the organization (Schein, 2004).

1.8. Organization of the Dissertation:

This dissertation contains five chapters:

- Chapter one offers an introductory summary of ERM in higher education, identifying the practical problem addressed by this research, the gaps in empirical research, and the significance of this research. It also introduces a preliminary conceptual framework that will help to answer the research questions.
- Chapter two gives a preview of the literature about the main components of the study. The chapter covers topics like ERM practices and KM process, and a theoretical discussion about organizational theory, organizational change, contingency theory and action research theories.
- Chapter three provides a description of the methods and procedures, data collection and analysis approaches, and the limitations of the study.
- Chapter four includes the core of this dissertation, which is the detailed story of the action research. The chapter contains two research cycles conducted at CGU and an action research cycle at TCSS.

www.manaraa.com

- Chapter five describes the contributions of this study: what has been learned in CGU and TCSS that could be valuable to other organizations and the research community. The chapter includes lessons learned about integrating KM with ERM and performing action research. It also includes limitations and suggestions for future research.

www.manaraa.com

CHAPTER TWO: LITERATURE REVIEW

2.1. Introduction

Today, the world is witnessing a huge wave of changes and innovations, which force organizations from various industries to implement strategies and management philosophies that help them sustain their business and stay in the market (Maher & Husain, 2014). Various organizations face many risks in doing business, which leads to many crises, and the main challenge that faces management is to determine the amount of risk that they can face successfully. Institutions that wish to maintain their competitive position in the market should be able to manage these risks with high efficiency, where the adoption of a strategic approach to risk management is one of the most important ways to reduce an organization's exposure to these risks (Setapa et al., 2015).

Until recently, risk management looked at productivity-related research, but then the concept of risk widened to encompass other dimensions such as individuals' interactions, and external and internal environments. Traditional risk management seeks to manage risks individually without finding the relationship between the risks (Setapa et al., 2015). As a result, the concept of ERM has emerged as a means to improve the way in which risks are addressed and controlled (Stephen, 2001). In the 1990s, ERM became a critical process because of increased organization losses due to the complex and dynamic environment in which institutions operate (Setapa et al., 2015).

As a result of the increasing risk surrounding organizations, many now seek to apply ERM as a modern strategic concept that aims to deal with risks effectively and efficiently (Setapa et al., 2015). ERM has improved management's capacity to understand, identify, and manage risks; and improve planning and the decision-making process (Rodriguez

www.manaraa.com

2010). ERM seeks to reduce deficiencies associated with the traditional approach to risk management through comprehensive and integrated risk management (Rodriguez & Edwards 2014). ERM also seeks to enable management to identify key risks, which may have a broad impact on the organization (Degagne et al. 2004).

Although higher education has a significant role to play in the development of society, and it is directly related to the business sector in general, the higher education sector is far from comprehensive in implementing ERM practices that control and mitigate risks (Tufano, 2011). In 2003, the National Association of College and University Business Officers (NACUBO) prepared a report on the need to implement risk management programs and tools in higher education institutions (Helsloot & Jong, 2006). In 2007, three prestigious organizations in the higher education sector issued papers aimed to motivate universities to implement ERM in higher education institutions (Zadeh, 2010).

The results of current literature review increased the importance of the need to examine the relationship between KM and ERM, particularly in higher education institutions. Previous studies have shown that there is neither a clear relationship nor impact of KM on the perceived value of ERM. The current chapter will discuss the main literature about the subject and show the gap in the previous theoretical literature in this area.

2.2. Organizational and change theories

2.2.1. Organizational Theory

Organizational theory addresses the activities of companies in order to understand and appreciate their functions which include contingency systems and classical, organizational and neoclassical systems types, being based on many standpoints

www.manaraa.com

from modern and postmodern paradigms. The classical theory of organizational management evolved during the time of the industrial revolution. The focus of the theory is productivity and organizational efficiency but does not consider the attribute of employees' behavior (Shafritz, Ott & Jang, 2015).

Systems theorists claim that organizational systems are interconnected, hence, if one-system changes, it creates an impact on other systems. Systems theory portrays companies as open organizations, which are in an evolving equilibrium state so that they are constantly adapting and changing to suit different situations and environmental conditions (Jones & Jones, 2010). Organizational components are interrelated in a nonlinear manner, thus enabling the complex comprehension of companies under systems theory.

2.2.2. Organizational Change Theory

Organizational change is described as the change an organization makes from its old state to a new desired state to improve effectiveness and efficiency. As managers consider organizational change, they must strike a balance between the need to enhance running operations with the need to consider future unpredictable incidences (Weick & Quinn, 1999).

As indicated by Spector (2007), there are three types of change under organizational change theory, namely evolutionary change, revolutionary change and Lewin's force-field theory of change. Evolutionary change is described as slow, upward and specific. It is not sudden but a gradual improvement in company operations. Revolutionary change is fast, drastic and unexpected; moreover, it is termed as rapid, sudden and unspecific in nature. These two sets of forces always oppose each other in an organization.

www.manaraa.com

Furthermore, Burke (2017) states that revolutionary change usually happens when a company is faced with a sudden change in the market economy, or after the introduction of new technology that is vital for the company's function. Thus, for effective organizational change, the management must devise strategies to maximize the factors that cause effective change and minimize the ones that are resistant to change (Cameron & Green, 2015).

2.2.3. Contingency Theory

Contingency theory's fundamental idea is that every organizational environment is different and the process must be designed to fit the specific environment. The external and internal factors and challenges that every organization faces require the implementation of different organizational tools and characteristics (Seidel, Howell & Windahl, 2010, p. 257). The characteristics of any organization are affected by multiple contingency factors that are inter-related with each other and with the design of any new implementation or design within the organization (Mintzberg, 1979).

Under contingency theory, actions are influenced by the complexity of the organizational situation and the surrounding independent and dependent variables (Donaldson, 2001). Contingency theory assists any organization to operate under various environmental circumstances instead of offering a definite solution to company problems (Whalen et al., 2016). Thus, it describes the organization's ability to adapt to both internal and external factors. Further, contingency theory applies behavioral, systems and classical approaches to integrate the different principles of change depending on the situation of the company. The theory is adaptive in nature embracing strategies that assist in adjusting effectively to external factors (Otley, 2016). In addition, the theory assists in restructuring the organization's information and decision processes. Contingency theory has well-

www.manaraa.com

devised leadership and motivational approaches that help to inspire employees.

According to Thompson (1967), changes in technology and organizational operation are examples of the contingency factors that introduce uncertainty and challenges to organizations. Social structures and hierarchy of power were proposed as examples of the strategies to deal with this type of uncertainty. The theory promotes an organization's efforts to increase its output by minimizing internal and environment factors that affect performance. When relating contingency theory to organizational theory, it is observed that there is a definite desirable method of strategizing and organizing an enterprise, establishing leadership or making decisions because one organization's effective theory, leadership or decision-making techniques may not produce the same results for another (Fiss, Marx, & Cambré, 2013). Some factors that affect organizational theory include a firm's adaptation to the environment, the contrasts between operational activities, and the company's resources and size of the enterprise.

2.3. Risk management concepts

2.3.1. Risk Management

Risk management is the process of measuring uncertainties and identifying opportunities and threats faced by organizations (Zadeh, 2010). The Risk Management (RM) process involves identification, evaluation, and mitigation of risks. The primary role of RM is to utilize resources to control the occurrence of a threat or reduce its impact on output of the organization (Wu & Olson, 2015). Risk management seeks to enable management to deal with the risks and difficulties that an organization is exposed to, which may contribute to hindering its strategic path (Tufano, 2011). Risk management is an essential part of any organization's strategic management, which an organization

www.manaraa.com

systematically pursues to address the risks associated with its activities (Ruzic-Dimitrijevic & Dakic, 2014).

During and after World War II, the concepts of RM emerged in the insurance industry to cover for accidents in the 1950s. Towards the late 70s and 80s, the scope expanded to include threats within the financial sector including market insurance and the advancement of credit to clients by banks (Simona, 2014; Dionne, 2013). The traditional approach to RM started as a way to cover business from being affected by accidents such as fires, storms, tsunamis, and hurricanes, which cause losses to organizations when they occur (Simona, 2014).

The driving force for the evolution process was the need to increase governance of RM through reduction of regulatory capital associated with unanticipated risks (Dionne, 2013). In the 90s, the traditional risk management (TRM) model expanded to include risks affecting the strategies and operations of the organization (Layton, 2007). The model faces a limitation in its application to business investments due to the silo-based approach, which emphasizes that each department deal with its risks individually (Layton, 2007). TRM limits top management from having the correct perspective of the threats against the organization as an entity. Until recently, risk management looked at the productivity-related research, but then the concept of risk widened to encompass those dimensions associated with individuals or those associated with irrational behavior within an organization (Paape & Spekle, 2011).

2.3.2. Enterprise Risk Management

In the 1990s, enterprise risk management (ERM) became a critical process because of the increased losses due to the complex and dynamic environment in which institutions

www.manaraa.com

operated (Setapa et al., 2015). The Harvard Business Review (2004) considered ERM as a breakthrough management approach that operates in functional silos to manage risks. ERM focuses on capturing the full range of risks and the various interdependencies between them. ERM ensures the ability to identify risks, assess risks, and identify ways to overcome them (Paape & Spekle, 2011).

Scholars often define ERM in similar ways, for instance Setapa et al. (2015) view it as a process in which risk is identified, assessed, and overcome. Similarly, Lam (2006) defined ERM as an organization's process for risk assessment, risk control, and risk management to raise the institutional value of the organization. ERM is a control measure for managing threats facing businesses through an integrated and systematic approach involving board supervisions and identification, evaluation, and responding to corporate risks (Olson & Wu, 2015). ERM is a systematic approach that is applied across the organization (Rodriguez, 2010).

ERM aims to support the organization in achieving its strategic objectives by developing a particular approach to identify, assess, prioritize and monitor risk in an organization as a whole (Dickinson, 2001). ERM is a way to ensure the sustainability of an organization's work, enabling it to achieve its organizational objectives (Lam, 2003). ERM contributes to reducing sudden risks, identifying opportunities and sustaining its services (Abrams et al., 2007). The main stages that represent ERM process are risk identification, risk analysis, risk response and risk monitoring. ERM contributes to reducing the likelihood of undesirable sudden events and facilitating the decision-making process (Zadeh, 2010). Boards contribute to the strategic objectives to enhance oversight responsibilities for the

www.manaraa.com

management of an organization, the appointment of personnel, and the performance of an organization within ERM (Olson & Wu, 2015, 2015).

A survey of audit and RM conducted by Gates et al. (2012) reveals that firms embracing ERM experience increased efficiency in making informed business decisions, and greater accountability while improving the communication processes about taking risks. The significance of including corporate risk in a single ERM concept is that a business can develop long-term goals to maintain a competitive advantage in the market.

As a discipline, ERM entails the practices in an enterprise which involve monitoring, analysis, and the control of risks which inform the optimization of risk-taking behaviors through a portfolio, after establishing the relationship between the threat to a process and the return to investment (Farrell & Gallagher, 2014). The ERM approach is critical, therefore, to improve the close monitoring of the actions which a company takes, hence avoiding losses to businesses in addition to traditional methods of internal control, such as financial reporting, to avoid losing fiscal resources through fraud.

In value creation, past studies indicated that ERM worked best in imperfect capital markets through reduction or by creating opportunities involving taxes; agency and bankruptcy costs; and expenditures in the external capital of a company (Grace, Leverty, Phillips, & Shimpi, 2014). ERM processes aim at creating a risk portfolio designed for the improvement of internal, operational, strategic, and capital structure decisions, as well as efficiency in the allocation of resources to risky investments (Grace et al., 2014). A holistic approach to the management of threats facing an enterprise, rather than a unit, improves the decision effectiveness and performance of the firm.

www.manaraa.com

2.3.3. Enterprise and Traditional Risk Management Processes

ERM is an approach that was developed to improve on the challenges and failures of traditional RM (TRM), which is considered silo-based (McShane, Nair & Rustambekov, 2011). One of the improvements is that ERM focuses on the identification of the relationships between risks and how to manage them holistically in a single portfolio, unlike the earlier approach which reacted to one threat at a time (Grace et al., 2014).

ERM builds on TRM's limitations by approaching RM comprehensively to manage risk from the top (Lundqvist, 2015). The board and personnel in top-level positions of a company are responsible for creating a committee, which spearheads a holistic analysis and interpretation of the threats that affect the performance of the firm (Layton, 2007). ERM aims to enhance an organization's ability to reach its overall objectives by implementing senior leadership practices to manage risk (The Committee of Sponsoring Organizations COSO, 2004). The decision-making process is guided by the nature of ERM's applicability to investments, as well as by the evaluation of internal and external environments (Lundqvist, 2015).

Table 2. 1. Comparison between ERM and TRM

TRM	ERM
Uses a holistic approach to identify risks affecting the organization	Identifies risks associated with a particular department
Decisions are made within departmental management	The board makes decisions from the top regarding RM
The objective is to prevent the occurrence of losses within a unit in the company	Focuses on lowering the risk, increasing profits, and creating value for the organization through risk intelligence
The management of uncertainties is mostly based on tangible and financial assets	ERM creates a holistic risk portfolio of both tangible and intangible assets such as employees, innovation plans, and clients

www.manaraa.com

ERM includes the utilization of intelligence-based threat assessment which focuses on the identification of risks that an organization can undertake to create value, grow profits, or have leverage in the market (RIMS, 2011). The process is, therefore, instituted within the culture of the company and enhances optimization of operations including resource allocation decisions by top management (Simona, 2014).

Table 2.1 details the contrasting characteristics between ERM and TRM based on four elements, which include: the level of management, nature of decision-making, primary objectives, and the risk portfolio. In the traditional approach, managers within the department make decisions on the RM involving threats that affect the department only, thus making it difficult for top administrators of the organization (Lundqvist, 2015). However, in ERM, the management and board assess the risks of all departments to form one portfolio that guides decisions (Butterfield, 2017).

2.3.4. Enterprise Risk Management Frameworks and Standards

The most widely used frameworks for ERM that the majority of international corporations use, including higher educational organizations, are COSO: 2004 – Risk Management Integrated Framework and ISO 31000 Risk Management - Principles and Guidelines (RIMS, 2011). Both the COSO ERM (see Figure2.1) and ISO 31000 (see Figure 2.2) represent holistic approaches that enable organizations to apply generic risk management practices (Gjerdrum & Peter 2011). However, ISO 31000 focuses on the application and the administrative parts of the process. ISO 31000 is a simpler and easier framework than the COSO model, which is more complex and multilayered (Padro, 2015). Whereas COSO focuses on the effectiveness of procedures and processes, ISO 31000 enhances the achievement of set goals through the application of specific standards of the

www.manaraa.com

sector (Dali & Lajtha, 2012; COSO, 2012). ISO 31000 emphasizes the importance of the identification of risk owners and continuous education about risks to increase accountability.

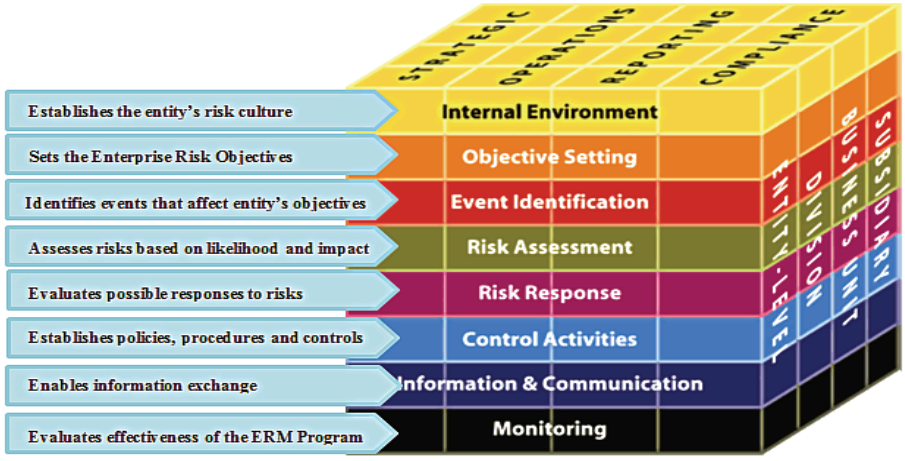


Figure 2. 1 The COSO ERM framework

The ISO 31000 is divided into three main sections: The principles, framework and process. The ISO 31000 includes 60 standards to link the performance of the organization to the service quality and achievement (AIRMIC & Irm, 2010). Each standard explains how an enterprise should precede creating, implementing, and keeping the RM process updated and applicable (Purdy, 2010). The rationale for preferring the ISO 31000 ERM framework in universities and colleges is that ISO 31000 is simpler and easier to follow compared to the COSO model, which is more complex and multilayered (Padro, 2015). The framework section of the ISO standard is aligned with the action research process and the methodology that will be followed to conduct this research.

www.manaraa.com

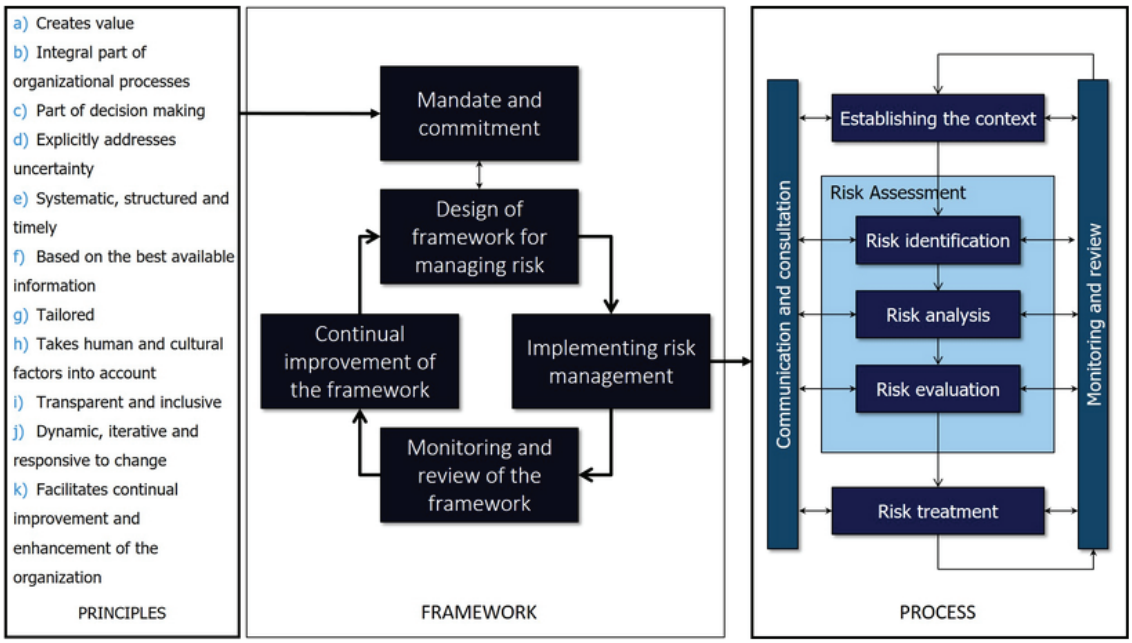


Figure 2. 2 ISO 31000: 2009 framework

The central component of the ERM process according to ISO 13000 is risk assessment, which is a process that involves three main phases: risk identification, analysis, and evaluation. Risk assessment is a continuous process that focuses on the internal and external business environment to facilitate risk control. The process comprises of documentation and communication of concerns while assessing effective risk factors related to the project goals (Maguire, 2002). It is a continuous process that focuses on the internal and external business environment to facilitate risk control. The process can be improved through the application of philosophies, such as a hierarchical-risk breakdown structure and a sharable knowledge–driven approach to improve the knowledge repository, thus supporting an RM framework. The lack of a communication tool, however, could result in the ineffectiveness of RM because risk information is not relayed to the relevant operational units (Tah & Carr, 2001).

www.manaraa.com

Another component is risk monitoring that involves the identification, analysis, and planning for emerging risks while evaluating the already identified ones on the watch list. KM ensures that all the assessment procedures are adequate and that the control strategies are efficient (Tah & Carr, 2001). Any deviation from the set standards results in re-evaluation and development of better handling strategies.

The communication and consultation within the ISO 31000 model involves identifying the internal and appropriate external stakeholders of risk throughout the organization (Gjerdrum & Peter, 2011). Communication and consultation are continuous processes where relative, accurate and up-to-date information and feedback are accessible throughout the enterprise. ISO 31000 suggests that, most of the time, cross-functional risks are managed by multiple people or multiple departments. With ERM, the organization needs to create a sense of inclusion and risk-aware culture among the key stakeholders in order to manage risks successfully.

2.3.5. Factors Affecting ERM Implementation and Improvement

The factors that influence an organization's process of implementing or improving ERM practices include the board of directors, firm size, the regulatory and internal environment, the level of ownership in a company, as well as the frequency of risk evaluation and reporting (Paape & Spekle, 2012; Nocco & Stulz, 2006; Gatzert & Martin, 2015). In some organizations, the reluctance of boards and management personnel to integrate ERM fully into the processes reduces accountability and the making of informed decisions (Gates et al., 2012). Empirical evidence indicates that ownership structures affect the implementation of ERM because it bears a great impact on the business value and operations of the shareholders (Gatzert & Martin, 2015; Paape & Spekle, 2012). Regulatory

www.manaraa.com

frameworks, such as interest rates, and the internal environment involving leverage, dividends, and frequency of risk assessments determine the choice of ERM framework and compliance level (Nocco & Stulz, 2006; Lundqvist, 2015; Beasley et al., 2005). The policymakers, holders, owners and top management influence the acceptance, use, and implementation of ERM, and their commitment is seen as key for ERM success (Baxter et al., 2013).

2.3.6. Enterprise Risk Management in Higher Education

A higher education organization appears as an organized social and administrative unit composed of a group of individuals who have an established relationship with each other and a clear and coordinated organizational structure, where everyone is trying to achieve its specific objectives through its interaction with the surrounding environment. Any university in its academic nature is in relation to other social institutions, so it works to maintain the prevailing social values. This social nature of the university results in a set of values and behaviors that can lead to the emergence of complex risks such as conflict and competition, student violence, the deterioration of scientific research, funding risks and many others (Reddy et al, 2007).

The Higher Education Funding Council for England (HEFCE) has found that health and safety hazards, financial risks, strategic risks, IT risks, and student risks are the most significant risks identified in higher educational institutions (HEFCE, 2001). The identified higher education risks may severely affect academic reputation and the financial status of a university (Reddy et al, 2007). Rodrigues and Edwards (2014) emphasized that all these risks need proper management to control and overcome them.

www.manaraa.com

In 2008 and 2013, two surveys to identify the maturity level of ERM practices in higher education institutions were conducted by the Association of Governing Boards of Universities and Colleges (AGB) and United Educators (UE). The results indicated that universities do not attempt to apply ERM practices despite the increased risks in these educational institutions. A comparison of the results of the 2008 and 2013 surveys showed that the percentage of respondents who believed that risk management in universities was an essential part of the university culture was 47% in 2008 while this percentage decreased in 2013 to 31%. In the 2008 survey, 39% of respondents said that their institutions had applied the principles of ERM in their universities in the last two years.The 2013 survey showed that 61% of respondents said that their schools did not utilize any form of RM or that respondents did not have any information on this subject (AGB and UE, 2014). These statistics can be seen as a reflection of the struggle to understand and implement ERM, and the lack of practical knowledge about the ERM process in higher education.

Jalal et al.'s (2011) study concluded that institutions are aware of the importance of ERM but do not have the appropriate knowledge to use and employ ERM's practices. Several studies have indicated that the application of ERM in organizations and institutions, especially educational ones, remains a recent issue and has not yet reached the required level (Sabato, 2009; Shafiq & Nasir, 2010; Zadeh, 2010; Jalal et al., 2011; Setapa et al., 2015). A study conducted at North Carolina State University found that 60% of respondents agreed that the process of ERM is immature in their university and requires extensive organization and arrangement. Twelve percent of respondents said that the

www.manaraa.com

organization could not find a clear and specific methodology or identified accompanying tools for managing institutional risk (Setapa et al., 2015).

AGB, in collaboration with UE, conducted a survey involving 600 respondents from private universities (77.2%) and public higher educational institutions (22.8%). Their results indicate that cooperation between presidents and boards of universities in the strategic role of overseeing campus risk can increase the achievement of the objectives (AGB, 2009). In the findings, 40% of the respondents from private higher education institutions indicate that management understands risk tolerance and that it guides the decision-making process to drive their institutions' performance (AGB, 2009). The implication is that the top management of public universities and colleges in the US use the COSO and ISO 31000 ERM frameworks less than private institutions.

RM initiatives are underutilized in most US higher education institutions, are poorly assessed and lack effective communication channels to clarify to the community any new and ongoing initiatives by management (AGB, 2007; Padró, 2014). The culture of most universities and colleges involving protection of brand and mission, capital investments, or preference of traditional methods to sustain long-standing tenures can hinder the adoption, implementation or improvement of ERM (Tufano, 2011). The rationale is that the senior management has a low commitment to implement ERM in the achievement of the mission. (AGB, 2007; Tufano, 2011).

Though higher education institutions face the same risks as businesses, such as safety and security, a survey in the sector reveals that the communication breakdown between institutions, personnel and students makes identification of the risks difficult due to little involvement of the stakeholders (Helsloot & Jong, 2006). A survey conducted

www.manaraa.com

across higher education institutions in the Netherlands shows that there is no integrated policy to enhance communication between domains as to risk, which includes safety, crisis management, and security (Helsloot & Jong, 2006). The literature indicates that most higher education organizations integrate ERM frameworks such as COSO and ISO 31000 with their processes (Helsloot & Jong, 2006). However, shared governance structures limit the implementation of the decisions by administrators (Lundquist, 2015).

Based on the uniqueness of higher learning institutions, there is limited research in the US to support adoption and improvement of RM in critical operation processes such as finance and IT application despite the inclusion of courses on the subject (Lundquist, 2015). There is need, therefore, to develop more research on the implementation processes especially to other sectors such as higher education institutions, which face the same risks as those in the business environment, as a way to enhance the output and standards of services offered to the public.

In fact, Tufano (2011) in his study stressed that educational institutions realize the great benefit of implementing the practices of ERM; but they do not have sufficient knowledge of how to manage and deal with it. Shafiq and Nasir (2010) confirmed that the application of ERM in higher education institutions is still at an initial stage and has not yet reached the desired status.

2.4. Knowledge management (KM)

The concept of KM has emerged in recent years not only as an ideology but as a strategy to support institutions in all fields as a competitive advantage and as an important means of avoiding and dealing with risk. Modern management in many organizations has been convinced that the long-term success and survival of the organization includes the

www.manaraa.com

relationship between staff and knowledge, productivity, and how to deal with risks (Jubran & Mansouri, 2015).

The intellectual roots of KM go back to philosophical thinking for one part, and to a focus on the requirements of workplace experience for the other part. Knowledge theory is based primarily on the idea that an organization can dynamically create knowledge through three components of KM, which include knowledge creation processes, which are social processes, knowledge assets for the process of knowledge creation, and the cognitive environment. KM is a collection, creation, or transferring of information on systematic approaches which enhances the flow of communication among individuals and improves the effectiveness of operations in the workplace (Alavi & Leidner, 2001). The role of information exchange is to increase the performance of individuals within an organization. Sharing of knowledge involves the transfer of information from one channel to areas required for use. Thus, the process of KM depends on the sharing of knowledge (Gamble & Blackwell, 2001). Knowledge managers are often seen as key people in the development of systems necessary for sharing knowledge. The use of IT to enhance KM practices results in effective knowledge sharing (Choi, Lee & Yoo, 2010).

KM involves various types of systems like decision support systems, semantic networks, simulation tools, expert systems, groupware, document management systems and collaborative systems (Burnell et al., 2004). The structure and the design of KM systems depend on an organization's needs and goals which then form KM. According to Burnell et al. (1994), contingency theory is an example of theories that could be used to develop a KM system for specific requirements.

www.manaraa.com

KM systems must be designed to generate the necessary knowledge and learning processes, as well as to disseminate knowledge to stakeholders as needed. They also continuously renew and develop knowledge, and seek to find the leadership capable of building the knowledge system, preserving knowledge, storing it in the places allocated to it and facilitating the sharing of knowledge (Jubran & Mansouri, 2015).

2.4.1. Knowledge Management and Organizations

Organizational structure, people, tasks, and technology are all interconnected and part of any change or new implementation within an organization (Leavitt, 1965). The organization's capability to grow and survive is measured by its ability to rapidly respond to change and efficiently control its knowledge resources to achieve the organization goals (Burnell et al., 2004).

Recently, knowledge has become the most critical strategic source in building an organization's competitive advantage and has become the most powerful and influential factor in the success or failure of an organization (Dalkir, 2009). Organizations that invest in acquiring and employing the most accurate, valued and up-to-date information about the current dynamic environment are the most successful and innovative organizations (March & Simon, 1958; Burnell et al., 2004). KM has been seen as the cornerstone of all organizations, as it is the factor that creates the value of an enterprise. Institutions which can develop best practices for KM are those that will have a competitive advantage (Shukla, 2012).

KM systems are implemented and used in an organization to change the organization's collaboration and knowledge sharing culture, to build organizational memory and knowledge infrastructure and to empower the organizational

www.manaraa.com

performance(Devenport & Prusak, 1998). KM is a critical tool in supporting managers in making proactive decisions and avoiding risks (Burnell et al., 2004).

However, the organization and work culture is essential for successful knowledge sharing activities. Organizations can create useful knowledge through KM and make it available to individuals who can use it to enhance organizational performance and effectiveness. Scholars believe that if institutions can strengthen their effective knowledge use, they will realize significant benefits (King, 2009).

Researchers linked organizational learning to KM by implying that the learning occurs by acquiring information and knowledge that improves actions (Fiol & Lyles, 1985, p. 803). Learning in an organization is explained by four concepts: knowledge acquisition, information disruption, information interpretation and organizational memory (Huber, 1991). While organizational learning focuses on the process of creating and being a custodian of knowledge, KM deals with the content which institutions develop and uses the information to improve their performance (King, 2009). Even though it deals with the accumulation of knowledge, organizational learning directs a great deal of energy towards the processes needed to revise and create knowledge.

2.4.2. Knowledge Management Process

Firms utilize KM as a strategy to enhance competitiveness in the market. KM seeks to relate human resources with organizational culture by developing avenues for sharing knowledge, such as focus groups. Various scholars have come up with different KM processes that are similar in their core and main functionalities. Holsapple and Joshi's (1997) process contains six steps: acquiring, selecting, internalizing, using, generating and externalizing knowledge. Davenport and Prusak's (1998) processes include knowledge

www.manaraa.com

generation, codification, transfer and knowledge roles and skills. Hall and Cegielski's (2008) process provides very similar steps: creation, storage, transfer, application, and knowledge roles and skills. Furthermore, Rollet (2003) also provides the steps of knowledge planning, creating, integrating, organizing, transferring, maintaining, and assessment.

Finally, the KM framework developed by Alavi and Leidner (2001) consists of four processes which include creating, storing, transferring and applying knowledge help in analyzing and discussing the aim of IT in the management of organizational information (Alavi & Leidner, 2001). Their processes are summarized in Table 2.2.

Knowledge creation is the process that entails the development of new content or the replacement of existing information. Knowledge creation is a combination of social, collaborative and cognitive processes (Peachey, Hall & Cegielski, 2008). There are four modes of knowledge creation identified as the critical facets of the process. These are socialization, combination, externalization, and internationalization (Alavi & Leidner, 2001). The modes either contribute to or depend on each other for effective knowledge creation.

Knowledge storage is the process of ensuring knowledge, also known as organizational memory, resides in various storage components such as electronic databases and written materials. Organizational memory has two components: semantic and episodic (Alavi & Leidner, 2001). Organizations need to store information acquired for future utilization since research reveals that organizations can forget after long periods of not using it (Peachey, Hall & Cegielski, 2008). Semantic memory comprises general

www.manaraa.com

information, such as annual reports, while episodic refers to knowledge that is specific in content, such as institutional decisions.

Knowledge transfer is a communication process. The channels that facilitate the transfer of knowledge can either be formal or informal (Davenport & Prusak, 1998). Informal channels help in enhancing socialization through meetings and seminars while formal channels include memos and letters. Organizations have different sections, which are all in need of knowledge for effective operations. Thus, knowledge transfer remains a critical process as it facilitates the exchange of knowledge from one point to another where it can be used (Rollet, 2003).

Knowledge application is the process involving the individual abilities to trace, gain access to and utilize content saved either in formal or informal storage systems (Alavi & Leidner, 2001). Even though challenges often arise in the application of knowledge in daily routines, IT has a positive influence on the process through integration of information (Choi, Lee & Yoo, 2010). Institutions apply knowledge in their daily operations to enhance the decision making process, and increase efficiency, and competitiveness.

Table 2. 2 Knowledge Management Steps (Alavi and Leidner, 2001).

Creation	Storage	Transfer	Application
Data extraction	Knowledge repositories	Systems developed by experts	Systems developed by experts
Learning	Databases	Discussion forums	Workflow systems
Focus groups	Individual memory	Directories	Workflow automation

Table 2.2 shows all the steps of managing knowledge and its features. The creation of knowledge is effected through the extraction of data and converting them into information (Alavi & Leidner, 2001). Through focus groups and seminars, new information is created. The information can also be stored in repositories, electronic systems and in

www.manaraa.com

individual memories (Choi, Lee & Yoo, 2010). The transfer of knowledge can happen through the systems developed by experts and during discussion forums. Finally, the application of knowledge is effected through workflow systems and the systems developed by experts.

2.4.3. Knowledge Management and Higher Education

With the growing globalization, KM is becoming the center of all integration processes. Currently, knowledge has become the backbone of every institution of learning (Rowley, 2000). Through KM, technologies have been developed in colleges and universities to aid in globalization and integration (Cranfield & Taylor, 2008). Higher education organizations have grown more complex than before as a result of its accommodative nature.

As people from diverse backgrounds and cultures join institutions, KM application becomes increasingly difficult (Cranfield & Taylor, 2008). Yet, higher education institutions are among the last to implement KM. Higher education should shift its attention from knowledge hoarding to KM in order to enhance its activities and foster innovation (Brewer & Brewer, 2010). Universities aiming at meeting the needs of the dynamic environment must develop KM and human resource management strategies (Brewer & Brewer, 2010). KM is a powerful management tool and institutions should tap into this potential to enhance their administrative and research work.

Past studies have emphasized that the adoption of KM in organizations leads to many benefits (Levine, 2004; Abrams et al., 2007; Dalkir, 2009; Al-Zatma, 2011; Tufano, 2011). For instance, it increases efficiency and effectiveness, improves performance, increases productivity, improves creativity, and responds rapidly to surrounding changes.

www.manaraa.com

Adopting KM strategies and techniques in higher education institutions is considered as vital and important as in the business sector, and if KM has been implemented effectively, it will improve the ability of educational institutions to make decisions (Kidwell et al., 2000).

2.5. Knowledge management and ERM

2.5.1. The Relationship between ERM and Use of Information Technology

Over the past two decades, there have been many dramatic and rapid changes in the direction of informatics and technology that have exceeded the changes that the world has undergone over the past centuries (Al-Zatma, 2011). These dramatic changes have contributed to increasing risks and threats. Higher education institutions were not far from these risks and were subjected to many transformations and rapid changes, foremost of which is the technological and technical revolution (King, 2009). This revolution depends on advanced scientific knowledge and optimal use of information resulting from the tremendous increase in computer technologies and the global telecommunications network (Abrams et al., 2007).

Internal auditors face challenges in managing risks since they are required to learn and understand information technology and the impact it has on risk management. Auditors can increase business value by embracing IT to support the successful implementation of ERM programs (Alhawari et al., 2012). The increasing role of ERM in the environment has forced auditors to utilize a more risk-focused approach to daily transactions and decisions (Karadsheh et al., 2008). IT is at the center of new ideas through innovation, and institutions must invest heavily in IT infrastructure to efficiently control risks associated with globalization (Alhawari et al., 2012).

www.manaraa.com

IT is critical in giving timely data, which helps in the identification, analysis, and response to risks (Rodriguez and Edwards, 2008). Also, information technology creates speed in the operations by ensuring that information is transferred to the relevant operational units efficiently (Alhawari et al., 2012). IT allows auditors to monitor the impact of risks and design appropriate risk management techniques to alleviate possible losses. IT is an asset to institutions focusing on risk management though firms have to realize the types of risks arising from the implementation of information technology. Technology allows firms to integrate financial and operational information processing (Karadsheh et al., 2008).

2.5.2. Risk Knowledge Management

The primary objective of KM is to produce, distribute and use knowledge. Therefore, specialized knowledge may be created to deal with risks, be they present or future risks. Knowledge here means the ability to act in the best possible ways to produce better decisions to deal with risks. Rodrigues and Edwards (2014) stressed that the development of KM to the holistic view of ERM needs to overcome barriers between regulatory silos and the exchange of knowledge in various risk management areas. They added that risk management and KM had been studied almost separately. Rodriguez (2010) indicated that KM utilization in risk management had not received sufficient attention. The few studies that attempted to investigate the relationship between KM and ERM were conducted in financial institutions or IT projects (Rodriguez, 2010; Alhawari, Karadsheh, Nehari, Talet, and Mansour, 2012; Rodrigues & Edwards, 2014).

Three core principles of KM have been identified to be related to risk management, which include business focus, operational support, and accountability (Talet and Talet,

www.manaraa.com

2014; Caldwell, 2008). The principle of business focus involves the use of knowledge to develop business goals and objectives. KM is seen as a tool that allows institutions to identify and align different operations with set goals and objectives. Knowledge also helps in ensuring that all functions of management are fully operational and responsible for all the decisions made at each management level (Rowley, 2000). The principles applied to RM offer risk intelligence across organizations. The principle of business focus outlines five critical steps of risk management. The initial phase involves identifying key business risks; next is giving priority to the risks based on their effect on an organization's strategy. The third step consists of the identification of information sources for areas with high risks (Maguire, 2002). Next is the identification of the origins of information critical in establishing crucial business processes. The final step involves the establishment of risk mitigation strategies. The principle of accountability requires managers to sustain sources of information while operational support seeks to obtain the value (Gates et al., 2012). An efficient RM rests upon an effective and continuous sharing of information across operational units.

In addition, Rodriguez and Edwards (2014) stated that the application of KM leads to greater control over risk. Rodriguez (2010) conducted a study to reveal the relationship between KM and two other variables, which are the perceived quality of risk control and the perceived value of ERM. The study found that there is a difference in the extent of the impact of KM on both variables because the two concepts differ from each other. The results of the study confirmed that the application of KM leads to greater control over risks. It also concluded that the relationship between KM variables and the perceived value of

www.manaraa.com

ERM is not clear due to the low performance of models that have tried to explain this relationship.

Projects fail at the implementation stage due to inadequate risk control techniques or to obtaining the right knowledge at the wrong time. Risk identification is a continuous process that focuses on the internal and external business environment to facilitate risk control. The process comprises the documentation and communication of concerns while assessing effective risk factors related to project goals. Lack of KM as a communication tool could result in the ineffectiveness of RM since risk information is not relayed to relevant operational units (Maguire, 2002). The identification of risks allows managers to seek the knowledge required to control the business risks through regulation and monitoring evaluation.

Risk analysis helps in the assessment of potential impact and in the likelihood of the occurrence of a threat, as well as the transformation of risk data into information required in decision-making (Maguire, 2002). In a study by Marshall et al. (1996), three causes for unsuccessful RM in organizations were discovered, which include ineffective controls of systems, a dysfunctional culture and lack of managing knowledge within the entity. The findings of the research indicate that KM is a critical structured approach to the decision makers because it enables access and transfer, as well as generating and testing of new information/knowledge to address changes in a firm's RM (Marshall et al., 1996). KM improves the conceptualization and characterization of the threats or uncertainties which relate to a particular risk, hence improving the uncertainty analysis in an institution (Aven, 2018). The risk assessment process can be improved through application of KM philosophies such as the hierarchical risk breakdown structure and a sharable knowledge–

www.manaraa.com

driven approach to improve the knowledge repository that supports a RM framework (Tah & Carr, 2001).

The monitoring of risks involves the identification, analysis, and planning for emerging risks while also assessing those already identified. KM ensures that all the assessment procedures are adequate and that the control strategies are efficient (Tah & Carr, 2001). Any deviation from the set standards results in re-evaluation and in the development of better handling strategies. KM provides information for altering current plans found to be ineffective. KM aims to assess and give updates on the position of risk, review the efficiency of risk treatment, and identify new threats and their origin.

2.5.3. Risk Knowledge Sharing and Organizational Change

Organizational culture varies from one organization to another. Even in organizations that support knowledge sharing, there is resistance from individuals who are not comfortable sharing information (McDermott & O'Dell, 2001). In institutions where information sharing is the norm, individuals share ideas without the feeling of being forced to share information. The variation in core values also affects risk knowledge sharing in institutions. Some organizations share core values across the entire business and others within a particular operational unit (McDermott & O'Dell, 2001). Organizational risks are quite unpredictable, and management needs to prepare for any eventuality through risk management tools.

Risk knowledge sharing provides organizations with the required information and the techniques for risk identification and monitoring (Rodriguez & Edwards, 2010). However, very little research discusses the relationship between RM and KM especially in regard to changing the organizational silos/departments approaches to managing threats

www.manaraa.com

(Rodriguez & Edwards, 2010). Based on the survey by Rodriguez and Edwards (2010) involving 121 respondents, constant sharing of risk information offers a broad approach to challenges as individuals get involved in risk management processes. Sharing information leads to the creation of new ideas, thus improving decision-making processes (Alhawari et al., 2012). Effective organizational risk management requires input from all parties, and the process is achieved through information sharing (Rodriguez & Edwards, 2010).

Knowledge sharing is proposed to equip the board of directors, senior management, staff, and stakeholders of an organization with the right information regarding the risks that have been identified and those with a high probability of occurring. KM identifies risks through warning signals thus allowing firms to conduct corrective measures and also prevent a repeat of similar threats. Further, IT will enable firms to monitor their activities carefully in order to meet set objectives through the identification of unachieved deliverables, and the cause of the failure for appropriate control mechanisms (de Bakker, Boonstra, & Wortmann, 2011; Talet & Talet, 2014).

The enhancement of risk knowledge sharing develops institutions' capacities for success. Knowledge sharing through integrated information systems improves risk monitoring by providing the right information needed for risk identification, analysis, and tracking at all levels of management. However, the development of a risk sharing culture relies on the capability of individuals to share information and the presence of an environment to create and share solutions (McDermott and O'Dell, 2001).

2.5.4. The Relationship between ERM and IT/KM in Higher Education

Globalization and recent technological and social developments have contributed to increasing risks and threats in all types of organization. As I discussed above, higher

www.manaraa.com

education institutions were not far from these risks and were subjected to many transformations and rapid changes, foremost of which is the technological and technical revolution (King, Marginson & Naidoo, 2011).

Higher education institutions realize the great benefit of implementing the practices of ERM; but they do not have sufficient knowledge to know how to manage and deal with it (Tufano, 2011). The application of ERM in higher education institutions is still at an initial stage and has not yet reached the desired status (Shafiq & Nasir, 2010). Rodriguez (2010) concluded that the use of KM for ERM has not yet received adequate attention, and he added that past research, which dealt with studying KM to handle the issue of ERM, was not applied in higher education institutions although it was applied in financial institutions.

The implementation of ERM systems in higher educational establishments will identify, control, and reduce key risks facing these institutions, and ultimately contribute to achieving the highest indicators of success (Tufano, 2011). According to Abrams et al. (2007), risk management information systems (RMIS) must be based on a particular technological structure. Levine (2004) indicated that the design of a risk management information system included a fundamental challenge, which is the need to design a system that is consistent with the overall vision of the organization. There is a need to increase the use of KM to be able to keep up with developments and continuous changes (Abrams et al., 2007). KM is proposed to help organizations in sharing risk information on a regular basis and creating risk-focused organizational culture (Rowley, 2000). The exposure of employees to risk information equips them with skills to identify, analyze and control risks. Through information sharing, boards, presidents, and CFOs, can re-focus on their

www.manaraa.com

management strategies and enhance risk management (de Bakker, Boonstra, & Wortmann, 2011).

The discussion of ERM at higher education institutions coupled with discovering the relationship between KM and ERM is a worthy subject of study and attention. Most previous work did not combine the two concepts in one study. Instead, researchers studied each concept separately or examined the impact of one of these factors on other variables, such as quality and competitive advantage (Tufano, 2011; Ruzic-Dimitrijevic & Dakic, 2014; Ariff et al., 2014; Setapa et al., 2015). The main discussion of these concepts was investigated in industrial and economic institutions in particular (Rasid & Rahman, 2009; Shafiq & Nasir, 2010; Daud, 2011; Razali et al., 2011; Jalal et al., 2011). Therefore, examining these concepts in the higher education sector increases the importance of this study.

www.manaraa.com

CHAPTER THREE: METHODOLOGY

The action research approach has been used recently in the field of information systems (IS). This researcher used the Action Research (AR) approach because it represents an ideal research method for validating and possibly refining the KM role and requirements to advance ERM capabilities. AR indicates that the organization can be understood if the researcher was a part of the operation of the problem and the solution. The researcher could participate in achieving the changes that contribute to improving the organization's performance (Davison, Martinsons & Kock, 2004).

3.1. Action Research Background

The aim of the research is to assist in causing social change and theory progress (Feldman, 2017). Action research is applied in IT to achieve the following goals: identifying designers and IT planners who can help in research projects, and involving participants in meetings and discussions (Kemmis, McTaggart and Nixon, 2014). Another goal is to collect required information through listening and observing. Additionally, the researcher collects relevant data to draw required conclusions. Finally, the results of action research are published featuring both theoretical and practical results. The importance of action research is the use of theory to assist company managers and IT officers in coming up with investigative projects to enhance organizational practices, systems, policies and operations (Herr and Anderson, 2014). Therefore, action research bridges the gap between practice and theory by enabling its members to gain knowledge related to their organization's field. Moreover, action research provides the foundation for personnel empowerment and creates an opportunity for IT practitioners to evaluate their operations and formulate self-improvement mechanisms (McNiff, 2016).

www.manaraa.com

The different types of action research identified in the literature differ from each other by key features such as the process, whether its iterative, reflective or linear; or the researcher's involvement, whether its collaborative, facilitative or experimental in role (Baskerville and Wood- Harper, 1998).

There are many examples, methods, and structures of action research that have been discussed in the literature such as Canonical Action Research, Critical Action Research, Action Science, Soft Systems Methodology, Multiview Method, and Participatory Action Research. Canonical Action Research addresses current issues and implements scholarly research in improving business performance. It involves planning, assessing and diagnosing of the vital projects required for the process of organizational change. Critical Action Research is a method that is influenced by power imbalances in an organization, which can be reduced through redeeming impact. Action Science is designed to help solve organizational issues by pointing out the contrasts between the espoused theory and the one being used by the company. Soft Systems Methodology helps identify and solve problems in an organization through use of well-structured and researched procedures. The aim of the Multiview Method is to identify and improve the organization's situation through the implementation of a network information system and development structures. In Participatory Action Research, the business client is given the opportunity to actively participate in data analysis and evaluation of the learning processes (McNiff, 2016; Baskerville and Wood- Harper, 1998).

In general, all types of action research promote collaboration between the researcher and other individuals in the organization where the study is being applied.

www.manaraa.com

Action research aims to help the organization solve existing problems to improve its performance, productivity, and services (Baskerville and Pries-Heje, 1999)

The fundamental requirement for action research is that making changes and monitoring the impact of these changes represent the basic path to study a social process. Baskerville and Pries-Heje (1999) stressed that the researchers' job in action research is not limited to observing the phenomenon; rather, they participate in studying this phenomenon, and revealing its effects. The majority of AR, including the Canonical Action Research method, is used to both improve organizational issues and to contribute to the community of knowledge.

In the current study, the researcher will use a particular type of action research, canonical action research (CAR). Davison, Martinsons and Ou (2012) described CAR as:

> Method that bridges the gap between scholars and practitioners by advancing scholarly knowledge as it addresses complex, real-world problems. (p. 83)

CAR is collaborative by nature where both the researchers and the clients work together to solve and understand the problem. CAR is the only type of action research that is iterative, rigorous and collaborative. It focuses on both knowledge generation and enhancing the organization's performance (Davison et al. 2012), which makes CAR an ideal method to be used in this dissertation study.

3.2. Canonical Action Research (CAR)

CAR is applied to enhance organizational processes through inter-relating practical intervention strategies and scholarly work. The four main areas of focus in the CAR process are diagnosis, action planning, action taking and reflection. The sole focus of CAR is solving current organizational issues by applying research from scholarly work to improve

www.manaraa.com

an organization's systems performance. CAR is vital for evaluating an organization's information systems because it utilizes practical intervention strategies. Before applying change to organizational systems, CAR is used for assessing, diagnosing and planning all the important company activities (Davison et al. 2012, McNiff, 2016). The role of a researcher who is applying CAR is to diagnose the issue, strategize to find solutions and evaluate intervention strategies for the right course of action (Maccani, Donnellan, and Helfert, 2015).

The role of theory in CAR is to aid in establishing action steps to be taken. In addition, theory assists in evaluation and assessment of analysis of the intervention strategies applied (Maccani et al. 2015). There are no strict rules on how to utilize theory because it can be analyzed, evaluated and assessed to obtain its reliability coefficient. If a certain theory proves inapplicable for a project, it can be replaced with another that offers detailed insight into the problem and offers applicable solutions for effective results. When a CAR project involves collection and evaluation of huge amounts of information, it is best to assess, question and develop the theory in use.

The two main theories connected to CAR are focal and instrumental theories. Focal theory focuses on the utilization of scholarly work for the formulation of strategies that cause effective organizational change. Focal theory is composed of three other systems namely, strategic behavior theory, annotated equilibrium theory and adaptive composition theory (Davison et al. 2012).

Instrumental theory focuses on the analysis of instrumental organizational structures and the utilization of tools required for the proper application of the focal theory. Instrumental theory is especially important for researchers and their customers

www.manaraa.com

because it enables them to diagnose, assess and plan effective strategies. Instrumental theory is important in CAR because it serves as a mediation point for researchers and clients whereby they come to agreement on a common strategy (Davison et al. 2012).

3.2.1. CAR Overview

According to Davison et al. (2012), the CAR method contains four different principles as follows: The Researcher–Client Agreement (RCA), The Cyclical Process Model (CPM), The Principle of Theory, Change through Action, and Learning through Reflection (see Table 3. 1).

Table 3. 1 CAR Key Principles (Davison et al., 2012)

Key principle	Explanation	Main Criteria for the project
The Researcher–Client Agreement (RCA)	• The RCA is the starting base for an AR project (Foster, 1972). • RCA is used to build trust among the various stakeholders. • RCA requires transfer of knowledge from the researcher to the client on a continuous basis.	• Both parties agree that CAR is the appropriate approach for the situation. • The research focus is clear and explicit. • The client is committed to the project. • The responsibilities of the researchers and the data collection and analysis methods are specified.
The Cyclical Process Model (CPM)	• CPM consists of five stages: diagnosis, planning, intervention, evaluation and reflection. • There are two CPM cycles running in tandem: one addresses the client's problem-solving interests while the other addresses the researcher's scholarly interests.	• The project follows the CPM. • The researcher must perform a diagnosis of the problem. • The action needs to be based on the diagnosis results. • The researcher must reflect on the outcomes of the action. • An explicit decision needs to be made based on the reflection to determine if there is a need for an additional cycle.
The Principle of Theory	• AR without theory is 'not research McKay and Marshall (2001).	• The research activities are directed by theoretical background. • The research uses a theoretically-based model. • The planned intervention is designed based on the model. • The use of theory to evaluate the outcomes of the intervention.

www.manaraa.com

Change through Action	• The main purpose of CAR is to make changes to a current problem. • The lack of change indicates that the action failed to solve the problem.	• Both parties must be willing to solve the problem. • The use of the diagnosis to determine causes of the problems hypothesized and design the actions based on them. • The client approval of the planned actions. • The evaluation of the situation before and after the actions.
Learning through Reflection	• The description of learning is the main outcome in AR (Lau, 1997).	• The researcher's responsibility is to provide a clear and complete report to the client. • The overall research outcomes are considered and reported.

Kemmis and McTaggart (1987) stated that CAR is a systematic process that follows the Cyclical Process Model (CPM). CAR is cycled to allow a continuous structure of professional development. CPM consists of five main phases, including; the diagnosis phase, the planning phase, the action phase (observation), the evaluation phase and the reflection phase (see Figure 3.1). The planning stage includes the development of a solution and action plan based on the results from the diagnosis stage. The action stage involves the actual implementation of the plan. The action should be performed with continuous monitoring and observation. In this stage, there is a wide range of flexibility to change the actions and activities based on the observations and the obstacles to implement the original plan. This process of observation provides the basis for the reflection phase, where the researcher and the client collectively analyze, interpret and draw conclusions about the achievements and identify the path to move forward (Davison et al. 2012; Kemmis and McTaggart, 1987).

www.manaraa.com

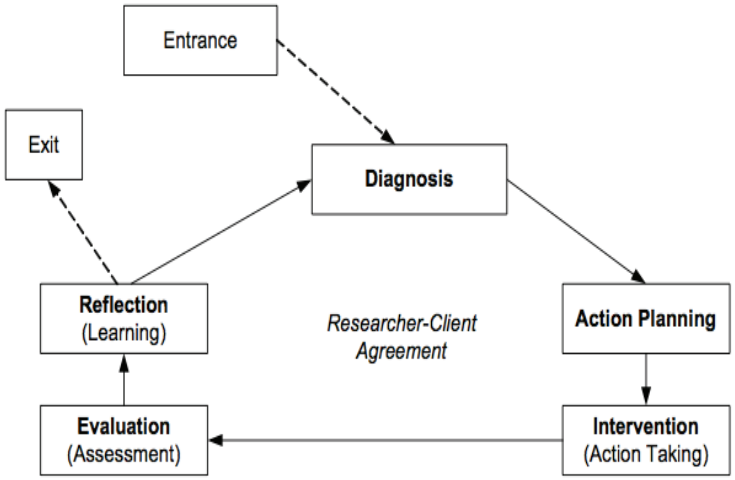


Figure 3. 1 CAR Process Model (Based on Davison et al. 2004)

3.3. The research clients and project setting

The research was conducted at two organizations: Claremont Graduate University (CGU) and The Claremont Colleges Services (TCCS). The organizations in this study both seek to develop their ERM practices and integrate tools and techniques to achieve that goal. The two organizations have very different ERM practices and different maturity levels. These differences allow for a comparative case study to clarify the effect of KM/IT on the development of the ERM process. TCCS started to implement ERM principles in 2011, while CGU started in 2015. CGU and TCCS performed all aspects of ERM manually. Thus, each organization has a very different ERM practice. The only IT-related tool that they were using is Microsoft Excel. They jointly selected and purchased a new tool called Risk Wizard. Risk Wizard has a large range of flexibility and could be customized based on each organization's needs and requirements. The researcher obtained access to both organizations to conduct action research to evaluate the changes and developments that RM/KM might introduce to ERM process. The researcher attended a Risk Wizard training session organized for CGU and TCCS and has administrative/full access to the tool.

www.manaraa.com

The Claremont Colleges Services (TCCS) is the central coordinating and support organization for a cluster of seven independent colleges known as The Claremont Colleges located in Southern California. TCCS sees ERM as an essential and critical component of their operation, and the ERM process has their board's support. The ERM maturity level in TCCS is relatively high. The main practical component of TCCS's ERM is formal meetings held by the ERM committee that contains the risk management staff, and either a representative or the head of each department or risk area. The processes of risks collecting, assessing, monitoring, responding, and evaluating are accomplished through these meetings. The entire ERM process is performed manually and through face-to-face interactions. TCCS believes in the transparency of their ERM process and allows all parts of the organization to have access to risks that TCCS is facing. Regarding IT use, the only technology-related tool that TCCS employed is Excel, which was used to help them organize risk lists and produce heat maps. However, the primary goals that motivated TCCS to choose and employ a KM/RM tool are: to help them reduce the workload on the RM staff, reduce the number of the committee meetings, evaluate the risks more often and contribute to communicating the risk changes with board members. The main requested features of the new tool were the risk sharing functionalities and a user-friendly interface.

Claremont Graduate University (CGU) board members mandated the implementation of an ERM process after CGU's revenue decreased significantly in 2014, including a mistake in allocating financial aid that year. A RM team was formulated and committed to creating an ERM process. In July 2015, CGU practically began to implement ERM policies and procedures and started the risk data collection process. The ERM's process and practices in CGU are different than in TCCS. The primary practical procedure

www.manaraa.com

of CGU's ERM process is confidential face-to-face interviews conducted within every department in the university. The interviewing process begins with the head of the departments and then moves to every staff member working there. By the time that this research started, the first round of the risk collecting process was not yet completed. These procedures cover multiple steps of the ERM process, including risk identification, risk assessment, and risk monitoring.

Regarding IT use, Excel, as well, is the only IT-related tool that CGU is using. The central motives behind the search for a KM/RM tool are the need to obtain a comprehensive risk registry that covers the whole university, reduce the number of interviews in future ERM cycles, automate some parts of the process, and reduce the overhead required to perform the current ERM steps. Finally, the main criteria that guided the selection of the new tool were: a user-friendly interface; an inexpensive tool that covered risk sharing; storing; presenting futures that the university needs; and how many similarly structured universities have used the tool.

3.4. Researcher involvement with the clients

3.4.1. TCCS

The researcher obtained a verbal agreement from TCCS's Vice President of Finance and Administration to conduct the study and work with the staff in their ERM process. The researcher worked and communicated directly with TCCS's risk manager. However, the researcher has limited power and control over the process of transitioning to the new KM tool. This agreement marked the formal entry into the project in TCCS. During the study, the researcher met with the ERM team on a regular basis, conducted interviews before and after the transition to the KM tool, and participated in and observed TCCS's ERM activities.

www.manaraa.com

The researcher attended ERM committee meetings during the time of the study and observed and analyzed the RM activity before and after the use of the tool.

3.4.2. CGU

The researcher obtained a written agreement from CGU to conduct the study and work with them in their ERM process. CGU offered an internship position to the researcher, who had full responsibility to assess, modify and perform the current ERM tasks and the Risk Wizard implementation. This agreement marked the formal entry into the project in CGU. During the research, the researcher worked for CGU as a part-time consultant/employee for the risk management function. In this capacity, the researcher worked directly for CGU's Vice President of Finance and Administration and for the Chair of the Audit Committee of the Board of Trustees. The researcher spent four hours per day working on ERM tasks. The researcher was given full responsibility and access to modify and guide the process of transitioning to the new KM tool. The researcher met with the Vice President monthly to determine her deliverables and exchange feedback. The researcher's tasks included:

- Improve the overall risk management functions at the University.

  Conduct Individual interviews with staff and students to identify risks.
- The configuration of risk management software.
- Train users in the use of risk management software.
- Navigate ERM best practices among peer institutions nationwide.
- Offer support and assistance regarding RM, a Business Continuity Plan, the safety committee and disaster preparation.
- Reporting to the Chair and Audit Committee of the Board of Trustees.

www.manaraa.com

3.5. The current action research overview

The researcher intended to detect the effect of applying the new KM tool on all aspects of the ERM process. The research was conducted as a collaborative partnership between the researcher and the individuals participating in the ERM process. The research proceeded as a cycle of a corporate diagnostic, planning, action, observation, and reflection. The reflection phase is used either to pave the way for additional cycles or to end the project. The following sections will describe the action research conducted at CGU and TCCS.

3.5.1. The Research at TCCS

The research at TCCS consisted of one action research cycle and passed through the five phases of canonical action research (CAR). The researcher performed eight interviews as part of the diagnosis and planning stages. The research participants are the main members of the ERM committee at TCCS and represent TCCS's different departments. The information gained from the data analysis helped the researcher to understand the ideal IT/KM practices that contribute to empowering ERM in similar organizations. The research results and the suggested plan about how to implement the IT/KM system were discussed with the client. The client implemented the tool with minimum control from the researcher. In this phase, the researcher participated in the process and observed the changes resulting from the implementation of the RM/KM tool. The client used the tool for three months before conducting the evaluation phase to assess the effect of the different KM functionalities. The evaluation phase included three interviewees, representing the major users of the system. This phase marked the end of the research at TCCS.

www.manaraa.com

3.5.2. The Research at CGU

The research at CGU consisted of two action research cycles and passed through the five phases of canonical action research (CAR) twice. In the first cycle, the researcher conducted three interviews with the ERM team at that time and attended The University Risk Management and Insurance Association (URMIA) 2017 conference to discuss ERM best practices as part of the diagnostic phase. The first cycle passed through the five phases of the canonical action research (CAR). After the first diagnosis stage, a decision was made to change the ERM process at CGU before any IT/KM intervention. The information gained from the interviews was used to understand the clients' current status. The first cycle focused on modification of the ERM process. The problem diagnosis phase resulted in a proposal to change ERM practices first and customize them based on the suggested ERM best practices in higher education. The researcher proposed the new plan to the Vice President of Finance and Administration and one of CGU's board members. The plan was approved, and the researcher was hired to execute the new plan and run the ERM process for CGU. During and after the implementation of the new ERM process, the researcher met regularly with CGU's top management to evaluate the intervention. After the approval of the new ERM process structures and outcomes, a decision was made to move to the second CAR cycle.

In the second CAR cycle, the researcher conducted 28 interviews with the principle risks owners identified as part of the diagnostic stage in order to explore their experiences and issues with the ERM process. The interviews, as well, were used to examine the nature of the relationship between ERM and KM practices from their perspective. The information gained from the qualitative investigation helped the researcher to understand the nature of

www.manaraa.com

the relationship between KM and ERM and plan for the action phase. The action plan results helped the researcher customize the methodology to automatically perform ERM activities using the KM system called Risk Wizard. The tool used in the action phase was customized based on the interview results and feedback. The action phase included the implementation of the tool and the participants training. In this phase, the researcher observed the changes and events resulting from the implementation of the tool. Tables 3.2, 3.3 and 3.4 summarize the action research stages, the research activities and the theories associated with each stage.

www.manaraa.com

Table 3. 2 Summary of the Action Research at TCCS

AR Stage	Main Activities	Theories and frameworks	Timeline
Problem Diagnosis	- The formal entry into the project. - Discussion with ERM decision-maker and top management. - The researcher conducted comprehensive interviews to understand the problems and needs. - The researcher participated and observed ERM activities. - The researcher identified the issues with the current ERM process.	- Alavi and Leidner (2001) KM framework. - ERM and RM principles. - COSO ERM framework. - KMS success model. - CAR guidelines.	Aug, 2017 – Nov, 2017
Action Planning	- The researcher examined and compared the different approaches for KM implementation. - The researcher analyzed the interview results to examine the ideal action plan for the organization. - The researcher discussed with the client the needed tools, timelines, and implementation strategies based on the results.	- Alavi and Leidner (2001) KM framework. - ERM and RM principles. - COSO ERM framework. - KMS success model - Contingency theory.	Nov, 2017
Intervention	- The researcher participated in and observed ERM activities. - The researcher observed the installation and utilized the tool. - The researcher evaluated the Risk Wizard implementation plan. - The researcher discussed the modification of the ERM process.	- ERM principles. - COSO ERM framework. - Contingency theory.	Dec, 2017 – April, 2018

Evaluation and Reflection	- The researcher planned and conducted a series of one-on-one interviews with ERM staff, board members and risk owners to evaluate the tool and get their reflections.
	- The researcher summarized and reported the information gained via observation which include:
	  - The project final feedback and recommendation
	  - Lessons learned.
	- A decision to exit the research was made.
		- Alavi and Leidner (2001) KM framework.
		- KMS success model.
		- COSO ERM framework.
		- Contingency theory.
			April, 2018 – May, 2018

www.manaraa.com

Table 3. 3 Summary of the Action Research at CGU (First cycle)

AR Stage	Main Activities	Theories and frameworks	Timeline
First cycle: Problem Diagnosis	- The formal entry into the project. - Discussion with ERM decision makers and top management to understand the problems and needs. - The researcher attended the URMIA conference and ERM training and consulted with ERM experts to help identify issues with the current ERM process and identify requirements.	- ERM principles. - ERM frameworks. - KMS success model. - CAR guidelines.	Aug,17 - Oct, 17
First cycle: Action Planning	- Set criteria and decisions to customize Risk Wizard to CGU's needs. - The researcher examined and compared the different approaches for ERM implementation. - The researcher proposed a plan to change the ERM process. - CGU's top management approved the new proposal and gave the researcher complete authority to perform the ERM plan.	- ERM principles. - ERM frameworks. - Contingency theory.	Oct, 2017
First cycle: Intervention	- The researcher and the client identified a new list of risk areas. - The researcher and the client identified a list of risk owners to represent every risk area. - The researcher contacted the risks owners and conducted a new risk assessment round. - The researcher built a new risk registry based on the collected risk information.	- ERM principles. - ERM frameworks. - Contingency theory.	Oct, 2017 – Nov, 2017
First cycle: Evaluation and Reflection	- The researcher discussed the reflections on the new ERM process with the client. - The researcher summarized the information and the project recommendation. - The researcher made a decision to start the second cycle to use the KM system to perform ERM activities.	- Alavi and Leidner (2001) KM framework. - KMS success model. - ERM frameworks. - Contingency theory. - CAR evaluation guidelines.	Nov, 2017

www.manaraa.com

Table 3. 4 Summary of the Action Research at CGU (Second cycle)

AR Stage	Main Activities	Theories and frameworks	Timeline
Second cycle: Problem Diagnosis	- The formal entry into the project. - Discussion with ERM decision-maker and top management. - The researcher conducted 28 interviews with all the risk owners at CGU to understand the problems and needs. - The researcher discussed results and gave feedback to CGU's top management.	- Alavi and Leidner (2001) KM framework. - KMS success model. - ERM frameworks. - CAR guidelines.	Aug, 2017 - Nov, 2017
Second cycle: Action Planning	- A decision was made to change the ERM process at CGU. - Multiple communications and follow up with Risk Wizard developers to customize the tool to CGU's needs. - The researcher examined and compared the different approaches for ERM implementation. - Consult with all stakeholders about the implementation plans and the tool customization.	- Alavi and Leidner (2001) KM framework. - KMS success model. - ERM frameworks. - Contingency theory. - Organizational theories.	Nov, 2017 - Dec, 2017
Second cycle: Intervention	- Install and utilize the tool. - Assign the risk owners to the risks. - Evaluate and adjust Risk Wizard implementation plan. - Update the risk repository and upload it to Risk Wizard. - Train the risk owners and support their use and involvement with the tool.	- ERM principles. - ERM frameworks. - Contingency theory. - Organizational theories.	Dec, 2017– April, 2018
Second cycle: Evaluation and Reflection	- Plan and conduct a series of one-on-one interviews with the system users (top management and risk owners). - Summarize the information gained via observations. - The project's final feedback and recommendation. - Document lessons learned. - Make a decision to exit the research.	- Alavi and Leidner (2001) KM framework. - KMS success model. - ERM frameworks. - Contingency theory. - CAR evaluation guidelines.	April, 2018 – May, 2018

المنارة للاستشارات
www.manaraa.com

3.6. The data collection approach

In order to achieve the study objectives, the researcher used a qualitative approach to collect the research data. The qualitative approach is based mainly on exploration. Creswell (2007) indicated that qualitative research is a model that enables the researcher to develop the details by participating in actual experiments. Qualitative research is built on a social phenomenon that is explored from the perspective of the participants. Leedy and Ormrod (2001) argued that qualitative research is less regulated in the description because it works on constructing modern theories. Creswell (2007) defined qualitative research as an efficient model that happens in the natural environment where the researcher can develop the details by participating in the actual experiences. Williams (2007) stated that qualitative research is based on an inductive method rather than deductive reasoning, where questions are configured, and the researcher must answer them and explain them; this is different from the qualitative research, which involves exploring the relationship between the variables. Williams (2007) clarified that this approach is mainly used in studies, including interviews and case studies.

There are some data collection methods commonly used by action researchers to acquire an in-depth understanding of changes such as surveys, interviews, observations, participation, documents and focus groups (Lewin, 1946; Kemmis and McTaggart, 1988). This research utilized a mix of data collection methods based on the need of every stage of the AR. As part of the study, the researcher participated and observed all ERM activities and the changes within the process in both organizations. At CGU the researcher participated and performed the majority of ERM-related activities such as risk assessments, risk knowledge storage, risk reporting, participating in meetings, etc.

www.manaraa.com

Table 3. 5. Summary of the research data collection methods

Stage	Diagnosis	Action Planning	Intervention	Evaluation	Reflection
Goals	• Identify problems • Setting analysis	• ERM modification • Tool customization	• Implementation • System configuration	• Evaluation of the framework • Data collection • Data analysis	• Lessons learned • Final findings
Data Collecting	• Interviews • Documents analysis • Meetings • Participation • Observations	• Participation • Observations • Literature review	• Consultation • Participation • Observations	• Interviews • Participation	

The researcher, as well, conducted face-to-face semi-structured interviews with the majority of the individuals involved or exposed to ERM process in both organizations. These individuals included, but were not limited to, the RM team, board members, top management representatives, and the directors and deans of different departments. Table 3.5 summarizes the overall data collection strategies used in this study.

Two inquiry cycles in the form of semi-structured interviews were conducted for the purpose of this action research. The researcher designed the semi-structured interviews to collect the research data for both the diagnostic and evaluation stages. The researcher developed interview guides to ensure consistency throughout every interview and allow some flexibility so that the participants could respond to and clarify the emerging themes and ideas as needed. The foundation of the interview guide was designed based on intensive literature review, the research variables and the main interest of the research. The semi-structured interviews investigated the participants' opinions and experience with ERM and how they view the progress of ERM process. (see Appendices 1 and 2). The same interviewer, using identical data collection protocols, conducted all the interviews for this study.

www.manaraa.com

The first interview series was part of the first two phases of the action research: problem diagnosis and action planning. The interviews were planned to explore the different practices and relationships between ERM and KM. The selection of a variety of subjects was intended to represent diverse views about the connection between ERM elements and KM, which is called the triangulation of subjects (Myers 1997).

The first series included 36 interviews that were the primary source of the data collected during diagnosis. The interviews covered all of the individuals involved in Risk Management within both organizations. The researcher reached theoretical saturation early in the data collection process. However, the researcher continued conducting more interviews to ensure proper triangulation of subjects and to discover more information about the subject.

The second interview series was part of the evaluation phase of the action research. The interviews were planned to explore how KM systems, which are the research intervention, changed, fixed, or addressed ERM issues discussed in the first phase. The foundation of the interview guide was designed based on the issues, and the intervention plan emerged from the action-planning phase. The semi-structured interviews investigated the participants' experiences and reflections about the phase. The second interview series included 12 participants from CGU who represent all the members of five out of a total of the eight risk areas within CGU's risk register. Also, the researcher interviewed three participants out of eight ERM committee members as part of the evaluation phase.

3.7. Analysis approach

The researcher utilized the content analysis technique to interpret and discuss the results. This data analysis technique has been defined as a subjective interpretation of the

www.manaraa.com

collected data by providing readers with a thematic, qualitative data analysis technique (Patton, 2002). The obtained qualitative data were analyzed by the use of coding and grouping techniques. The themes of the interview guidelines were identified according to the goal of the research, which is to gain insights about the relationship between ERM and KM in practice and what KM practices are best fitted for the ERM process. During the interviews the participants were questioned about their individual experience, involvement and understanding of the ERM risk management process within their organization. The interview guide was designed to explore their experience with the ERM process, the positive and negative incidences, the barriers encountered and missed opportunities for further improvements. The information gained from each participant was interpreted from the perspective of how KM appeared to be affecting ERM practices. The interviewer transcribed interviews and the scripts were coded. The data was coded into different themes according to the information that emerged from the interviews. These themes categorized the different ERM and KM practices, the relationships and characteristics of information technology, and a KM system that is ideal for ERM at different stages and components.

The researcher summarized all coding results on a large spreadsheet and looked for shared patterns across each of the themes that emerged from the coding (Myers 1997). The themes are a representation of keywords, concepts, topics or ideas that were mentioned multiple times by multiple participants. The thematic coding was performed in multiple iterations of regrouping and categorizing.

www.manaraa.com

CHAPTER FOUR: THE ACTION RESEARCH STORY

4.0 Introduction

This chapter explains the project steps and discusses how action research was used to explore the relationship between ERM and KM. The chapter sections are divided based on the timeline of the project at both organizations. Section 4.1 describes the first action research cycle at CGU, where the ERM was modified and evaluated before the KM intervention. Section 4.2 describes the action research cycle that includes the KM intervention at both TCCS and CGU. The section provides an explanation of the project plan and the steps of every phase of the KM intervention.

4.1. Pre-KM intervention (CGU's first action cycle):

This study uses contingency theory as the approach guiding the action research stages, where the theory supports the belief that every organizational situation is unique and there is no single best approach to managing and operating every situation. An organizational strategy that works in some circumstances may not be as effective in others (Mintzberg, 1979; Van Donk & Molloy, 2008). The researcher's initial evaluation of the problems considered all the possible technological and organizational contingency factors and unique environmental circumstances . In CGU's case, this consideration led to the decision to change the ERM process first to fit ERM best practices and customize it to CGU's needs before any tool could be used. The researcher decided to conduct a pre-KM AR cycle at CGU. This step was needed for preparation of the ERM process at CGU in order to intervene KM. The AR cycle passed through the five phases of the CAR method.

4.1.1. Diagnosis

The formal entry to the project occurred after a meeting with the Vice President of

www.manaraa.com

Finance & Administration/Treasurer at CGU, where she confirmed the need to fix the ERM process and welcomed the research efforts to intervene under her supervision. The researcher started to discuss ERM status with ERM decision makers and top management to understand the problems and needs.

During the first two months, the researcher connected and consulted with several experts in the field of higher education ERM. The experts' feedback was used to influence the new ERM practices and the process modification. In addition, the researcher used ERM literature and standards to understand and guide the design of the ERM process at CGU. During this time, the researcher met repeatedly with the Vice President of Finance and Administration/Treasurer, Assistant VP of Finance & Administration, and the ERM Program Coordinator, who was running the ERM program at that time, to understand and explore the status of the ERM process. Additionally, the researcher met with the Board of Trustees member in charge of ERM to discuss the challenges facing the ERM process at CGU. The researcher observed the majority of ERM-related activities.

As discussed in Chapter Three, the researcher learned that CGU's board members mandated the establishment of an ERM process after a huge loss in 2014. In July 2015, CGU began implementing ERM activities and established ERM risk assessments. However, the ERM team did not complete the first round of risk assessments by the time my research began. As part of the risk assessment process, the ERM team conducted highly confidential interviews with all employees within the targeted departments. The ERM staff made sure all risk owners were made anonymous before any documentation or discussion concerning the risks was initiated.

Through the initial interviews, intensive literature review, experts' opinions,

www.manaraa.com

observations and active participation in the process, the researcher identified the following issues with their initial ERM process:

- The progress of the ERM process and risk assessment at CGU were very slow and resource consuming.
- The risk assessment process was very dependent on interviews only and included almost every employee in each department, which led to delays, a consumption of resources, and lack of focus.
- The ERM focused on local issues within departments and offices while risk assessment concentrated on risks related to the departments and employees' personal feelings instead of focusing on CGU's overall objectives.
- There were a large number of cross-functional risks reoccurring repeatedly in every department within the current risk register. This was due to the nature of the risk assessment that focused on departments instead of risk areas or categories.
- The ERM process was very confidential and centralized, as no one outside the ERM team knew anything about the results of the process.
- There was a lack of understanding on the purpose of ERM activities among CGU's risk owners; in many cases, their only interaction with the process was through the one or two interviews in which they participated.
- The departments owned the risk as a whole instead of assigning portions of the risk-to-risk owners. The ERM team only knew which risk owners identified which kind of risk.

From this diagnosis stage, the researcher concluded that there was a need to change the ERM process before any information technology intervention. Based on the results of the initial

www.manaraa.com

investigation, the researcher collaborated with the research client and agreed on the need to come up with a plan to reform the ERM process.

4.1.2. Action Planning

The researcher believed that a large percentage of the issues identified during the diagnosis was a result of absent communication and information management strategies. This belief led the researcher to hypothesize that the employment of a web-based KM system was best suited to perform the ERM process and automated risk-sharing activities to resolve several problems with the ERM process. However, the contingency theory that the research follows suggests there are many external and internal contingency factors contributing to the solution of each problem. Thus, the researcher investigated other factors that might contribute to advancing the ERM process at CGU.

The researcher attended the URMIA annual conference. The main focus of the conference was to investigate the biggest risks to colleges and universities and lead the top management in these organizations to discover universal risk management best practices. URMIA identifies itself as "an international non-profit educational association serving colleges and universities whose core purpose is to promote the advancement and application of effective risk management principles and practices in institutions of higher education" (URMIA, 2007). In addition, the researcher consulted with a number of experts in ERM within higher education, reviewed ERM best practices, and conducted a literature review on the subject. All of these activities contributed to articulating and structuring the action plan which concluded there was a need to modify and change the current ERM process before incorporating any KM system and exploring the research-working hypothesis.

The proposed action plan had two main goals:1) transforming the process to mirror

www.manaraa.com

ERM best practices in higher education to focus on the organization's higher-level objectives, and 2) preparing CGU's ERM process for the second action research cycle that involved the use of the KM system. The researcher proposed and presented the new plan to both the Vice President of Finance and Administration and one of CGU's Board of Trustees members. The new plan included:

1. Changing CGU's risk register categorization approach and classifying the risks based on risk areas instead of different departments. This was expected to reduce the overlapped risks between departments and allow the ERM process to cover all CGU's risks including an initial list of risk areas (risk register) based on the literature review, the tools provided by ERM experts, best practices and CGU's needs.

2. Changing the types of risks that the ERM process examines to identify and concentrate on more holistic risks that are cross-functional for the majority of the departments, and focus on the objectives of the university. The new risks would target university- and student-related risks more than employees' concerns and feelings. Similarly, the researcher proposed an initial risk register under every risk area based on the literature review, the tools provided by ERM experts, best practices and CGU's needs. The researcher was expecting to alter, delete, or add the risks based on the results from the risk assessments.

3. Assigning risk owners to every risk within the new risk register, who would be responsible for reporting, updating and communicating the risks in the short and long term. The proposed risk owners covered all the risks that CGU is facing and included CGU's top management, board members, directors and managers of different departments, provosts, deans of different schools, etc. The researcher suggested using the first risk assessment round to help finalize the risk owner's list.

www.manaraa.com

4. Conducting a new risk assessment round with the newly identified risk owners to confirm and alter the risk register, evaluate and analyze the risks faced, and confirms their ownership of the risks.

The plan was approved and the researcher was hired to execute the new plan and run the ERM process for CGU, as previously discussed in Chapter Three. This approval marked the beginning of the Intervention phase. Table 4.1 summarizes the list of issues identified through the diagnosis phase and the plans to address these issues.

Table 4.1. Action Plan Summary

Issue	Proposed action	Action cycle
The ERM process at CGU is very slow and resource consuming.	• Assign risk owners to every risk. • Decentralize ERM and sharing the RM tasks among risks owners. • Automate major parts of ERM activities.	First Action cycle Second Action cycle
The ERM process is dependent on face-to-face interviews only.	• Automate major parts of ERM activities.	Second Action cycle
RA includes all employees in each department.	• Identify top and medium management employees only as risk owners.	First Action cycle
RA focuses on local issues within departments and offices.	• Change the type of risks that the ERM process examines to identify and concentrate on more holistic risks.	First Action cycle
Cross-functional risks occur repeatedly under every department.	• Change CGU's risk register categorization approach and classify the risks based on main risk areas instead of different departments. • Give shared ownership and access to the risks that fall under multiple departments.	First Action cycle Second Action cycle
ERM process is very confidential and centralized.	• Decentralize ERM and distribute tasks among risks owners. • Adapt a semi-transparent approach to ERM. • Share related risks with risk owners. • Introduce KM practices to the process. • Automate a major part of ERM activities.	First Action cycle Second Action cycle
Risks are assigned to every department in general.	• Assign specific risk owners and top management supervisors to every risk within departments.	First Action cycle

www.manaraa.com

4.1.3. Intervention

After the researcher and client agreed on the action plan, the researcher met regularly with CGU's top management to evaluate the intervention progress. The researcher used the same information technology tools that the original ERM team was using such as Excel sheets and email communications. The first step was to design and create new risk registers based on CGU needs and ERM best practices. The researcher consulted with ERM experts and gained access to a number of risk registers from similar organizations. The investigation led to a re-categorization of the risks based on risk areas instead of basing them on departments to eliminate many problems with the old risk register. The researcher reviewed CGU's most recent risk register to consider the risks and determine which areas met the ERM new vision.

The researcher designed suggested risk lists based on the literature review, the tools provided by ERM experts and CGU's needs. The list was expected to work as the baseline for new risk assessments and include some of the risks already evaluated, exclude some irrelevant risks and cover other risk areas that had been left out. The new risk areas were targeted to cover the university and student-related risks from the perspective of the university's staff and faculty.

The researcher and the clients met regularly to refine the risk register and remove all duplicate risks and add those risks to the relevant risk areas, with sub-risks to reflect the different units. The new risk areas included disaster preparedness, facilities, academic affairs, advancement, external relations, human resources, information technology, student services, financial risk areas and compliance risk areas. Figure 4.1 presents a screenshot of the initial Excel sheet that was used during this phase.

www.manaraa.com

CLAREMONT GRADUATE UNIVERSITY RISK MANAGEMENT

RISK ASSESSMENT FOR CGU

Risk Area	RISK	Sub-risks	RISK SCORE IMPACT	RISK SCORE LIKELIHOOD	RISK SCORE NET SCORE	risk owner	Responsible department
Facilities area							
	Deferred maintenance						
	Key systems						
	Moving offices						
	Lighting						
	Maintenance and condition						
	Transportation and parking						
Academic Affairs area							
	Faculty conflict of interest						
	Dissertation award						
	Graduation rate\student learning outcome.						
	Academic advisors (professional)						
	Academic handbook (incorrect information)						
	Recruitment						
	Changes at CGU						
	Advancment in research						
	Grant funding, monitoring and reporting						
	IRB (tap Conway)						
	Accreditation						
	Changes to the Website						
	Data Warehouse						
	Data-Reputation						
	School Budgets						
	Frustrated Students						
	Lack of Fellowships						
	Promotion and Tenure						
	Student-Faculty Workload Ratio						
Advancement and External Relations:							
	Alumni relations						
		Alumni database					
		Alumni database access					
		Events risks					
		Alumni information Privacy					
	Call center +						
	Advancement recentralized budget						
	Community relations						
	Special projects						
	Gift planning guide						
	Advertising the social part of the school (tap)						
	Infrastructure for Customer services						
	CGU Brand						
	Social media						
	Campus climate						
	Physical space (dea)						
Human Resources aea							
	Key personnel risks*						
		Financial department					
		IT department					
		Human resources					
		Facilities					
		Academic Affairs					
		Student services					
		Academic affairs					
		Advancement					

Figure 4. 1 A screenshot of the CGU's Excel sheet

www.manaraa.com

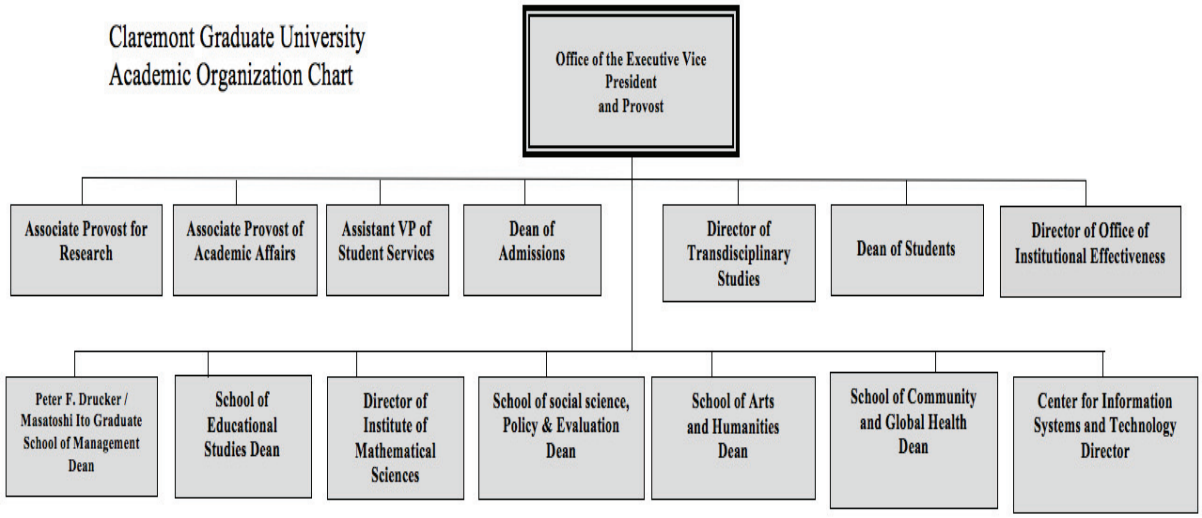


Figure 4.2 Academic risk owners

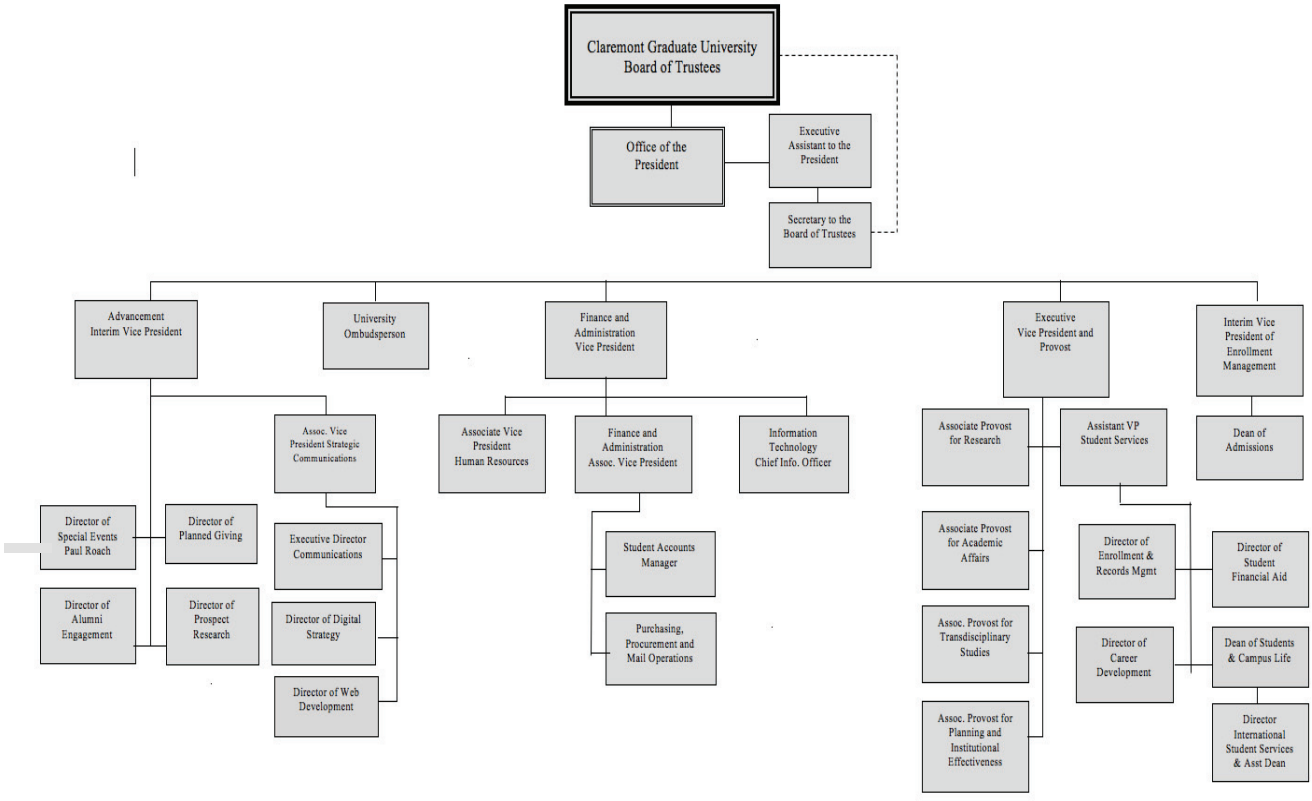


Figure 4.3 Administrative risk owners

www.manaraa.com

The second step was to assign suggested risk owners and responsible departments to every risk. The researcher met with CGU's Vice President and Executive Vice President of Finance and Administration, and the Board of Trustees Chair to suggest and refine the risk owner's list. The new owners included high-level employees among the different departments. Figure 4.2 and 4.3 demonstrate the hierarchy of the chosen risk owners.

Finally, the researcher contacted the identified parties to conduct a comprehensive risk assessment round that covered the whole university. The assessment round lasted for two months. The researcher conducted a one hour meeting with every identified risk owner. The goals of the interviews were:

1. Review, confirm and discuss the risks within the proposed risk register.
2. Confirm and discuss the ownership of every risk.
3. Identify new risk owners.
4. Identify and discuss new risks related to the interviewee's area.

The interviews were also used to evaluate and understand the university's readiness for the information technology phase of the ERM process. The researcher conducted a focus group meeting with CGU's deans collaboratively with the Vice President of Finance and Administration. The focus group was used to evaluate the common issues and risks among CGU's different schools as part of the risk assessment. The meeting was followed by individual interviews with every school dean.

4.1.4. Evaluation and Reflection

The outcomes of the new ERM plan and risk assessments were evaluated and approved by CGU's leadership. The new risk register and a report describing the proposed

المنارة للاستشارات
www.manaraa.com

changes were also presented to CGU's president and vice presidents during a Board of Trustees meeting. The researcher received feedback and the approval of the new ERM process structures and outcomes and, once obtained, CGU's ERM process was ready for a KM intervention. This marked the end of the first AR cycle at CGU and a decision was made to move to the second cycle.

4.2. The Knowledge management intervention

This section provides a detailed description of the action research that involves the KM intervention. The section is divided into five sub-sections. Every sub-section represents one of the five phases of CAR at both CGU and TCCS.

4.2.1. Diagnosis Phase

The main source of information throughout the diagnosis phase was semi-structured interviews with all individuals in relation to the ERM process. The design process of the interview guide is covered in Chapter Three. The interview guide focused on:

1. Exploring the level of understanding and experience with ERM
2. The local problems and concerns with regard to the ERM process
3. The potential solutions from their perspective
4. Investigating the relationship between the information technology/KM activities and concepts
5. The three main elements of the ERM process identified in the research framework.

The interviews were used to examine the nature of the relationship between ERM and KM practices from their perspective. The information gained from the qualitative investigation helped the researcher understand the nature of the relationship between KM and ERM, and plan for the action phase. The instrument used in this phase was designed

www.manaraa.com

based on three main elements of the ISO 31000: risk assessment, risk monitoring, and risk communication and consultation. The research participants were asked the following open-ended questions presented in Appendix 1.

4.2.1.1. The diagnosis phase at CGU

After the first evaluation phase, the researcher, collaboratively with the research clients, decided to move to the second research cycle. They agreed on the research work hypothesis that the ERM process needs a web-based KM system to overcome the challenges and problems with the process. However, the researcher conducted 15 to 30 minutes interviews with all of CGU's risk owners as part of the problem diagnosis phase with an open mind to other practices and solutions. The list of interviewees included CGU's top management, board members, directors and managers of different administrative departments, provosts, deans and directors of different academic units, etc. These individuals were selected based on the list of risk owners identified in the first research cycle at CGU. The interviewing process continued for a month and a half.

The initial finding:

The researcher transcribed the interviews and the scripts were coded and analyzed. The information gained from each participant was interpreted from the perspective of how KM appeared to be affecting ERM practices.

Part one:

Exploring the general understanding and experience with the ERM process among all risks owners.

The results of the interviews in this part helped the researcher to understand the deep layers of ERM practices and the level of experience with ERM. The results, in general, divided the participants into a medium level of experience and high level of experience.

www.manaraa.com

The analysis showed that the risk owners who were involved in the ERM process at CGU from the start or in RM activities previously have more understanding of ERM activities. However, analysis of interviews showed that the majority of the participants have a weak understanding of the purpose of ERM activities due to the isolated and confidential approach to ERM activates. The main frustration among the majority of the risk owners is with the lack of involvement and access to the ERM process. Among several statements about this issue are the following:

> *I was part of the interviews that were conducted with RM team, but I am not involved in any part of access to anything within this process. And I don't know anything about the type of data that came out of that process.*

> *In my roles, I will report to the provost or the deans if there are any risks I feel I need to report. But there are no systematic approaches or structure to follow in term of reporting risks or risk changes*

The respondents mentioned a number of the issues that resulted from the lack of involvement and access to the ERM process like the poor risk management culture, the low trust of the process and misunderstanding the goals of ERM. A key staff member mentioned the following:

> *What was conducted before, in most cases, it was found intimidating and I felt like the ERM process is about finding something wrong with my work. The way that process was done was lacking the RM culture and the educational part of why we need RM. We need to have the understanding of the meaning of RM, which is how to make CGU better and deal with risks better.*

Another primary participant employee indicated the following:

> *However, the experiences that I got made me think that RM is about physical risks. My understanding was that it is related to how things are successful in your office. What is the security level of things? I think if the ERM team gave me access to the type of risks that they are looking for, I would have a better understanding of my role in the process and the areas I need to consider in terms of thinking about risks.*

www.manaraa.com

A faculty participant discussed how the involvement in the process will increase the sense of urgency and ownership over the risks, which is a critical factor that supports the success of the ERM process:

> *As faculty, I know that there are some actions that been done, but I didn't interact with any activities. We felt like we need to collect information about the risks associated with our works, but there was no formal action about it or communication. The process is still largely done by others and there is a missing sense of urgency about the RM process. We felt that identifying, monitoring and dealing with risks are not part of what we are required to do.*

Another participant commented on how the access to the organizational risks is needed for the regular operations of their department. When asked about how they deal with this need to access risk information, the following response was received:

> *We have some list of risks that we deal with internally but not on an enterprise level. We have some regular reports that we run, and we try to do benchmarking so we compare ourselves to others so we could see if we are doing the right things. However, we have no idea what other people with similar issues are doing and we participate in many committees around the campus to become a lens to evaluate the different issues and problems that the university has. However, all of these efforts are done by our department and not provided through the ERM process.*

Because of the lack of involvement and access to the organizational risks, many of the risk owners couldnot recognize the difference between looking at risks from a local view and from an enterprise view. This increased the misunderstanding of the purpose of ERM and the lack of trust in the process. One of the participants mentioned the following:

> *In the past, I did this type of risk assessment where an interview was conducted with me, and after I insisted to know what happened to my inputs the RM team told me after that all of the things that I came up with were re-evaluated and determined to be at a lower evaluation than what we reported. That made me thinks that my participation in the process wasn't needed because our office was seen as not the essential source of information about risks. I really think that there is no point in participating in the RM process with the confidential and isolated approach.*

www.manaraa.com

One of the individuals from CGU's top management discussed how empowering the RM culture is one of the main challenges that CGU is facing in terms of achieving a successful ERM process:

> *There are a few challenges, but the most important one is that ERM is a new area for CGU. Evaluating risks takes time as it conducted in the face-to-face status. We have to cover many areas before we reach one that has an issue or risk with the need to take action. We don't have a culture of risk management. We have to start building the culture and empowering it and creating a trust of ERM process then we need to find a mechanism to identify, address and continue to make progress in the area of Risk Management. The ERM process needs to be communicated clearly with the top management and the different departments. Until RM culture makes progress with the executive team and the top management, the ERM program will still face issues and struggles.*

The majority of the employees participating in the process do not understand what the role of ERM in their job activities and how the process is an important part of their outcomes.

Part Two:

This part describes the main practices and challenges of the risk assessment process at CGU. The discussion extends to explore what types of practices are needed to support risk assessment activities.

Many interviewees indicated that the risk sharing and KM practices were associated with enhancing collaborative risk assessment and risk-mitigating. The following are examples of these statements:

> I *think we need some sort of feedback about the information identified and need to have the ability to access the information we identified and other people with relation to our work identified.*
>
> *I don't know to which level this information about risks will be shared, but I do believe that the ERM process and the information identified and analyzed need to be shared to a certain level to allow us to evaluate and mitigate the risks collectively. And will help us to increase and enhance the risk culture and sharing culture. The past feeling about KM process was that a KM person is responsible about fixing everything. We need to have a committee in every department to evaluate risks and identifies the risks and then*

www.manaraa.com

communicate them with the top management, either actual or virtual committee through technological means.

Another participant extended the discussion about the issues caused by the lack of involvement and considered automating part of the process and allowing access to the risk information is the path to solving these issues. What follows is part of his response:

My problem with the current process is that I don't remember seeing results or any quantifying or qualifying information about what we did or identified. There was no communication or involvement regarding the data, we identified or any other data. The process was just pure data collection without any other actions. I think that automating some of this process will be useful and allowing me as risk owner to go and update or identify the risk associated with my area is very ideal and needed through a system. This will allow time for me to think and edit and make sure that I reflect on what I need to identify and formulate the ideas. I think they need to give the people involved better education about it and improve the culture and the understanding of the process and engage the involvement of everyone in the process.

RM culture was mentioned throughout the interviews as one of the main challenges that are facing CGU's ERM. The risk knowledge sharing was seen as an important factor in achieving better RM culture that will help the organization to strengthen the risk assessment activities. The following statement explains one of these views:

Even knowing about other issues around me will help me to understand why my issues are less important at the enterprise level compared to how important it is in my department level. The satisfaction and the belief in the process will increase if the organization has some sort of risk knowledge sharing activities. Also when I am aware of the most significant risks here in the organization, I think that I will put more effort into the parts of my job that will affect these substantial risks and help to improve them.

Another participant expanded to explain how sharing risk knowledge would help the risk owner make better identification and evaluation of the risks from the enterprise perspective instead of the local perspective:

The limited view of the organization is making some of the people misunderstand the goal and the purpose of the risk assessment and identify things that are away from the big goals of the ERM process. I think the more people gain access to other risk areas in the

www.manaraa.com

university the more we will reach a common understanding of the risk management process and the big goals of the university. They need this access as they look at risks from the self-interested point of view to a view that includes the university as a whole.

One of the participants talked about the problems with the interview-based risk assessments at CGU like the lack of focus and the weak understanding of the expectation out of the process. Specifically, he mentioned that:

I think the majority of people interviewed have no idea what is a risk assessment. People went to all different directions and all kinds of things that were involved in the exercise. The scope of the assessment was too vague and sometimes wrong. We need to emphasize the RAs or find a way that gives us an idea of what the ideal outcomes and expected typical risks that a graduate institution would face or the organization care about. Our problem is with our ambiguous role in the RA process.

Another participant indicated that there is a need for better understanding of the process. She talked about how a hybrid approach to risks assessment, which includes face-to-face and automated system, is what is ideal for RA at CGU:

We started with a written strategy, and that was confusing and unclear about what are the risks. The majority of individuals could not identify risks as there were no database or some kind of organizational memory associated with my role. There is a need for explanation to cover the meaning of the risks and the process at first to make much sense of the risks assessments. The face-to-face communication is essential at the early stages of the process to start the RM educational process. However, technology and sharing systems are facilitating the efforts to look at the risks from a different point of view and to have ownership over the risks that are associated with our work.

Many participants supported this opinion. However, they discussed practices like risk-sharing activities, documentation, risk knowledge tracking and access to risk information as important to accompany face-to-face risk assessments. They stressed the significance of using the human risk assessments as the initial means of collecting risk information. An example of a typical response is:

I think that the face-to-face interaction is very helpful especially for me to get an idea about what we are doing and make me feel much more secure and confident that someone is systematically thinking about where our formability is. Trying to assess them

www.manaraa.com

and evaluate them. The face-to-face component is really important because as you can see, there are so many contexts within every risk that to probably identify them we need open discussion. If there is anything to add is to help me structure the type of risks so I have a guideline that will help me brainstorm and think about things. To prevent me from being overwhelmed and helping me get some structure. I will apprise if there is documentation process that will help us be aware of the risks and to track the risks probably.

Another participant expands on explaining why a dual approach is needed and how technology knowledge sharing is ideal to help the process in the long run:

Because the people are having problems with understanding the main goal out of this process, a hybrid approach to the risk assessment is the ideal way of conducting this type of risk assessment. As a first timer or a person who still doesn't fully understand the process, the face-to-face interview is essential and needed. However, in the long run, the technology can play a bigger role in that process. I think that the face-to-face interview is essential when it comes to identifying new or small issues or starting to make people involved in the process and to understand the purpose and the main goals behind the process. This would be more difficult if we did it through an online process like email or online survey. My only suggestion would be maybe explaining the process better before starting to do the interview. There is a need to communicate and consult over the identified risks. Face-to-face interviews are effective to a certain level. Since you are relying on individual opinion to think from a high level, there might be some things that are missing. The office of risk management needs to participate in events to create some base of best practices. We need to incorporate the efforts of every individual and external expert who can help the process and correct what is wrong.

Another participant in a department leader position called for enhanced risk-sharing activities and greater access to risks information to coalesce the risk assessment outcomes. She stated:

I think the face-to-face interaction achieved a lot of benefits to help understand the RA process and to help the individuals to understated the purpose of the process and to brainstorm and analyze the risks. However, I would be interested to hear about other things that people identified and I forgot about. Seeing other people's opinions and interpretations of the same situations are needed. As there is a number of things that I didn't think about, a colleague might be thinking about. Also, this will help us to know where our colleague's strength is to use them and what their weakness are to help if we can.

www.manaraa.com

People need to open themselves up and forget about the fear of sharing issues and risks with other people and the university in general. The fear of sharing is about people using this information to get you or harm you.

When asked about the idea of allowing the risk owners to routinely identify, analyze and evaluate risks, there was an overall agreement. The participants agreed that this is needed for both follow-up and voluntarily risk assessments. An example of that is the following statement:

There is a number of areas where the routine approach is ideal. However as ERM programs are really small we need to be careful to not overwhelm ourselves with too many re-evaluations that come at the same time. If this is an ongoing process, the risks the owner must keep looking and thinking and evaluating the risks. I think if people were able to see other risks in other departments they will be able to think more about what are the risks that they need to report or identify. So an access to a database full of risks that are relevant is essential to advance this process. The access might make them realize that what they think about in terms of risks is really not raising these to a level that they were thinking about.

Participants talked about how important it is to give the employees some ownership over risks and enable them to choose when to report on new risks. One of the responses includes how this will help in saving time and resources:

I think it's essential to be able to choose to update the risk because I think something has changed and this will give me ownership over the risks and make me more involved in the ERM process and the treatment. Or when the top management wants an update about some of the risks, and this will save my time and ERM time by allowing me to go myself and update the risk and feel that they are aware of the risks I am facing and make me want to make improvements to the top management can see.

Another respondent suggested that allowing people to report risks independently requires fixing the RM culture and educating individuals about the objectives and value behind the process first. She called for more involvement and access to risk knowledge as follows:

To make the people who will report the risk to be comfortable with the concept of reporting, we need to see the value of sharing risks. CGU is missing that right now. We need to change the culture first then after that, we start the reporting process. We need to see how this process is making our department and job become better. We need to see and be involved in the experience of other departments. However, we need to make sure that people are not feeling threatened by reporting things. The need to see it through a

www.manaraa.com

positive lenses is the way to improve situations and to build trust and confidence and helping each other. However, if this is an ongoing process, the risk owner must keep looking, thinking and evaluating the risks. I think if we were able to see other risks in other departments we will be able to think more about what are the risks that we need to report or identify. So an access to a database full of risks that are relevant is essential to advance this process.

Another participant discussed how allowing people to report risks independently are essential to create a sense of urgency and to motivate the departments and employees to contribute more to the process:

Our offices are full of activities that keep changing and we are adding new tasks and activities all the time. It's important to be able to upgrade and downgrade the risks in the way that reflect the current status of CGU. So this option will allow adding and editing as we go. If change and we find a system or a tool that will allow working with our risks in the same format but we can add, edit based on the changes that we are having. This will give us a lot of potentials and make us compete in the ERM process and feel like its part of our responsibility. The most important thing is that to make the process look like it's owned by everyone and it's not some unwanted task that the face-to-face interviews usually are. The technology will help with that by allowing the people to think about risks and edit them as they go.

Similarly, another participant states the following:

I think the process to routinely identify, analyze and evaluate risks must be done on an as-needed basis, which means whenever the values get changed, or the management needs an update. These need to be part of the RM culture and will create a sense of ownership over risks and raise the sense of responsibility to be a factor in changing and reducing them. There is increasing anxiety over sharing risks with others created because of the confidential approach in dealing with risks. The problem with us now that we don't understand the purpose of ERM and seeing our risks in front of us, having the power to edit them will help the worker understand the purpose of RM and increase and build the risk sharing culture. This, as I told you before, will increase the ownership and the responsibility for risks. I think I will feel more comfortable to feel control over the things I already reported. I think it's a good idea and is needed to be done through technology to allow me as risk owner to feel comfortable about my ability to change it if I thought it's in need of a change.

What role can technology play in risk assessment?

The participants talked about how technology can help CGU to move from a static view to the historical tracking of the risks. Among many participants, shared risk knowledge storage,

www.manaraa.com

historical tracking tools, and sharing tools were the most mentioned items. They discussed how these tools are important for CGU's ERM where it can help overcome many of the issues and challenges. They even gave examples of specific functionalities that CGU could use to enhance ERM activities. The following responses offer evidence to these statements:

> *I think technology can perform and help with the majority of the items I mentioned before. Like risk knowledge storage that captures information about risks and we can access it at any time. Or risk-sharing tools where we can go and share risks that are happening in our department. Or tools that allow us to some extent to access other people's risk information and use it to help the other departments to mitigate those risks. I think the technology will facilitate the search features if there is a way to have some sort of annual report to show improvements and depreciations.*

> *Technology can play a huge role as technology will be a strong means to organize and force templates into the process. Technology can easily help the risk owners to track the risks' change over time which can help us think about new things. Sharing tools can lead to more brainstorming and open the chance to new ideas. The simplest thing is to have a routine notification schedule to remind people of the re-evaluation process and reduce the extra overhead that this process will need. The technology will help in reviewing the current status alerting the organization about high-level risks.*

> *Technology can play a significant role in making the ERM process more efficient. By doing things like assigning risk owners to the risks we can send reminders to ask them to participate in the new risk assessment or follow up with some risks or ask them for feedback if there is an automatic way that will help us monitor all the information about risks with multi-level access. It also allows us to maintain our risk records. Where we will be able to know where we have been and what areas are new and what has been changed.*

Another participant argues that a risk sharing system can work as a collaborative enabler:

> *Having the tool will help us check on each other and other related departments to give us a sense of what I can help with or motivate us to be more involved in the risk management process and seeing other people's risk information will help us see other parts of our work that we didn't pay attention to in the past. I think also looking at other people's identified risks would help me think about areas I didn't think about in the past. And seeing the problems associated with students or the university in other areas and departments will help us to expand the type of activities that we are doing and introduce new things to solve the problems associated with other departments that we can solve. Technology can help us share the information about risks more clearly and more importantly and can help us plan for the mitigation process and track our achievements and progress.*

www.manaraa.com

Another mentioned risk collecting tools as a way to help CGU save the time and resources invested in the ERM process and produce more efficient results:

> *I think technology will take a lot of burden from the ERM team while collecting information about risks on an enterprise level. I think technology will allow you to get more accurate information than the one you might collect personally as it will take away some of the human mistakes. Especially with the ranking process, the software is ideal and easier to use for many people sharing their input at the same time."*

Part three:

In this section, the participants discussed the practices and problems with the risks monitoring activities at CGU and the essentials actions to improve the monitoring process.

The VP of finance commented on the risk-monitoring situation at CGU by saying:

> *ERM is not a one-time exercise. I think there is no point out of doing RA in the first place if there is no intention to revisit these risks. I think having a consistent list of the most likely and the most highly rated risks that you ask about every year or half year or less. Different risks need the different frequency of revisiting these risks. This will help us as risk owners to be accountable for addressing the risks and dealing with them. That makes perfect sense. They may change so you may have to add more items as you go. Continuous monitoring of the risks is what is missing in the current process at CGU. I think that will keep everyone in CGU accountable and sustains our growth. The presence of the reassessment activities will help us to change the problems and the issues associated with our work here. No one wants anyone to find that two years passed, for example, and they didn't change anything about the issues we already identified. Clearly, going back and reviewing risks is a significant issue that needs an immediate fix.*

One of the participants discussed the stakes and the issues with risk monitoring at CGU. He believes that centralization and the lack of collaborative contributions throughout the university are the main cause of these problems. A summary of his statements is as follows:

> *"There is no formal risk monitoring activity as far as I know, especially in relation to the ERM process. Monitoring is essential; however, I do understand that this costs a lot in terms of resources and time. The ERM is performing the process completely human-based through interviews and observations and the process itself is very centralized where the team performs all activities. This places a lot of overhead and delay on the process and the team. I believe that's why the risk monitoring is not as effective as it should be. I think that dividing the work and allowing some decentralization is fundamental to take the ERM process to the next level."*

www.manaraa.com

The lack of top management involvement in the process and access to risk information were seen as part of the solution by another participant:

> *I think that the top management needs to be involved more in the ERM process and the monitoring process of risks. These need to have access as they go over all the risks in the organization and especially the risks connected to their areas of management. The idea of having some shared database where an employee can explore and understand the current situation in their area in terms of risks is another needed feature. I think that tools that manage risk knowledge will be the first step to maintain the observing activities and we can follow that with meetings and review seasons. Having access to the updated data and being able to discuss change on regular basis is very important. Because monitoring without active efforts to change the process is meaningless. Communicating tools is the key because the top management will be the key players in moving towards the risk treatments.*

Many participants agreed that automated risk monitoring activities are what CGU needs to overcome the challenges surrounding the RM activities. An example of a response regarding this idea follows:

> *I think technology can take over on this part as I already edified and discussed the risks, and you have a good understanding of the explanation of the risks and the current status. So the revisiting can be majorly done electronically by allowing me and others to share the risks update and to have access to the previously identified risks. I think once the people were aware of how the risk of the technology can play a major role in this process, the technology is in need of the competition with the human interaction and with the risks in the identification stage. However, when we come to the monitoring stage, technology can play a major part and should be able to take the place of everything else. The face-to-face interaction can serve as a supplementary activity or onanad-ad-hoc basis.*

Ease of use, reduced process overheads and time-saving were among many reasons that make the use of technology, which enables collaboration and information sharing and storing, ideal for the risk monitoring activities. The following statements are examples of that:

> *The reevaluation is well needed and essential. We need to set regular times to check on these items. Technology can keep track of the tasks related to RM, give an idea of what is expected to be done and help reduce the pressure on the RM team. I think the reviewing process will be easier both ways for us as individuals and for the RM team when the risk*

www.manaraa.com

management activities are divided and collaborative among them. I think technology can make things more organized and allow the knowledge of risk to be stored with the historical changes that every risk has gone through it.

We need the technology to help us maintain and ease this process. I think that at this stage we can rely more on technology and automatic assessment. There are many forms where technology can help in the monitoring process like providing a notification system to remind people to reevaluate risks, an information sharing tools shared database where people are continuously aware of their risks and the risks associated with their environments.

Re-assessment and monitoring can be easily done with the use of information technology in almost all cases because it's more efficient and time-saving. I think people can do it whenever that is a convenience to them. Technology needs to be employed in the process to enhance collaboration and communication. Also, I think technology needs to be used to share and be involved in the best practices that other people did to mitigate risks. I would like to know what other schools did to mitigate the risks that my college is facing. We need to be a learning organization in terms of risk managing and monitoring. Risk information sharing and communicating will guide the monitoring process and make us more aware of the monitoring needs.

Part four:

This part evaluates the lines of communication in relation to risks and how CGU is employing the available resources to review and mitigate risks. The results showed disapproval of the current communication in relation to risk. There is general agreement that the ERM process is too isolated and lacking both bottom-up and top-down communication. Examples of the statements are the following:

There is no system or process that I know of that allows us to have some sort of communication about risks. I think we are running in silos where everyone maintains their problems. We identify and resolve risks all the time internally and we communicate them verbally or through a meeting whenever there are big things with the department that are in direct relation to the risk. However, it's never done through the formal ERM process.

The communication here is done personally through the lines of command. We have weekly one-on-one meetings to check on the things that we need to change or take care of to avoid things accumulating. I think we need some sort of standardization and historical tracking of risks communication. We need to have some sort of regular reporting on

www.manaraa.com

issues and have faculty training and development around their roles on a regular basis to help address the problems with communicating.

I think that the line of communication needs to be empowered at both levels, top, and bottom. Both levels need to be aware and informed about the risks and updates regarding emerging risks in one area, the risk treatments in place and the changes in risk levels. There are certain risks that are seen at the top levels that the bottom level needs to be aware of, so having a mechanism where that type of information flowing all the time between all levels with some exception is ideal for ERM.

Technology-based communication tools are seen as an enabler that helps the organization use its own resources for consultation and collaboration. One participant stated the following:

The right communication tools can play a major role in introducing a more efficient line of communication. The risks report will be there, and the people will be notified about changes and they can come back to integrate with this risk is always an option. The top management or another involved employee can integrate with the risk from a risk treatment standpoint. They can provide a consultation suggestion about how to mitigate the risks and fix it. And that is the beauty of the KM systems because it's a great way to integrate the whole organization into the solution and the progress.

Similarly, another participant discussed how these types of tools are important and enable collaboration across the university:

I think it's essential to improve the line of communication across the university through the use of communication and risk sharing tools. As I want to make sure when I report about something related to risks in my organization, that someone is looking at it and it's there historically stored, and we can return to it whenever we need. As I said I think it makes it easier to access information and make sure that someone is aware of your reporting. It will help me to understand that other people are having similar issues and we can work to fix them or to make the top management more aware of them.

The majority of the participants revealed the role of technology and agreed that risk sharing and communicating tools would contribute to fixing the issues that ERM is facing and allowing CGU to be a learning organization. Examples of these statements are the following:

The ERM process here at CGU needs tools that provide real-time updates about risks and keep track of risks over time. So if there is a risk that exists in a way that concerns us we can follow up with it. In addition, I think sharing risks knowledge creates more awareness and sense of community at CGU. I think sharing risk knowledge will help motivate people to be part of the solution. I think technology can help to clear the line of

www.manaraa.com

communication sharing best practices among other departments so the organizations can benefit from each other.

Clearly there is a way to electronically upload the risk related information and knowing that someone will look at it and it's there stored for any historical references. I think this will be a great step and knowing that you will be able to share the risks whenever you have the option and communicate about the risks and be involved in the other risks related to your work that has been shared with other people.

Part five:

This part gives an overview of the transparency issues, values, and needs at CGU. The ERM process was completely confidential at the time the researcher conducted these interviews, which led to many disagreements that were discussed throughout the four previous parts. The participants here were questioned about the type of transparency that they think ideal for ERM at CGU and how they think transparency could play role in advance the ERM.

Some participants called for total transparency for the risk management at CGU:

Full transparency means a better use of CGU's resources. I think people are afraid of transparency because they are afraid of getting punished or they will be pointed out about things they might identify. The resistance to be exposed is human nature. I think transparency is the major way of allowing the organization to use all the possible resources to fix itself and overcome problems with the minimum effort possible. When the people within other departments see all the risks associated with the organization like in a KM system, the CGU staff can volunteer or provide insight and help to come from their area of expertise to fix the problems that the organization has or at least guide the solutions. Also documenting how the organization overcomes problems and allowing the people to see that this will give feedback to other departments about possible ways of fixing their problems.

At a macro level, I think being fully transparent is the way to go and can help to make CGU work as one entity. The risks need to be communicated to the board and any person involved in the processes unless if the information is sensitive. I think sharing the summary and giving people access to the general status of the risks outside their area is a good idea. The accessibility to this information will help enhance the sharing culture and the resistance to participate in the process. I think being fully transparent is the ideal way of doing it as it can help to make the organization work as one entity. The risks need to be communicated to the board and any person involved in the processes.

www.manaraa.com

Meantime, the majority of participants at CGU hesitated to approve full transparency, though they totally disprove of the old confidential approach. They were very supportive of a semi-transparent approach where risks are shared among departments and areas. Examples of the received responses are the following:

> *Away from the legal aspect, transparency should be on the basis of who should know what. The transparency within the department is the ideal way. You don't want everybody on campus freaking out about risks that do nothing to them. I expect this thing myself when I was involved in risk discussion that goes beyond what I am experiencing. It's important to understand what other people are facing, especially in connection to my department, and it will help us as a department to explore more risks and opportunities and as an enterprise, as we might be able to help and be a factor in mitigating some of the risks.*

> *Transparency with some controls is the ideal way to do ERM. Risk knowledge sharing flow of information and information access at multiple levels are practices that the organization does need. That will help us expand and empower the risk knowledge sharing culture throughout the organization and will empower the organization ERM efforts. People will recognize that similar issues are being addressed in different departments. These will help the individual to understand that we are all working toward the same goals and we are all doing this. That will strengthen ERM and facilitate the organization progress without the dependency on one person or another.*

> *You don't want everybody on campus freaking out about risks that do nothing to them. I expect this thing myself when I was involved in risk discussion that goes beyond what I am experiencing. Sharing risks that people can have some agency over them is important, but anything more than that might lead to unwanted results.*

> *I think semi-transparency is ideal as what is the point of sharing everything among everyone and the people will feel comfortable to participate in the process when the number of people involved is smaller and within their area of concerns. I don't know if making everything fully transparent is efficient, however, I definitely believe sharing risk information within each group with the same areas of interests is ideal. Fully transparent is a bit confusing and unnecessary.*

4.2.1.2. The diagnosis phase at TCCS:

As discussed in Chapter Three, TCCS formed a committee that represents the majority of the areas in TCCS's risk register, which is capturing the key departments in TCCS. Every person collaborates with co-workers inside the committee or outside the company looking to

www.manaraa.com

provide inputs to the process. One person was responsible to make sure that all the data discussed in the meeting are entered into that risk register. The researcher participated and observed ERM activities at TCCS. The initial evaluation of TCCS showed that the organization is developed enough and ready for KM intervention. The Vice President of Finance and Administration and the Risk Manager both agreed on the research working hypothesis that the ERM process needs a web-based KM system to overcome the challenges and problems TCCS is facing. However, the researcher conducted 15- to 30-minute interviews with all of CGU's risk owners as part of the problem diagnosis stage to deeply understand the problems and systems requirements with an open mind to other practices and solutions.

The initial finding:

The interviewer has transcribed the interviews and the scripts have been coded and analyzed. The information gained from each participant was interpreted from the perspective of how KM appeared to be affecting ERM practices.

Part one:

This part explores the general understanding and experience with the ERM process among all the risk owners. The ERM committee members who have been involved for a longer time with the ERM process appear to have a better understanding of the process and challenges that they need to overcome. The results showed that the more involvement and access to the process, the better understanding of the process and the higher the RM culture.

One of the primary participants at TCCS discussed the current process and challenges at TCCS as the follows:

> *The primary assessment responsibility is for someone on the risk assessment team. However, that individual can issue the risks to other people to evaluate the overall*

www.manaraa.com

perspective of the risks. The meetings were a collaborative kind of setting. We have a matrix of concentrated areas. Every meeting we come in and focus on one specific department. The biggest problem with TCCS ERM is organizing and tracking all the risks knowledge coming out of the committee meetings and audit meetings and maintain a consistent process. If you are not organized you can fall into the trap of having data integrity issues. Problems like what version we are on in that matrix and who said what this time. We are thinking of automating the systems then send specific tasks to other individuals to work on the evaluation of these functions and taking some of the load off of the top employees here in TCCS.

Another participant expanded on the same view and discussed more challenges and issues with the current ERM activities, mainly with the level of communication and lack of tracking risk information beyond the meetings:

Risk register *I like the human interaction within the committee meeting. That helped to identify the issues from different perspectives. The human interaction helps us with the evaluation part. And to evaluate how likely that thing might happen. However, I think we need to give the people involved better education about ERM, improved the culture and the understanding of the process and engaged the involvement of everyone in the process. The administration of the process as it is now is complex and doesn't allow the committee to extend the process to include the mitigating plan. Also, there is a gap of communication within our committee and between us and other committees in TCCS. We don't hear or discuss risks beyond the monthly meetings. The meeting is designed to use the knowledge from all the participating departments, but however, we need to use tools or strategies to help us track and stay informed of the changes."*

Another participant argued that the risk assessments and monitoring are taking longer than they should take. She thinks that if TCCS gave access to the risk register and asked everyone to do the risk assessments before the meetings, then the committee can use the meeting time for more important subjects and the risk assessments will take a shorter time. Part of her response is the following:

We will go every month through the assessment line by line and take a look at how the individual who was assigned to the assessment evaluated the likelihood and impact and used some recommendation from other areas to change the evaluation of the risks. We use the meetings to compare the assessment to the overall objective of the organization to determine if it's too high or too low. The challenge here is to keep track of all the inputs and mixed discussion during the meetings and to make sure that all the members are aware of the documentation after the meetings.

www.manaraa.com

I think what if we could give the members access to the risk information so they could review them and come to the meeting with more constructive inputs and suggestions. This will save us a lot of time, as the assessments and review cost us more time and resources then what it should be. We can use the meeting time to agree on the items that we disagree on, come up with mitigating plans and prioritize the risks.

Part two:

This part describes the main challenges, issues, and progress points with the risk assessment process at TCCS. The discussion includes the participants' suggestions on supporting the development of the risk assessment activities. The participants from TCCS agreed with the participants at CGU on the importance of using a hybrid approach to deal with risk assessments. They argued that the human interaction is needed as educational tool and way to help ERM understated the process expectation. A couple of examples of this opinion is the following:

The meeting or the human interaction is needed to help different members understand the ideas and the different risks and work as an educational tool so they can give a realistic evaluation. The meeting is a very effective approach, but combining that with technology will help the people brainstorm and report things before, so the meeting becomes a more effective and organized meeting that takes less time. The technology can reduce the time needed to get this done dramatically. We need a database that systemically contains all types of risk information instead of trying to formalize and share them yourself and track the changes manually.

Another participant stated:

I think the face-to-face interaction is the ideal way to conduct a first risk identification round. Or at least to identify the risks associated with the work. I think the human interaction gives us a chance to reflect on the things that we need to consider and often forget about. I think accompanying this some online standardized tool would help with the follow-up process to identify more risks in the long run.

Assigning risk owners to every risk was raised as an essential factor to empower the RAs and create a sense of agency among the committee members. A primary member of the ERM committee discussed this issue:

www.manaraa.com

At some point, we need to assign risks to risk owners and authorize them to perform the risk assessments and identify new risks independently from the meetings. I think that if we could find a systematic tool where we can identify and evaluate risks outside the meeting then discuss them shortly within the meetings, we would achieve much more effective risk assessments. However, this type of authorization to edit risks outcomes and make decisions needs to stay with the committee members. As some of the small employees might have a small risk and they might feel that this risk is 5 in likelihood and impact but after comparing it to the other risk it will be way less. As the people tend to put themselves as more important than anything else, a big part of the final discussion needs to stay within the spectrum of the committee members, at both levels virtually and physically.

There is a number of technical challenges that deter the organization's recourses. The following responses highlight some of these issues:

Keeping track of the spreadsheet, what is the most updated one is one of the main technical difficulties with our process. We solved that by having one person who checks in the documents and updates them to make sure that we have consistent updates. However, the spreadsheets and historical data are hard to track and cost a lot of time and resources.

We have risks that are redundant and cross multiple departments. Using software and database with a system that can cross-reference risks can minimize the inconsistency of the definition of one risk. Technology can help the committee member visualize and realize the current risks and move toward identifying what is missing and collaboratively control them beyond the meeting. We need Information sharing to enable the collective RAs. The technology will help in reviewing the current statuses, alerting the organization about high-level risks, saving the historical information about risks and reminding people of the needed action in real time.

Routine risk assessments are essential components and happen to be missing from the current ERM at TCCS. Information and communication management can further enable and support this type of activity. This is supported as below:

If this is an ongoing process, the risks owner must keep looking and thinking and evaluating the risks even outside the meetings. If something new comes up, I should be able to report or identify that in my own base vs. waiting for the committee meeting to report that. This is important as with giving control to the person over the risks related to his or her work, the person will contribute to the process more and will work harder to mitigate the risks and make sure that the organization is aware of them and the need to fix them. The feeling that I can change them or add to them will give me as a risk owner agency over risks. Immediate and real-time reporting of risks that are shared on the

www.manaraa.com

enterprise level is precisely where technology can help. I would love to see the information flow from the individual involved in the process voluntarily more than depending on the meetings only.

There was a general agreement on the critical role of technology in fixing the current issues with the process and produce more efficient RAs. The following responses offer evidence to the previous statements:

We need a system that allows organizations to integrate and update the risk-related information. Give some kind of profile to each risk and allow the people involved to access these risks at any time and maybe adding to them and editing them. This would be reported to the people with concerns and sent to the administration of that organization to alert them about the updates and the important progress. Technology can facilitate the presentation and the access to the historical data about risks and manage the data about the risks. The right technology will provide a risk register that is easy to access and a place where people can be notified about changes.

Our RA practices are very isolated within the meetings and having access to a database that includes the risks will help us identify more risks and revisiting and rethinking about what is missing and how we can improve. I believe that in the long run KM technologies can take the place of human interaction as it becomes clearer what is expected.

I think a project management software or KM tool will help us overcome many of these problems. We need some systems that could help us maintain the historical data. Having the information on this website will help us know what is up-to-date as long as the history of that risk. As of now, we have to move from the spreadsheet to another to identify this information. We need a tool that helps us to follow up with risk-related information. Another good help out of it is that it could help us by reporting out information and update them regularly. Inputs from different departments we can use technology to have these inputs in real-time communication, and use it to better the risks information tracking.

Part three:

This section covers what the members discussed concerning the current state of the risk-monitoring activities. Also, this included the areas desiring improvements. Most respondents agreed that there are significant issues with the current monitoring process that is conducted through the committee meetings. In addition, the majority felt that the use of information and communication systems is necessary at the risk monitoring level. This opinion is comparable to

www.manaraa.com

the outcomes from CGU's interviews, where there is a general agreement on the value of information and communication systems when it comes to monitoring risks. Some of the responses captured as pertains to this matter are as follow:

> *The revisiting is slowly happening here in the organization. I think this is a very essential and important part of the process. We need the technology to help us maintain and ease this process. As we are as a committee, we don't have time to go and review all of these risks. The committee time must go toward more important tasks like correcting the errors, discussing the unclear items, planning for actions.*
>
> *I think this part is where technology plays a huge part especially before the meetings to evaluate things as the majority of the members are not interested in discussing other subjects.*
>
> *"I think monitoring is a very essential and important part of the process as there is no point in identifying a risk if we are not planning to go back and revisit it continuously. However, risk monitoring is where we fail to perform as effectively as we should. I think the use of technology must become in parallel to the committee meeting. The monitoring process could happen before the meeting and we use the meetings to confirm and review." Technology can help communication about risks, involving more people in reviewing the mitigating plans and getting support from management and other departments in relation.*

Part four:

The participants were asked to evaluate lines of communication in relation to risks at TCCS. The results showed that there is a clear gap in terms of communication. Equally, there was a general agreement that the members are not aware of any line of communication that negatively affects the efficiency of the process and the RM culture. One of the participants said;

> *"I do not know what the current line of communications is, and I think, we as a committee are not aware of how our efforts and inputs are communicated to both the bottom and top levels. These missing elements discourage us from participating effectively in the process and making us question the value of what we are doing. The weak line of communicating affects the RM culture here in TCCS. The ability to see things and change things while knowing that involved people are aware of the information that I am providing would empower our sense of agency and contribute to the results and the worth of the process."*

www.manaraa.com

Another respondent indicated the communication problems at TCCS as;

> *"Even when we enforce communication, the documentation of communication is not there. Not all the people in relationships will be aware at all times of the risks or the change in the treatment plan and the risk level. I would love to see a tool or process that helps us, at the enterprise level, to have a clearer understanding of how we need to do or did whenever we have an issue."*

Throughout the interviews, communication systems and KM tools were seen as the key when fixing the line of communication issues. Examples of such statements include:

> *Technology can help us keep track of the problems that we are reviewing and make sure that there is a visible record of the issues that can be accessed by everyone. Technology can provide us with the missing transparency and enable collaborative risk assessment and mitigate. There are communicating issues with the current RM process and I think the right technology strategy might contribute to fixing them or at least minimize them.*

> *Technology might help in presenting the finding and empowering the top and the bottom line of communication. And to bring awareness to the organization about the risks and to create a risk culture that motivates everyone to be part of this*."

Part five: Transparency approach to ERM.

The section evaluates whether a transparency approach to ERM is more ideal than the confidential one. TCCS is more about sharing the risks, information and enabling transparency than the case at CGU. One of the primary members of the committee commented on the transparency approach at TCCS as follows:

> *"We recognize the importance of transparency. The ERM process started with a very non-transparent approach. I think that is what slowed us down and did not allow us to progress as fast as we should. However, now we have started to share information on risks across colleges and within TCCS. It is still a hard discussion but we are moving to more transparency."*

Generally, the participants agreed on the value of transparency in enabling and empowering the ERM process. Examples of participant responses are as follows:

www.manaraa.com

"I think transparency is the ideal for TCCS. I think it needed for everyone to be aware of the risks associated with the organization and be able to inform the other departments where we can help or participate."

"We have many risks that need collaboration to be mitigated and the only way to achieve that is to be transparent to allow communication and learning throughout the organization."

However, one participant argues that transparency is acceptable whenever there is a perceived value from the shared information:

"I do not think we need to see irrelevant department risks. Maybe we allow some transparency within the area of interest or maybe transparency within the organization itself. However, it is essential to be involved in the information whether we can help contribute, interact, get the idea from, be aware of, avoid or to hold onto best practices. This will allow us to start conversations and collaborate in terms of fixing issues."

Stage summary:

The stage provided a detailed description of the problems and issues with the ERM process at CGU and TCCS. At this phase, three of the action research principles are represented: The Researcher–Client Agreement, The Cyclical Process Model, and The Principle of Theory. As action research without theory is not research, the ISO 31000 explanation of the ERM process and the Alavi & Leidner (2001) KM Framework guided the development of the instrument in the diagnosis phase. The instrument is divided into five different sections designed to help the researcher explore issues with the ERM process and explore how KM can contribute to addressing these issues.

During the diagnosis phase, the researcher continuously communicated the identified problems and concerns with the research clients. As shown, Table 4.3 provides a summary of the key issues and needs identified at both organizations.

www.manaraa.com

Table 4.2 Summary of Problem Diagnosis

Identified problems and needs	
CGU	**TCCS**
Communication issues: - An isolated and confidential approach to ERM activities. - Lack of communicating about risks and risk-mitigating plans. - Lack of access to in-relation risk information. Collaborative issues: - Lack of collaborative risk assessment. - Lack of collaborative risk-mitigating. - Lack of sense of agency and ownership over the risks. - Lack of risk-sharing culture (increasing anxiety over sharing risks) - Risk knowledge retention. Issues with the ERM process: - The ERM created a burden on the RM team, which consumes the organization's resources. - The ERM activities are time-consuming and slowly progressing. - The absence of formal or risk-monitoring activities. - Disabled voluntarily risk assessments. - Risk owners identify and evaluate the risks from local perspectives instead of an enterprise perspective. - Lack of understanding of the purpose and the value of ERM activities.	Communication issues: - Lack of communication at two levels: - Within the committee. Necessary for the institution to stay informed of the changes and contributions to the process beyond the meetings. - Outside the committee, both at the top and bottom line of communication. - Lack of access to in-relation risk information. Collaborative issues: - Low sense of agency among the committee members, even to the risks that fall under their specific departments. - Lack of involvement of other risks owners outside the committee members. - Lack of collaboration efforts outside the physical committee meeting. Issues with the ERM process: - The absence of risks monitoring activities due to the limited meeting time. - Lack of routine risk assessments activities outside the committee meetings. - Difficulties in organizing and tracking all the risk knowledge coming out of the committee meetings. - Difficulties in maintaining consistent processes. - The administration of the process is complex and time-consuming.

4.2.2. Action planning phase

This section is divided into three sub-sections. The first part presents the detailed thematic analysis of the interviews. The information gained from each participant was interpreted from the perspective of how KM appeared to affect ERM practices. The interviewer transcribed the interviews and the scripts were coded. The analysis examines the dynamics and nature of the relationship between the KM practices and the three chosen components of the ERM process: risk assessments; risk monitoring, and communication and consultation.

www.manaraa.com

The sub-second section discusses the issues identified at the diagnosis stage and provides a detailed description of how the different KM practices and ideas contribute to fixing or minimizing the issues. It further identifies how KM frameworks guided the research intervention. The third part provides the detailed action plan proposed for both CGU and TCCS.

4.2.2.1. Qualitative analysis of the interviews:

The interview guidelines were identified according to the goal of the research, which is to gain insights about the relationship between ERM and KM in practice. During the interviews, participants were questioned about their individual experience and involvement and understanding of the ERM risk management process within their organization. The interview was designed to explore their experience with the ERM process, the positive and negative incidents, and the encountered barriers and missed opportunities for further improvements.

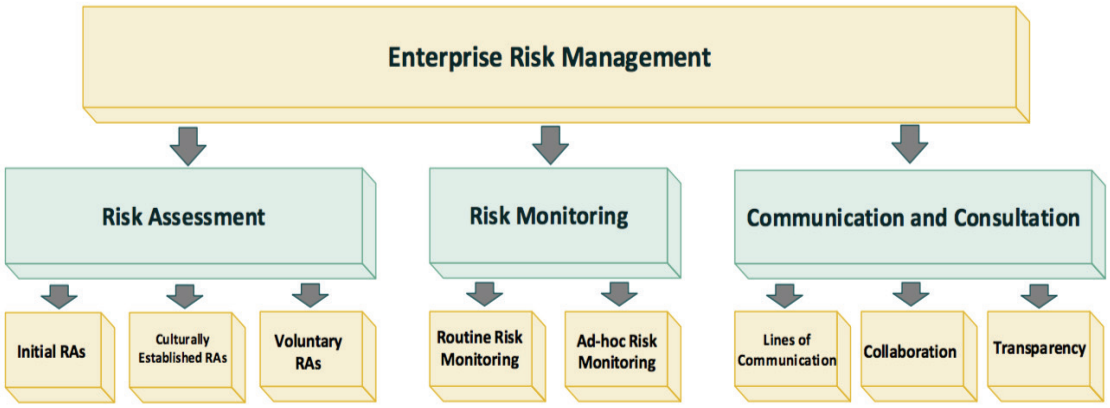


Figure 4.4 Action planning thematic analysis

The researcher summarized all coding results on a large spreadsheet and looked for shared patterns across each of the categories that emerged from the coding (Myers, 1997). The interviews analysis branched every one of the three elements of the ERM process to different

www.manaraa.com

themes. According to the data analysis, every theme represents a different interaction between Risk Assessment and KM practices. Figure 4.4 illustrates the different themes that emerged from the data analysis.

Table 4.3 Summary of the risk assessments analysis

RA theme	RM Practices	KM themes	Other remarks
Initial RAs	• Human-based RAs • RAs mandated by management • Build holistic risk register • Risk owners access the risk register.	Knowledge storing Knowledge transfer Intellectual capital	Human-based RAs is a better approach because of: • Lack of RM understanding • Lack of sense of ownership • Lack of risk sharing culture.
Follow up RAs	• Hybrid approach between human-based RA and KMS-based. • Human interaction is used on an *ad-hoc* basis. • Real-time risk knowledge sharing. • Access to risk historical tracking. • Use persuasion techniques and notification systems.	Knowledge storing Knowledge transfer Knowledge sharing Knowledge utilizing Community of interests Persuasion methods Sharing culture Intellectual capital	KMS based risk assessment used after the organization: • Established shared culture • Trust ERM process • Gain understanding of risk assessment KMS is a better approach because it: • Saves time and resources. • Eases the RA process. • Involves risk owners in the in-relation risks and best practices identified by other individuals. • Creates a sense of ownership over risks.
Voluntary RA	• KM-based risk assessment. • Real-time risk knowledge sharing. • Access to risk historical tracking.	Knowledge storing Knowledge transfer Knowledge sharing Knowledge utilizing Community of interests Intellectual capital Access to best practices Sharing culture	• Ongoing process where the risk owner must keep looking, thinking and evaluating the risks. • IT-based risk sharing. • Information technology is a key to enhancing and supporting routine risk reporting. • RA motived by the awareness of others, including top management, to the problems that they are facing and the solutions they implemented.

I. Risk Assessments

The interview analysis divided the risk assessment process into three different themes: the initial rounds of risk assessments, the rounds after establishing an ERM culture, and the

www.manaraa.com

routine risk assessment conducted voluntarily by individuals within the organization whenever they felt the need to report the new risks. Table 4.3 summarizes the different Risk Assessment themes, practices and patterns that emerged from the interviewee's analysis.

First theme:

The vast majority of the participants from both CGU and TCCS agreed that human interaction, represented by one-on-one interviews, focus groups, and committee meetings are essential in the initial rounds of risk assessment in every department within the organization. The participants from TCCS indicated that the organization needs to gain some understanding of risk assessment practices and trust in the ERM process, which mainly requires human-based data collection, sharing and, transfer. The participants emphasized the significance of the collaborative human-based practices for the evaluation and analysis phases more than with risk identification. Similarly, the participants from CGU felt that the face-to-face interaction as the initial risk assessment would work as an educational tool to help them understand the purpose of the risk assessments and their role in the process. It would serve as the starting point for further assessments.

The participants from CGU discussed the problems and barriers that the confidential approach to risk assessments is creating. Accordingly, the interviewees express the need to gain access to the risks that they, and other individuals in comparable areas, identify, evaluate and analyze. They discussed how they need to feel a sense of ownership over the risks that they are identifying before participating in the process systematically. They further discussed how access to the risk database and risk communication would help enhance the RM culture, and motivate them to participate more in the risk treatments and solutions. Participants from both organizations agreed that access to the risk registries of other individuals at relevant risk areas is

www.manaraa.com

an essential tool in establishing the risk sharing culture, creating communities of interest and giving access to the best practices and information about risk presence, treatment, and plans.

Second theme:

The participants elaborated the same ideas within the second theme identified in this research. The majority of participants agreed that a web-based KM system could be employed to perform risk assessment activities after establishing a shared culture, building trust in the ERM process, and gaining a general understanding of risk management. Without a doubt, they agreed that a hybrid process between human interaction and an IT system is the ideal approach to employ KM management activities within the risk assessment practices. However, the participants at CGU further indicated that human interaction must be used on an *ad-hoc* basis while web-based risk knowledge sharing, transfer, and storage should be the dominant risk assessment practice. Interviewees mentioned that a web-based KM system eases the risk assessment process by saving time and resources, as every individual would be responsible for part of the process compared with the human interaction that is conducted by the ERM team only in the organization.

Participants at both organizations agreed that real-time risk information sharing within departments and areas with similar interests is an essential element for a successful risk assessment process in the long run. Interviewees often mentioned that the implementation of persuasive techniques like a notification system is crucial to the successful employment of a KM system in the risk assessment process. Additionally, the interviewees emphasized the importance of historical tracking of the risk knowledge throughout the organization when performing future risk identification and analysis. KM can help risk owners think about new things as the sharing process of risk knowledge naturally can lead to more brainstorming, thus, opening avenues to

www.manaraa.com

new ideas. The position creates a sense of ownership over risk and elevates the sense of responsibility to be a factor in changing and reducing the risks. Besides, participants at TCCS express how the access to the risk register and the risk sharing tools could help them continuously think about risk and contribute to the process outside the committee meetings.

Third theme:

The third theme identified by the participants in the voluntary risk assessment conducted by individuals within the organization whenever they feel the need to report new risks. Here there is an agreement among the participants to view the risk assessment process as an ongoing process where the risk owner must keep exploring, processing, and evaluating the risks.

At this level, a web-based risk sharing, real-time processing of risk data, and a shared database are what were seen by the participants as vital practices. The majority of the participants recognized the web-based KM system as key to enhancing and supporting routine risk reporting. Further, access to best practices will encourage the involvement of the community in local practices and interests. This involvement is critical to activate and motivate individuals to volunteer and engage in the risk assessment activities. Indeed, the participants indicated that they would be more willing to share risk knowledge in their area when they can expect to receive some form of benefit as an exchange for their sharing. They considered the access to others' risk knowledge as a major form of benefit, as well as the awareness of the top management of the problems that they are facing and the solutions they implemented.

II. Risk monitoring

The data analysis placed risk monitoring into two different practices with different relationships and with KM activities. The first practice is the routine risk monitoring, where all risk information and mitigating plan are updated and re-evaluated on a regular basis. The

www.manaraa.com

frequency of risk re-evaluation is determined by the nature of the risk. The second practice is the *ad-hoc* risk monitoring process, contingent upon emerging risks, significant changes to risk, or management requests. *Ad-hoc* risk monitoring occurs in-between routine risk monitoring. Table 4.4 summarizes the themes, practices, and findings of the interview analysis as they relate to risk monitoring.

Table 4.4 Summary of the risk monitoring analysis

Risk Monitoring theme	RM Practices	KM themes	Other remarks
Routine risk monitoring	• KMS-based risk monitoring. • Assigned risk owners to every risk. • Risk owners access the risk register and risk historical tracking. • Real-time risk knowledge sharing. • Risk monitoring requested by the management. • Use persuasion techniques and notification systems.	Knowledge storing Knowledge transfer Knowledge sharing Knowledge utilization Community of interests Community of practices Persuasion techniques Historical tracking Sharing culture Learning organization. Intellectual capital	Notification systems are critical to encourag risk owners to reevaluate risk statutes. **KMS is a better approach because it:** • Eases the risk monitoring for the risk owners and the RM team. • Elevates the quality and the response rate. • Facilitates the presentation and access to the historical data. • Makes people in-charge systematically aware of the updated risks. • Motivates the risk sharing and risk management culture.
Ad-hoc risk monitoring:	• Hybrid approach between human-based and KM-based risk monitoring. • Human interaction is used for follow-up and risk treatment planning as needed. • Real-time risk knowledge sharing.	Knowledge storing Knowledge transfer Knowledge sharing Knowledge utilizing Community of interests Community of practices Sharing culture Intellectual capital	**Hybrid is a better approach because:** • KM enables management and risk owners to identify the areas where they need follow-up, while the human interaction is used for clarification, collaboration, and planning if needed. • Save time and resources. • Give access and edit the risk knowledge at any time. • Involve risk owners in the in-relation risk and best practices identified by other individuals. • Create a sense of ownership over risks.

www.manaraa.com

Routine risk monitoring:

The majority of participants from both organizations agreed that risk monitoring is a challenging task, and it is resource and time consuming. They agreed that risk-monitoring activities are a result of the ERM process failing to perform efficiently with the current face-to-face interactions. They were all concurred that knowledge of management practices is an ideal approach to deal with routine risk monitoring, as KM would reduce the overhead that this process might need. For example, the respondents believed that risk knowledge sharing, transferring and storing play a major role to ease risk monitoring both ways, for the risk owners and the RM team. Technology can make monitoring more organized and allow risk knowledge to be stored with the historical changes that every risk has gone through.

The participants from CGU indicated that sharing their risk updates routinely and knowing that supervisors systematically recognize and are aware of the risks, makes them feel much more protected and confident to participate in the ERM process. Without dispute, they agreed that the shared documentation of the risks allows all risk owners to be aware of the risks, track the risks' performance, and activate the risk-sharing culture.

Similarly, the participants from TCCS emphasized the importance of the historical tracking of every risk. They agreed that access to this information, especially from in-relation risk owners, would significantly motivate and elevate the quality and the response rate of the risk monitoring as well as proactive decision-making. They think that employing a web-based KM to monitor activities outside the meetings would produce a more resourceful and efficient process.

Overall, KM practices are viewed as an invaluable motivation for the risk management culture. However, interviewees from both organizations agreed that accompanying KM with

www.manaraa.com

notification systems or persuasion techniques is vital to encourage risk owners to seriously reevaluate and update the risks statuses.

Ad-hoc risk monitoring:

A majority of participants deem that a hybrid approach that combines a web-based KM tool and human interaction is ideal for *ad-hoc* monitoring depending on the nature of the change. The KM tool can be the baseline and then, as needed, the ERM team can intervene and follow up with the risks that need more investigation. The participants from both organizations think that the access to the historical risk data is enabling management and risk owners to identify the areas that require further attention. The use of KM practices facilitates the communication between multiple partners to collect risk and identify needs. The shared risk documentation is seen as an essential practice that provides a profile for each risk, allowing the people involved to be aware of the dynamics and the patterns of factors around the risk. In addition, all participants emphasized the importance of assigning risk owners to every risk and enabling them to be in charge of updating and sharing the risk knowledge, thereby, transforming their level of ownership and sense of agency over risks. Many participants at CGU indicated that the nature of risks in higher education is comparable among completely different departments. One participant stated, *"I would like to know how other colleges and departments evaluated and mitigated the risks that my college is facing."* Thus, access to risk knowledge, mitigating plans and best practices of other departments are seen as essential assets to assist the risk owners' evaluation of their own risk statuses and effectiveness of their current mitigating plans.

III. Communication and Consultation

The results show that higher education institutes, more than any other type of organization, need to build a learning environment where the related risk best practices are

www.manaraa.com

shared throughout the organization. Higher education is a complex risk environment and every risk functions across multiple departments and areas. The participants acknowledged three different themes whereby KM plays a role in risk communication and consultation. The three themes are lines of communication, collaboration, and transparency.

Lines of communication:

It is believed by the participants that KM activities can be used to better the lines of communication between top management, the RM team, and the different departments. The risk reports will always be housed in a shared database, and the people in-relation will be notified and continuously integrate with them. The top and bottom levels within the higher education organization need to be aware of and informed about the risks and updates regarding emerging risks in one area, the risk treatments in place and the changes in risk levels. Therefore, having a mechanism where that type of information flows continuously between most levels is seen as the essence for ERM. Technology that aids in presenting the findings and in empowering the top and bottom lines of communication will bring awareness to the organization about the risks and create a risk culture that motivates everyone to be part of this process.

Collaboration:

The participants recognize that real-time risk sharing and access to a risk database allow top management and other involved employees to integrate with the risks from a risk treatment standpoint. They offer suggestions on how to mitigate the risks and fix them. These KM practices are seen as an excellent way to integrate the whole organization into the solution and the progress. Most of the participants at CGU confirmed that seeing other peoples' risk information would help them see parts of their colleagues' risk information that they did not think about or they failed to know they could contribute to their solution. For instance, one of

www.manaraa.com

the participants remarked "*seeing the problems associated with students in other areas and departments will help us expand or change the type of activities that we are doing and introduce new things to be part of the solution to the problems associated with other departments.* When people from different departments see all the risks associated with the organization, they will be more motivated to volunteer to be part of the solution or at least provide insight and help guide the solutions.

The participants generally confirmed that risk sharing would make people recognize that similar issues being addressed in different departments, and create a community of interests and practice. They believed that access to risk knowledge will help them develop to become a learning organization and enrich the worth of their resources. This would influence individuals to understand that they are all working toward the same goals and enhance the organization collaborative culture.

Transparency:

Overall, interviewees criticized ERM processes that tend to be more confidential than transparent outcomes. They indicated that some of the risks require organizational awareness and collaboration to be mitigated; making transparency essential to allow communication and learning throughout the organization. Countenancing agency over risks by sharing them is seen as essential to ERM. The participants at TCCS who are part of the committee that shares ownership over the ERM process believed in full transparency. They underscore that transparency is the primary method to engage the organization to use all possible resources to remedy itself and overcome problems with the minimum effort possible. However, a large number of the participants at CGU said that over-sharing might lead to unwanted results. The majority of the participants agreed that a semi-transparent approach is best, where the access to

www.manaraa.com

risk information occurs among all the departments where individuals can help, contribute, or interact with the risks. There was a discussion about how over-sharing of risk information might lead to increased anxiety or distract and confuse the risk owners.

4.2.2.2. Proposed action plan

Table 4.5 CGU Proposed Action Plan

Main Issues	Proposed actions	Concepts from KMS success model
Lack of communicating about risks and risk mitigating plans.	- Adapting a semitransparent approach to ERM where risk owners authorized to access all in-relation risk areas. - Educating the risk owners about the value of risks sharing.	Knowledge Quality
ERM process dependent on face-to-face interviews only.	- Adopting a hybrid approach to perform ERM activities between face-to-face interviews and KM practices.	Service Quality
Lack of collaborative risks assessment and risk-mitigating.	- Assigning multiple ownership to every risk. - Giving every employee who owns a risk of access to all the risks that fall under his or her area.	Service Quality
Lack of sense of agency and ownership over the risks.	- Assigning specific risks to specific employees and giving them the full responsibility for maintaining the risk statuses. - Giving risk owners access to the risks list owned by other employees under the same risk area.	Knowledge Quality
Lack of risk sharing culture.	- Educating the risk owners about the value of risk sharing. - Implement KM practices to encourage them to participate in the risk-sharing activities.	Knowledge Quality
Focusing on local issues within departments and offices.	- Changing the type of risks that the ERM process is looking to identify to concentrate on more holistic risks.	Knowledge Quality
The cross-functional risks re-occur repeatedly under every department.	- Giving shared ownership and access to the risks that fall under multiple departments. - Giving access to in-relation risks information to all owners.	Knowledge Quality
The ERM process is very confidential and centralized.	- Decentralizing the ERM process. - Adapting a semitransparent approach to ERM where risk owners are authorized to	Service Quality

www.manaraa.com

Main Issues	Proposed actions	Concepts from KMS success model
	access all in-relation risk areas.	
The absence of risk monitoring activities.	- Enabling fully automated risk monitoring activities through the KM system. - Perform face-to-face interviews on an*ad-ad-hoc* basis.	System Quality
ERM is very time-consuming and resources consuming as well.	- Automating major parts of ERM activities. - Sharing and disrupting ERM tasks among risks owners (decentralizing the process). - Perform face-to-face interviews at ad-hoc bases.	Service Quality

Table 4.6 TCCS Proposed Action Plan

Main Issues	Proposed actions	Concepts from KMS success model
Lack of communication within the committee members about risks beyond the meetings.	- Giving risk owners access to the shared risk registry. - Encouraging the use of KMS in between meetings to perform risk assessments and monitoring. - Educating the risk owners about the value of risk sharing.	Knowledge Quality
Lack of communication outside the committee (top down and bottom up lines of communication).	- Adapting a transparent approach to ERM where the organization members are authorized to access all in-relation risk areas.	Knowledge Quality
Lack of collaboration efforts outside the physical committee meeting.	- Encouraging the use of KMS in meetings. - Assigning shared risk ownership to risk owners inside and outside the committee.	Service Quality
Low sense of agency among the committee members.	- Giving risk owners access to the shared risk registry. - Assigning specific risks to specific employees and giving them the full responsibility for maintaining the risk statuses.	Knowledge Quality
Lack of the routine risk assessments.	- Automate the routine risk assessment activities through the KM system.	System Quality
The absence of risk monitoring activities.	- Enabling fully automated risk monitoring activities through the KM system.	System Quality
The ERM process is dependent on face-to-face meetings only.	- Adopting a hybrid approach to perform ERM activities between committee meetings and the KMS.	Service Quality
Difficulties in organizing and	- Storing all the risk knowledge in the	System Quality

www.manaraa.com

Main Issues	Proposed actions	Concepts from KMS success model
tracking all the risk knowledge.	shared risk repository. - Using the KMS to input and integrate all future risk knowledge.	
Lack of risk sharing culture.	- Encouraging the use of KMS in between meetings. - Educating the risk owners about the value of risk sharing. - Implement KM practices to encourage them to participate in the risk-sharing activities.	Knowledge Quality
The ERM process is centralized.	- Decentralizing the ERM process. - Adopting a hybrid approach to perform the ERM activities between committee meetings and the KMS.	Service Quality
The ERM is time-consuming and resources consuming.	- Automating major parts of the ERM activities. - Sharing and disrupting ERM tasks among risks owners (decentralizing the process). - Perform face-to-face interviews on an-*ad-hoc* basis.	Service Quality

4.2.3 Intervention Phase

The action planning stage set the phase for the intervention stage where the plans are transformed into actions. The researcher discussed with the top management at both organizations the proposed action plans that were generated during the problem diagnosis and action planning stages. However, the researcher authority and control over the action research intervention differs from one organization to the other. At CGU, the researcher was granted the full power and responsibility of determining and performing the intervention stage. The researcher freely executed and altered the KMS implementation according to the research results. At TCCS, the researcher's power to determine and perform the intervention stage was limited. She observed the ERM's activities and provided consultation and support to the RM team throughout the intervention phase.

www.manaraa.com

4.2.3.1. Description of the research tool

As mention previously, CGU and TCCS jointly purchased a new web-based tool called Risk Wizard to elevate the ERM process. The tool was ideal for this research as it has a range of flexibility and could be customized based on each organization's needs and requirements. The design of the tool follows the *International Risk Management Standard ISO 31000:2009* that provides general guidelines for the design, implementation, and maintenance of risk management processes throughout an organization. This tool functions like a KM System that manages risk knowledge and links, the risk owners and the organization to different sources of risk information. The tool enables risk information to be accessed quickly, easily and securely; and helps organizations share, transfer, store and utilize the risk knowledge to serve ERM objectives. The tool includes additional risk management functionalities that the researcher did not enable because they are beyond the interest of this research. The researcher activated the KM functionalities based on the results of action planning and needs of each organization.

The tool was ideal to use in this research as it is quick to learn with an easy interface, which would allow the researcher to smoothly roll out the tool across the organizations within a reasonable period. The tool would enable CGU and TCCS to list all the foreseeable events that may harm or help their business, and have these events prioritized, assessed and assigned to specific individuals. The risk owners could access their risk profile at any time with all the information about how this compares to its risk tolerance range and what action should be taken.

Figure 4.5 demonstrates the risk register view of Risk Wizard, which is the KMS portal that integrates different organizational risk information in one window. The tool provides search engines and filtration capabilities that retrieve the specific risk information in response to client queries. In addition to the register sharing, the tool offers alternative communication channels

www.manaraa.com

like emails and messaging, and provides the name of the specific risk owners, which encourages conversations and person-to-person communication. Risk Wizard includes many reporting, analysis and visualization tools that help conception and communicate the risks statue.

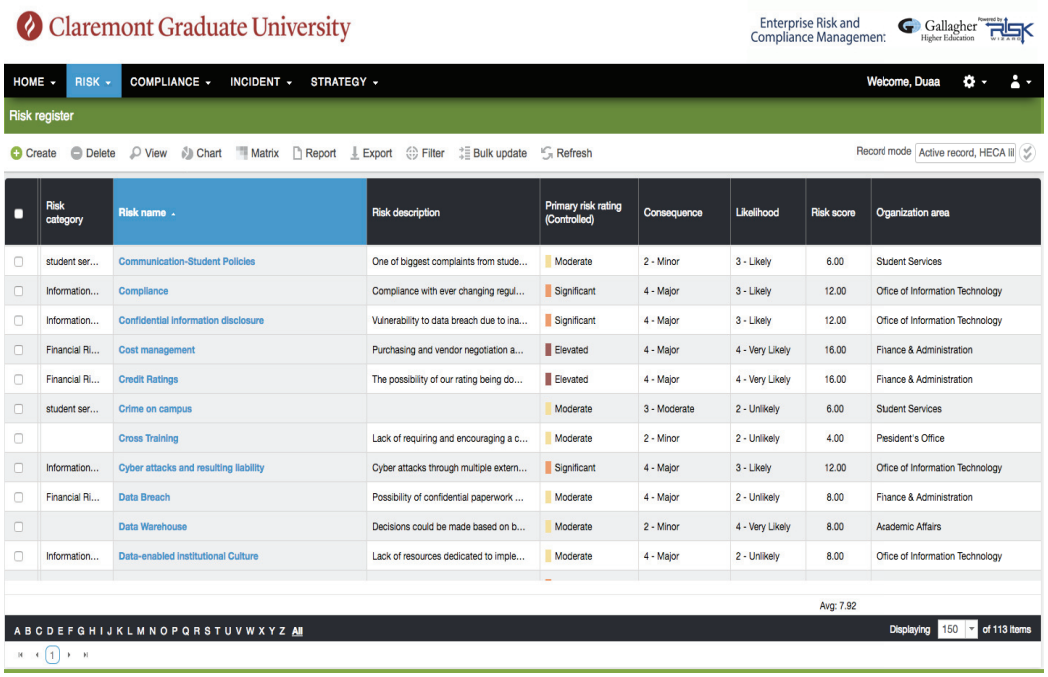


Figure 4.5 The Risk register View

Figure 4.6 and 4.7 illustrate a risk profile example with the different sub-sections dedicated to collect necessary risks information. The labels and sub-sections were reviewed and customized to CGU's and TCCS's needs. In addition to the risk information, the risk owner can add links, attachments and all types of notes to the risk profile. The tool provides a built-in messaging system to communicate within the tool about the specific risks. The tool provides a historical tracking tool to track the changes that occur in every risk. The ERM team used the risk ownership subsection to assign risks to specific departments and in-charge risk owners.

www.manaraa.com

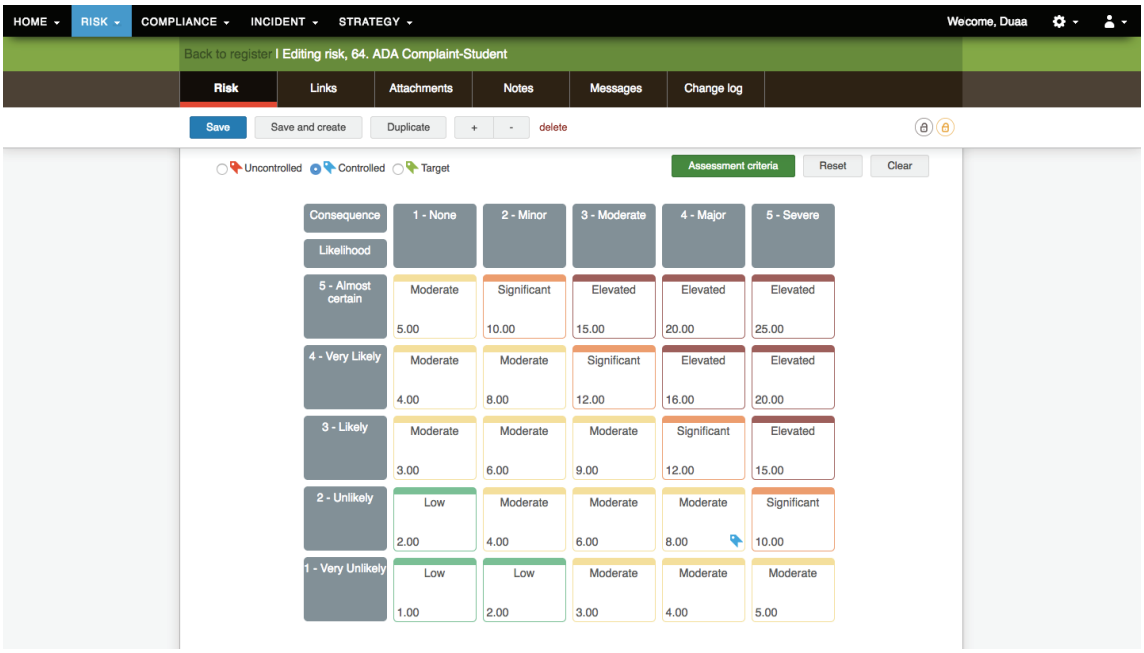


Figure 4.6 Risk Evaluation View

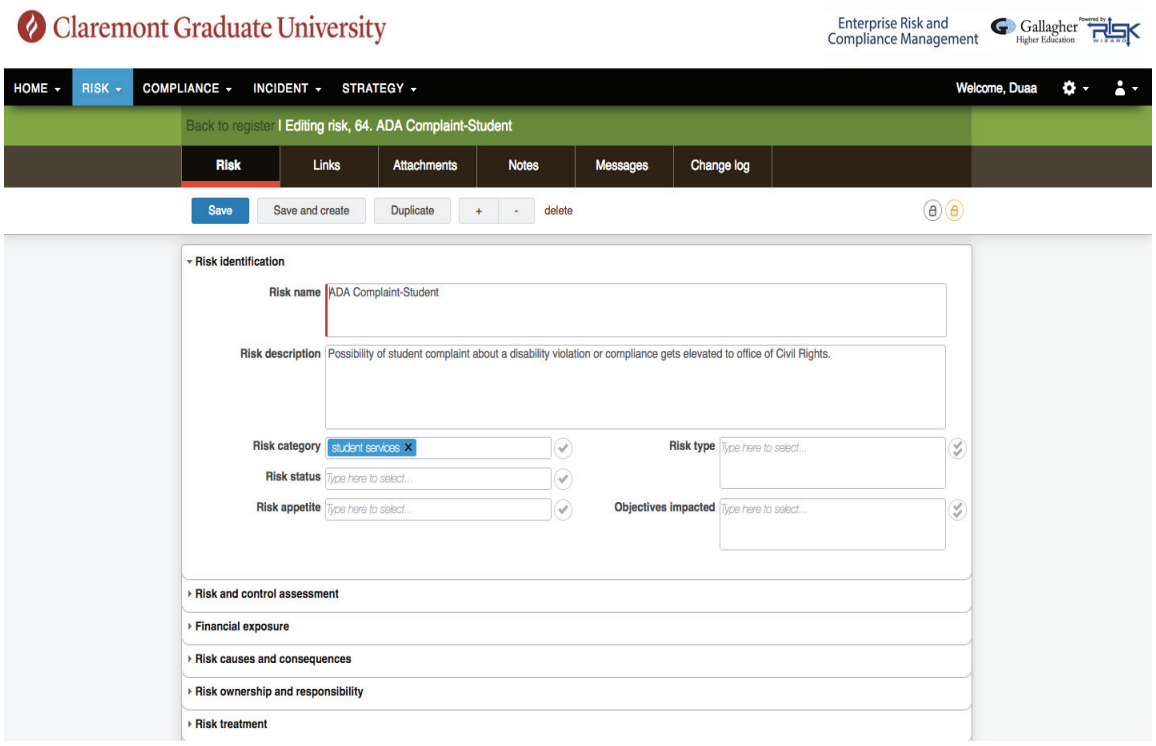


Figure 4.7 Risks Identification View

www.manaraa.com

4.2.3.2. CGU's intervention

As mention previously, the researcher was responsible for CGU's transition to the KMS. CGU's top management examined all proposed plans to initiate a KM implementation. The researcher executed and translated the plans into practical activities to reflect CGU's needs identified in the action planning stage. Table 4.7 provides a summary of TCCS's intervention goals.

Table 4.7. CGU's Intervention Goals.

CGU issues	Intervention Goals
Communication	1. Enable semi-transparency and provide ongoing access to in-relation risk information. 2. Improve communicating about risks and risk mitigating plans at two levels: - Among the risk owners within every individual department or risk area. - Between risk owners and CGU's top management.
Collaborative	1. Enable collaborative risk assessment. 2. Enable collaborative risk-mitigating. 3. Improve the sense of agency and ownership over the risks. 4. Promote a risk-sharing culture (reduce anxiety over sharing risk information).
ERM process	1. Provide ongoing access to risk information. 2. Enhance the efficiency of ERM activities concerning time-consuming issues and slow progress. 3. Enable and automate risk-monitoring activities. 4. Encourage voluntary risk assessments. 5. Promote risk-sharing culture.

According to the results from action planning, a hybrid approach is ideal for conducting the risk assessments. As a result, the researcher kept performing face-to-face risk assessments with the newly identified risk owners, while planning for the technology-based risk assessment. The researcher communicated with Risk Wizard's CEO to request customization and support. During the intervention, the researcher met regularly with Risk Wizard's technical team to get customization feedback and training.

www.manaraa.com

The busy schedule and the limited availability of the risk owner made it impossible to conduct group training. The majority of the risk owners are the provost, deans, directors, and high-level administrators. The researcher scheduled a 15-minute meeting with risk owners to train them individually. They arranged additional training sessions based on the risk owner's requests. The researcher had an open door policy with respect to the RM project and provided technical and administrative support throughout the process. They used the training session to examine system errors and fulfill any obligatory.

The researcher distributed the user access to the tool in two stages. The top management access to the tool was delayed for three weeks after it was given to CGU's risk owners. The goal was to persuade and encourage the risk owners to edit their risk register and interact with the tool before the top management received access. The risk owners were given this time to review and edit their risk register. They were asked to reevaluate the existing risks and identify any new risks as well. The focus of this stage is to improve the communication issues related to risks. However, the researcher monitored and tracked the changes that the risk owners were making to provide support and collect feedback. The researcher continuously met with the VP of Finance and Administration to provide feedback and confirm the research progress. Table 4.8 summarizes the intervention activities at CGU.

Table 4.8 Summary of the Intervention Phase at CGU

Key step	The plan	The intervention
Tool customization	Customize the tool to: - Resolve the cross function risks issues. - Match the risk terms used at CGU. - Include all the fields that CGU's ERM requires. - Give different levels of transparency to every employee.	- The researcher communicated with Risk Wizard to request customization and support. - Risk Wizard's technical team customized the tool to include an "Aggregated Risk Rating" field and add some missing fields. - The researcher collaboratively with the client created a "user permissions tree" to assure appropriate semitransparency. - The researcher provided customized

www.manaraa.com

		access to every risk owner in-relation risk areas.
Upload therisk register	- The risk register needed to be accurate and reflect the information provided by the risk owners to ensure accountability and risk ownership. - The risk owner must be assigned to the risks they own and risk areas that they can support.	- The researcher uploaded the risks list from the Excel sheets and categorized every risk by area. - The researcher created a risk portfolio to every risk and uploaded the risks' basic information. - Every user was given shared ownership of the risks that they own. - The researcher confirmed risk ownership and access preferences with every user.
Implementation and training	- Potential users of the system need to be trained on how to use the system best. - Risks owners must review and confirm all the risk information. - System users must perform another risk assessment through the system.	The researcher generated usernames and passwords and disrupted them among risks owners. The researcher schedules an individual training session with every risk owner. **Before the using training sessions:** - The researcher provided additional training sessions and "technical and administrative" support whenever needed. - The researcher used the training session to receive early feedback and adjust the system and the plan. **After the user training session, the risk owners were asked to:** - Review all information within their risk area. - Review and edit their risk portfolios. - Fill-in the missing information. - Conduct e-risk assessments around where they re-identify the current risks' status.

4.2.3.2. TCCS intervention

After collecting the information through the diagnosis stage and deliberating on the action plans, the researcher met with TCCS's top management and ERM team to discuss the research intervention. The two main differences between CGU's and TCCS's intervention plans are the transparency level and balance between face-to-face communication and technology-based communication. Although the researcher was not involved in the practical part of the

www.manaraa.com

intervention phase, she attended all the committee meetings during the study, discussed the research progress, and obtained feedback from the ERM team. Table 4.9 provides a summary of TCCS's intervention goals.

Table 4.9 TCCS Intervention Goals.

Client issues	Intervention goals
Communication	1. Enable semi-transparency and provide ongoing access to in-relation risk information. 2. Improve communications at three levels: - Communication within the committee to stay informed of the changes, and contributes to the process beyond the meetings. - Communication with the top management about the risk priorities and mitigation plans and actions. - Communication between the ERM committee and the employees' in-relation to risks within every department.
Collaborative	1. Increase the sense of agency over risks among committee members. 2. Increase the involvement of risk owners outside the committee members. 3. Increase collaboration efforts in regard to risk evaluation and mitigation outside the physical committee meeting.
ERM process	1. Establishing automated monitoring activities. 2. Improve the routine risk assessment activities outside the committee meetings. 3. Advance the ERM administrative process as follows: - Improve the organizing and tracking of all the risks knowledge. - Maintain consistency regarding technology use and risk register formatting. - Reduce the complexity and time spent to perform all aspects of the ERM process.

In this case, the problem diagnosis indicated that there were no duplicated or cross-function risk issues with the TCCS register. The tool was entirely ready for KM implementation at CGU. As a result, TCCS was not involved in any tool customization requested from Risk Wizard. CGU's entire risk register was given to Risk Wizard's technical team to upload it to the

www.manaraa.com

tool. The team was fully responsible for all technical support to maintain TCCS's risk register. The ERM team continuously evaluated the risk register upload to confirm accuracy.

As motioned before, the ERM process at the TCCS was conducted through committee meetings, wherever member represented a major department or risk area (see Figure 4.8). The TCCS risk management team was originally planning to use the tool as a centralized risk database that facilitates risk information tracking and to grant access to the members without individual risks sharing tasks. They were planning to keep using the meeting as the only risks information source.

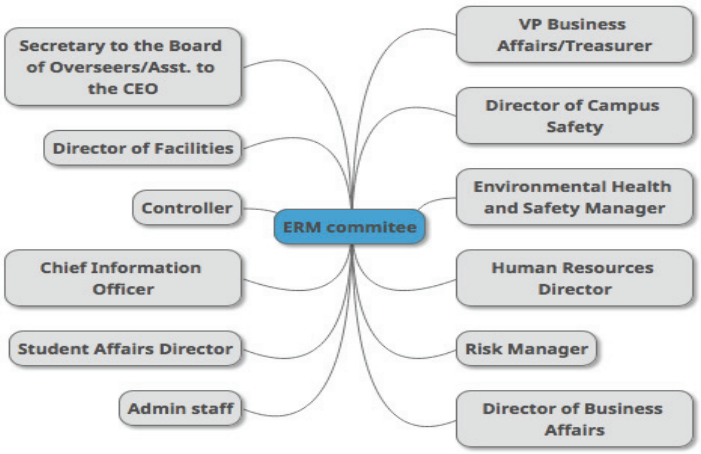


Figure 4. 8 TCCS's ERM Committee Structure

However, based on the action planning feedback, the ERM team agreed to decentralize ERM activities and use all aspects of the KMS. The action plan suggested that the face-to-face conversation must work in parallel with the technology-based risk communication. Every member was given access to the system and the overall risk register. They were further assigned to their specific risk areas. The members were encouraged to access and interact with the tool in between committee meetings. They were asked to monitor and re-evaluate the risks under their areas outside the meetings. The ERM team used a committee meeting to train the members on

www.manaraa.com

the tool and to resolve any disagreement about the components of the risk register. To demonstrate the risk assessment practices, they used the tool in front of the members to input the information identified during the meetings. The ERM team provided support and individual training outside the committee meetings. The top management at TCCS was given access to the risk register. The members were encouraged to share the risk information with in-relation employees under their specific departments.

Table 4. 10 Summary of the Intervention Phase at TCCS

Key step	The plan	The intervention
Upload TCCS's risk register	- The risk register neededto be accurate and comprehensive. - The risk owners must be assigned to the risks they own. - The risk owners must be granted access to the TCCS overall risk register.	- Risk Wizard's technical team was in charge of uploading TCCS's Excel sheets into the tool risk register. - The ERM team continuously reviewed the risk register to confirm accuracy. - The ERM team used the tool during the committee meetings and input some missing or new information to the register as a group. - They created a risk portfolio for every risk and uploaded the risk's complete information. - The ERM team assigned risk owners to every risk area.
Implementation and training	Potential users of the system need to be trained to use the system. Risk owners must review and confirm all the risk information. System users must perform another risk assessment through the system.	- The ERM team scheduled in aperson training session with a representative from Risk Wizard. - The ERM team generated usernames and passwords and distributed them among the committee members. - The ERM team conducted the group-training session during one of the committee meetings. - The ERM team arranged individual training sessions on-demand. - The ERM team used the tool during the committee meetings to review the register as a group. - The committee members were asked to review, edit and confirm all information within their risk area after the committee meetings. - They were asked to conduct e-risk assessments around where they re-identify the current risk statuses.

www.manaraa.com

However, three main members of the ERM committee resigned, and the committee activities were put on hold temporarily until the TCCS replaced them. The remaining members continuously worked on the assigned tasks and their efforts focused on mitigating the areas that were determined to be the highest risks. They kept documenting these efforts in Risk Wizard until the resumption of the committee meetings. This hold forced the researcher to terminate the intervention phase at TCCS at this stage. Table 4.10 summarizes the intervention activities at TCCS.

4.2.4. Evaluation

A combination of two evaluation approaches was used to examine the perceived value of the implemented tool. In addition, the evaluation stage practically confirmed the assumptions about the relationship between ERM and KM during the diagnosis and action planning stages. The first part represents the research evaluation acquired from the researcher's observation of the changes in the work environment and their participation in the process. The second part of the tool evaluation was performed through the use of semi-structured interviews. The interviews were conducted with all the risk owners who were trained and used the tool during the intervention phase.

4.2.4.1. First evaluation phase: The project observations

CGU:

As discussed previously, the researcher is formally performing and supporting all ERM activities at CGU. During the research stages, they continuously observed and collected notes about the employee attitude, work environment transformation and changing dynamics of ERM activities. The observations cover: CGU's management attitude and feedback after being

www.manaraa.com

introduced to the tool, the risks owners' reaction after the training sessions, and the changes in the work environments a result of the access to the tool.

Management feedback:

CGU's management was very supportive of the new ERM process introduced in the first research cycle. The Vice President of Finance and Administration met with the researcher on a regular basis to receive feedback, review the progress, and plan for the next move. The Chair of the board of trustees, who has much experience in ERM, joined the meetings on multiple occasions. They were very excited about moving the process to transparency and a collaborative environment. However, they were not sure how effectively the new tool would serve CGU's needs and how the employees might react to their new responsibilities.

Following the customization of the tool and the uploading of CGU's risks registry, the researcher scheduled a meeting with both of them to introduce them to the system. The meeting began with an introduction to the system and initial training. The researcher explained each feature in the system and explained how it allows a range of flexibility in terms of granting authorization, transparency levels, risk ownership and collaborative activities. The researcher explained that the system is multilayer and has many other features that were not being used at this stage of implementation and could be enabled in future stages. Later, they engaged in discussion with the researcher that lasted for a half hour. The researcher recorded and transcribed their responses and reactions.

The immediate reaction, in this case, is that they were relieved that the tool interface is user-friendly and easy to navigate, as they felt these are critical factors in producing high utilization and acceptance among the users. The respondents showed some concern about how overwhelming the organization's list of risks appeared. The researcher explained that this list is

www.manaraa.com

from an administrative view which provides access to everything. She logged-in with student a affairs user id to show them how the system will look from the user view. The following feedback and concerns where noted, after navigating the system together for a while.

They were very excited and motivated to monitor how the risk data will change after enabling the tool. They discussed how gaining access to risk knowledge continuously would encourage them to allocate more efforts and attention to the process. They believed that the use of the system will help CGU to create an organizational memory in regard to risks where they can see patterns of issues that keep occurring and have been tough to mitigate, instead of only emphasizing on the risks with high scores. In addition, they liked how the system consolidates all risk information in one place to activate collaboration.

The Vice President of Finance and Administration stated, "*Allowing colleagues to see each others' issues and plans will encourage them to knock on doors and start conversations about risks.*" Both thought that the ERM team needed to be cautious about giving the users the full freedom to edit and change the values of the already identified risks. They suggested activating notification alerts of any changes made through the system. They recommended assigning multiple risk owners to every risk, including the higher-level administrators who supervise each area to encourage more realistic and accurate risk assessment and monitoring. These suggestions with other observations were considered during the intervention stage.

Training reflections

As mentioned at the intervention stage, the researcher scheduled individual training sessions with all the risk owners who are part of the initial implementation of the system. There were a couple of cases where the risk owners showed resistance to the training, mainly due to issues with RM culture and lack of belief in the purpose of this process. I was forced to request

www.manaraa.com

the involvement of the VP of Finance and Administration to encourage them to participate and learn about the importance of the use of the system. The risk owners' immediate reaction to the tool was generally positive. The majority agreed that the system interface is user-friendly and easy to use. The following remarks and observations were gathered during the training sessions:

Access to their own risk information

- The majority of the risk owners asked the researcher to teach them how to access their own risks first. They immediately commented on the number of risks that they owned. They approved their ownership over some of them, discussed how they collaboratively own them with someone, and explained how they can claim the ownership of other risks.
- Some of the risk owners started editing the risk content during the training session. They asked about who can access their risk knowledge and how much time they have to review their risk information before the top management accessed it.
- These individuals had serious concerns about the type of the information they are allowed to share through the system. They were informed that there is no confidential information allowed in the system. As such, general support and satisfaction were received because of this type of access.

Access to other peoples' risk information

- Risk owners directly browsed the risks that they related to or were curious about them. They discussed with the researcher their knowledge about the subject or how that related to some of the risks they identified.
- Some of them claimed the ownership over some of the risks and were not sure why they did not own some of the other risks in the risks registry. The access to the risks registry enhanced the sense of ownership over the risks.

www.manaraa.com

- For analysis purposes, the risk owners were given access to nonrelated departments' risk register information. Most of them were overwhelmed with the access they were given, and indicated that this access created a distraction and was unnecessary. This supported the semitransparency approach that was identified during the action planning stage.

Work environment observations

The researcher performed and participated in all ERM activities, which included committee meetings, risk discussions, board of trustee meetings, and assessments evaluation sessions. The researcher kept asking the risk owners questions about the status of the ERM process, discussing future plans and assessing the changes in the their work environment. The observations resulted in the following points:

- The employees, who were chosen as risk owners and granted access to the risk register, started to ask questions about the process and risks. This move showed their interest and willingness to participate in the process. They began to gain more understanding of the process. They inquired about things like how often they need to re-evaluate risks every year, how freely can they edit existing risks or identify new risks without confirming with ERM representatives, and how freely can they alter and change risk ownership.
- The researcher observed major collaborative efforts that were activated through the use of the system. For example, in the student affairs department, many employees started conversations about how they can contribute to the assessment, monitoring or treatment of the number of the risks that they did not own. The student affairs office formed regular meetings to discuss issues with cross-functional risks, negotiate about risk ownership, organize the risk management activities, and maintain collective ownership over the department risks list. Another example is collaboration between the billing unit in student

www.manaraa.com

affairs and the financial department. The risk owners at both ends started conversations about the shared risks and formed a meeting to discuss the risks list. The top management became more involved in the ERM process. They requested more meetings to review risk results and discuss plans. The top management became more aware of the status of the departments in regard to risks. The level of collaboration between ERM representatives and the top management to fix ERM issues and maintain the process increased significantly.

TCCS:

The researcher participated and observed part of the ERM activities at TCCS. The researcher attended all ERM meetings during the study. The researcher kept asking questions about the status of the ERM process, discussing future plans and assessing the changes in their work environment. In the committee meetings, the systems were introduced and used; the researcher gathered the following remarks and observations:

- They were satisfied with the ease of use and friendly interface of Risk Wizard. General support and satisfaction were perceived because of this type of access.
- They generally liked the convenience of the web-based access that this tool provides.
- They discussed how complex it was to request access to one of Excel risks sheets.
- They discussed how they rarely gain actual access to any of the risk information beyond the meeting, though TCCS is open about sharing the risk register with the members.
- When the ERM team demonstrated and performed the risks assessment through the system, the committee members paid more attention to the process, andasked more questions about the risks and the evaluation measures, compared to the meetings with open discussion risk assessments. In addition, sometimes they expressed confusion about risk evaluation measures, which were continuously used during all the previous sessions, and demanded an

www.manaraa.com

additional explanation from the ERM team. This shows that levels of consideration and responsibility over the practical contribution to the process had increased.

- A couple of members expressed that they were overwhelmed with the access they were given to the risks that they could not understand or contribute to them. However, they appreciated the access to the risk information in relation to their area.
- The number of items discussed during the meeting had increased as the committee assigned tasks such as gathering information about the risks, evaluating mitigating plans and confirming risk statuses to the risk owners to be conducted after the meeting.
- The committee meetings before implementing the system were led by the ERM team who ultimately controlled the meeting agenda. The leadership of the meeting shifted after access to the tool was provided, as the members were prepared with a list of concerns and items to discuss with the group.

4.2.4.1.Second evaluation phase: Reflective interviews

To further evaluate the importance of the system and confirm the findings from the first two stages, the researcher conducted another inquiry in the form of semi-structured interviews with a sample of the system users. As mentioned in Chapter Three, the primary goal of these interviews was to explore how the KM systems, which are the research intervention, changed, fixed, or addressed ERM issues discussed in the first phase. The researcher developed an instrument to guide the interview process, which was designed based on the research framework. It was also based on the Jennex and Olfman (2004) KMS Success Model, and primary findings from the first two stages. The instrument was divided into four parts as described in the next subsection (see Appendix 2).

CGU interviews:

www.manaraa.com

The interviews included 12 participants who are members of five out of eight risk areas within CGU's risk register. The criteria to choose the participants for this phase were as follow:

- They were part of the ERM process before the KM intervention.
- They owned more than one risk under the risk areas that were part of the intervention phase.
- They had access to the systems.
- They received training and support to use and understand the system.
- They were given time to use the system, update their risks and comments, and evaluate other risks within their areas before the interview.
- They agreed to be part of the interview process.

The following section presents selected responses received from the participants, to demonstrate the overall feedback and evaluation.

1. General feedback:

What benefits did you expect to see and experience as a result of using the Risk Wizard system?

> *I expected to obtain the tool that provides a systematic approach to tracking, monitoring and reporting on the risk that threatens the university's different departments.*
>
> *I thought the system would provide a list of risks, and I expected the system to allow some reporting. However, I did not know how it would function. I knew that the system would have some visualization ability like heat maps because we used to do that in Excel. I also expected that it would allow us to store all the risk information where we could access and see how they changed all the time.*
>
> *I expected a system that would help us make the process more regular, easier and timesaving. I hoped to have a tool that would help us avoid scheduling meetings with the ERM team to report and discuss risks. I wanted to be allowed to go back and quickly edit the part that I wanted.*
>
> *From what you had explained to me in our first meeting, I expected the system to decentralize the ERM process as compared to the centralized approach. I assumed that*

www.manaraa.com

we would maintain our own risk and we would have the ability to create our risks lists, monitor them and update our policy, and identify the areas where risks are occurring and how to deal with the risks.

As you become involved in the KM system, did you discover other reasons for using the system that you did not initially anticipate?

I knew from the theoretical standpoint that the system was going to help us perform ERM processes electronically. However, I was surprised at how powerful it was in helping us track the risks' historical data. I was impressed by the ease and flexibility that this system was offering.

The system was straightforward and easy to use. The menu was really simple. I liked the fact that I could filter the risk register and the risks list according to the information I needed. I liked the way I could see the different categories and the color-coding to recognize the risk priorities and levels. I liked how the system allowed us to access the risks related to other departments where we could be able to help.

I was really pleased to be able to track my own risks, which falls under my responsibility. The system allowed me to go and edit the information to make sure that it reflects the reality and represents my experience. Additionally, I liked the fact that the system allowed me to see the risks that other people have. I was able to identify the common issues, and the common treatments plan that cross-function between their risks and my risks.

I was not expecting the transparency that this system facilitated. I was regularly able to review and access my whole department's risk information. I think the decentralization approach to conducting the risks assessment through the system provides a faster and a more efficient process. When the management requested me to identify and review risks through the system, I was surprised how convinced and assured I felt.

I did not know how to approach it, because we are learning as we use it. Actually, I got more than what I expected after I used it.

2. System quality:

What did you like and did not like about the tool?

I liked how the system worked as a comprehensive resource that put all of the university risks on a shared platform that it provides in relation to information from different individuals. I liked the up-to-date risks communication. The tool helped us start collaborative plans regarding risks and edit our work description to include the risks associated with our positions. The negative side of the system was that the application

www.manaraa.com

was so intense and can be overwhelming. I think we will need time and more training to get used to everything related to it.

I liked the transparency and decentralization where you can focus on the top risks associated with the different areas. The system is very accessible and provides a convenient way to explore multiple angles of every problem. I like the charts that give you more data, and you can analyze by yourself. I like that you are available to look at the information over time. The only negative thing that I can think of is how difficult it is to follow and remember the ways to navigate the information, maybe because it is still new.

It was easy to use. I liked it in general. The system was easy to navigate. However, I did not understand all information on the system and I did not like that I had access to the risks that are not related to me. I think it is confusing and unnecessarily.

It is easy to use. I like having the ability to add myself to the risks I can contribute to them own or update the risks I own. I like the easy access to the information that this tool is providing. However, I dislike extensive information and features that I may not need.

When first you trained me how to use it, I thought it is really simple, but next day when I wanted to use it alone, I felt overwhelmed and confused. I think I will need time. I did not understand some parts of the tool.

I did not like how there are layers within layers, and the user needs to expand these levels before viewing the risks information. I would like the first interface to show my risks only. I like the colors and design. I like the filter feature where I can navigate the information related to multiple people, departments, and areas according to what I need.

From an efficiency perspective: What is your evaluation of the use of the systems to conduct ERM activities compared to the previous human interaction?

We used to have full-time staff members that have to interview people, transcribe the notes of the meetings and then create Excel sheets that represent the information. The process was using 75% of their time and work efforts. The process was slow and problematic. This system allowed us to eliminate almost a complete staff person. Now we can request everyone through the system to update their risks and then have the executive team review the updated risks for any needed actions. The new system allowed us to conduct a comprehensive risks assessment round in no time. We are now capable of saving time and reducing the resources needed to perform the process. If there is a need for personal communication, then the human interaction will be present.

The use of this tool is convenient and efficient. If there is a risk in my office, I will immediately communicate about it, and everyone will be informed about it and can contribute to the necessary changes.

www.manaraa.com

The former system relied on one person and no one felt any sense of ownership over the risks they possessed. This system empowers the sense of responsibility over risks and encourages the mitigating actions. That the system, as well, improved communication between different offices in the same risks area is commendable.

The system gives us the full picture of our status and the statuses of the offices where we can help. The previous process was too confidential and felt like dealing with risks is a role of someone else.

I think the information that we have with this tool will lead us to a better direction and hold us accountable. Now, we can track better and can see the history of any action that has been taken. Anyone around us can track the change that we make to support us or to get our help in dealing with similar issues.

This system, in general, is more efficient than the previous process. I am now accountable about everything I included in my risk register. The shared ownership over risks encouraged us to contribute to the process and made sure that our register reflects the reality and is very comprehensive.

Additionally, if someone from the ERM team forgets to write down the information discussed in the interviews, the knowledge will be lost. I think keeping the risks knowledge in a shared database helped us maintain the knowledge and make it available for us continuously as a reference to what we need to fix and how we do it.

3. Knowledge quality:

Knowledge storage: How do you think your ability to access the organization risk knowledge and historical changes reformed your experience and involvement in ERM?

Individuals come and go in every institution and keeping this knowledge in an accessible environment will maintain constant awareness of the risks and mitigating needs.

The information access allows me to have a holistic view, at the top level of all different risk surrounding my work environment. As an administrator, I often request access to the risks information in the Excel sheets. I see the transcription of the interviews but the information is not actionable to me, not categorized and I do not know how to use it. However, the access provided by this tool allows me to realize the enterprise view of risks and see the different categories to find what I need immediately. I can pick the top risks and prioritize the mitigating efforts for the year.

The access allows us as an institution to maintain a stable ERM process. When people leave the institution, the new people will immediately become aware of the existing risks and the previous efforts.

www.manaraa.com

The access enables us to know what everybody else is doing compared to the view of our individual perspective. Now we do not have to ask anyone what is going on as the information becomes readily available and accessible. Access to information is the key for collaborated achievements.

The access encourages us to start conversations about risks with each other that we never had before. The access to risk information educates us about the global ERM and establishes cooperate mitigating efforts.

Knowledge sharing: How do you think your ability to share your risk knowledge personally changed your perspective of ERM process?

My ability to change my risk register and share my updates is essential and more efficient. In the past, I would have to talk to ERM staff if I have an update and my updates usually are not consistent as I am not aware of the recorded historical information. My experience with ERM is entirely different after the tool.

The ability to share risks and access other people's risks is a great practice that keeps me and others accountable. It keeps us updated and aware of where we are and what we already did.

Knowledge sharing changes my perspective in several ways. It makes me appreciate other people's experiences about their risks.

I have the habit of trying to find what is going on and where we can improve. The access provided by the tool facilitated that and enabled us to act quickly.

I think the access to risks knowledge is keeping us more alert to monitor changes. We are now more aware of the monitoring needs, and we can answer questions about risks that we did not know before. We started to prioritize risks and plan and strategize about how to handle ERM exercises under our care.

The current knowledge sharing activities enables us to empower our efforts to overcome the existing issues. For example, the notification system will allow me to be aware of the change in the risks value immediately. I am able to communicate about the reasons that led to this change and maybe fix them straightaway. We are now able to react quickly. The system will also allow us to identify patterns throughout the whole university and identify risks that we will never recognize individually or warn us about the areas that we need to look at.

www.manaraa.com

4. Service quality:

In your opinion, how effective do you think the Risk Wizard system has been in:

- **Encouraging ERM members to engage in higher-level thinking about risks?**

- **Enabling collaborative risk mitigating?**

The tool enabled all the risk owners, even the ones at the bottom level, to recognize and understand the enterprise point of view of risks. Their future risks assessments will fit more with the organization's overall risk profile. The people will start thinking more strategically. On the other hand, the tool enabled the executive team to understand the specific concerns of each department. Someone from the local level might believe that something is very risky. But if they looked at it from the enterprise level and compared it against the other concerns within the university or the department, the evaluation of those risks' urgency might differ. The system helps us to think more strategically about risks.

The tool is leading to collaboration efforts in ways that we did not anticipate. There are a number of internal department meetings and committees that were formed to discuss risks and group themselves to plan for mitigation. I believe that this happened because people now have more data than they had before.

In the executive team level, the tool led to collaboration efforts. We started to see the risks that different departments go through. A risk might be owned by one area but it might lead to other risks within a different area. I think this directed us to more conversations than what we had before. Initially, what we were doing was just a report. Now we have a clear collaboration process.

The turnaround in our department after using the tool was very quick. It took us two weeks of access to each other's risk registers before we requested a meeting to discuss the risks issues collaboratively. We used the meeting to rearrange the risks ownerships and share the risks among us. We reevaluated the risks and prioritized them from a higher overview. The meeting helped me understand the different view of every risk coming from every one of my colleagues. We usually talk about risks, but now we are collaboratively planning and acting on them.

The tool helped us identify a priority as a department. We then discussed how often we need to reevaluate or review every risk. The decision was a group decision, and everyone will thus be held accountable for it. The plan is to set a fixed agenda for Risk Wizard activities and to deal with these risks as a department. The tool will start to incorporate our regular yearly business processes. The tool itself will become a new area in our job description. We started to switch gears concerning the university culture.

I think it is a very useful tool that allows me to think beyond my own office and to think how other offices are cooperating in their responsibility, how they are working on certain

www.manaraa.com

strategies and how they are trying to protect from any source of risk. You do not have to be there to see all their experience and use their knowledge. However, this tool allows everyone to have access to their knowledge.

5. Transparency and risks ownership:

How have transparency and access to other people's risks changed your experience and involvement in ERM?

I am big believer of transparency and I think we will get more transparency in the future. Risks are almost always crossing different departments. There is no way to deal with them individually. Every department owns a piece of every risk. Transparency is the only way to solve the critical issues with the ERM process. We should all be mitigating all the university risks and not only the risks assigned to us. For example, everybody should be a recruiter and an advocate for the students and not only the student affairs personal. As an individual, the more information I am given, the more I will act as an advocate of the whole university and not just an advocate of my department.

Transparency within departments enabled the different individuals within this risks area to work together in the team. The actions are in regard to risks owned by the groups, not the individuals.

Transparency fosters and approaches solutions across fields and departments. Openness made us less defensive of the problems under our areas. Initially, I feared to report some of the risks thinking that it would look like I am not doing my job. The access to risks knowledge educated my colleagues and I about the purpose of the process, which is to work to mitigate risks collaboratively. My awareness of the risks associated with other individuals and departments reduced my insanity over risks sharing.

It has been a short period since we started using the tool. Therefore, giving you a practical reflection about transparency will be difficult. However, I think transparency is critical, when it is necessary to be effective. After reviewing the student affairs risks with my team, I became more encouraged to request for any number of my employees to access the academic affairs risks related to our work. I think access and transparency will help us to solve multiple issues together and to use the efforts of other people towards solving out problems.

How has risk ownership changed your experience and involvement in ERM?

The more we give ownership, the more we feel responsible. The fact that I possess some risks in the risk register made me want to do more things about it. I am, therefore, encouraged to report more risks information, think of more creative and effective risk

www.manaraa.com

mitigation plans or at least elevate it to the people who can do something about it. Ownership is empowering us and making us feel that people are aware of our efforts.

When you give ownership to the people, then they feel more responsible. In the past, if people noticed something risky, they did not report or try to fix it. But when they are the owners and see that risk, they will try to report it and fix it. If you are the owner, you will be judged about what you are doing. As a result, you will try to elevate it. Ownership makes the people feel better in their job, because they own the act and it gives the people the power to do better.

Ownership gave me the feeling that I am not the one that has to solve the risk but I am a lead person to own the risk and maintain the status of the risk. The point of contact is the main point of ownership. Ownership made me feel encouraged to keep asking about the mitigating progress, which stimulated the involved parties to try to make progress about the risk.

I think the ownership of the risk makes us involved, be more accountable and engage us more in the process. Initially, we just had to report the risk status. This was if somebody asked about it and we did not know whether they wanted us to do something about it or not. Risks ownership made us feel like we needed to do something about the risks and make a difference and motivated me personally to keep an eye on my risks.

TCCS interviews:

The interviews included three participants who are members of the ERM committee.

The criteria to choose the participants for this phase were as follows:

- They were interviewed in the first stage of the research.
- They have been part of the ERM committee for a long time.
- They were given access to the system.
- They were trained about the system.
- They updated and worked on the risk register within their areas.
- They attended one of the committee meetings after the implementation of the system.

1. General feedback:

What benefits did you expect to see and experience as a result of using the Risk Wizard system?

www.manaraa.com

I hoped that the system would help us streamline the process and help us coordinate ERM activities. I hoped that the system would ease the administrative part of the ERM process and reduce the resources and the time needed to coordinate and collect information.

I was anticipating that we would have a tool that would allow us to organize and store the information gained from ERM. I thought that the system would facilitate our ability to track historical changes in risks.

As you became involved in the KM system, did you discover other reasons for using the system that you did not initially anticipate?

I did not know that the tool would provide a historical analysis of the risks that the information shared. It is impressive that the tool is now allowing us to capture our developing thought process surrounding the risks.

I think that there is a lot of assistance in terms of taking the process to the risks treatment and planning spectrum. I was surprised at how the system helped us in keeping track of our data and keeping our data accurate and consistent. I have been pleased with how this tool is helping us acquire clean historical tracking of data. In the past, this process was complicated and a one-man job.

2. System quality

From an efficiency perspective: What is your evaluation of the use of the system to conduct ERM activities compared to the previous human interaction?

The tool made ERM activities more efficient. The data is shared among the risks owners and many people are contributing to the input process. Many people are now contributing to the reviewing process and multiple people own every risk. Even from an administrative and organization perspective, the information is kept categorized. In the past, everything was done manually, where the member responsible for capturing the data took the raw data out of the meetings' open discussion and transformed it into Excel sheets. This process was complicated, with a large room for mistakes. Previously, there were a lot of overhead costs on the administrative members to maintain the different aspects of the process and ensure accuracy. Presently, we identify and evaluate risks systematically, and the technology does the job for us. In addition, the use of this tool helped us as a committee to cover more risk areas at every meeting than what we could do previously. The members now come to the meeting aware of the risks and a number of tasks are accomplished in advance outside the meetings.

www.manaraa.com

Here in TCCS, we believe in human interaction to conduct the process, and I think that the tool works ideally with that. Actually, the tool helps us to have more of the active interaction and enriches the conversations during the meetings. The members and the administration give more attention to the process and have a deeper understanding of the issues and the plans. The tool has facilitated the flow of the meeting discussion.

I am part of the administration team, and my attention usually goes towards capturing the information coming from the members' discussions, making sure that we cover the areas we planned to discuss. It also includes maintaining the complex Excel sheets and the historical flow of every risk. The system will help us to sustain the ERM program while lowering the resources, efforts, and cost. Presently, we are sending an individual assignment to every risk owner. The tool helps us to be more efficient in terms of time. The system also creates a baseline for all the risks that we have already evaluated so going back and reevaluating depends on the need of the specific risks to become more possible than before. The system has notification systems and a built-in email system where the communication among TCCS regarding risks is elevated and empowered. Though we believe in transparency and we cannot implement a real transparency environment, the system in itself facilitates transparency.

Knowledge storage: How do you think your ability to access the organization risk knowledge and risks historical changes reformed your experience and involvement in ERM?

Access was previously complicated, as we did not have a centralized area where all the information existed. Committee members need to know what layer of the data they need. Even accessing the accuracy sheet that they want was difficult. We now have a centralized area where everyone can obtain the risks knowledge whenever they want. The tool helped us deliver the risks to all parties. Additionally, the ease of access allows us to use the risk knowledge and utilize it to the benefit of the organization and departments.

The system enabled us to have all the risk information in one place and facilitate the search for any information that we need to perform the RM tasks or even our regular operations. I will give you an example. As you know we lost several people on the ERM committee. When the new people join the committee, they will have access to the well-organized risks knowledge in their area, the best practices, and the progress of the process. The access will help them to configure the structure of ERM activities at TCCS quickly. It is easier for them to pick up the needed experience and efficiently participate in the process.

One of the difficulties that we faced is the different definition of some risks or the various evaluations of the risks. The system allowed us to capture these different opinions and enable the member to access it and communicate with it which brought us to a far more unified process.

www.manaraa.com

Knowledge sharing: How do you think your ability to share your risk knowledge personally changed your perspective of ERM?

Moving from the isolated environment to a sharing environment helped us as a committee to enrich the sense of agency among the members, and we achieved product review of the areas of the risks assessment. The risk register now contains information that I invested time to share individually, and I transferred my interpretation of the risks from my perspective. Thus, the other departments did the same. As a result, our risk register contained broader and comprehensive inputs.

Indeed, the system helped us to overcome some of the communication and collaboration issues. Everyone has access to the system, and everyone directly or indirectly can seek other people's support.

The whole concept of ERM is sometimes difficult to understand. Some people feel frustrated with the meeting especially when we are covering issues that are away from their areas. I think the ability to share through the system helped them share their thoughts and created a sense of urgency. It also advanced their understanding of the process. The members started to see the whole picture and their continuous value to the process. I think we are following the right track here.

Knowledge use: How do you think the risk knowledge sharing helped in risk identification, analysis, and risk mitigation?

I think dividing the risk information sharing tasks among the members helped us focus more on discussing the mitigating plans, prioritize the risks, invest time on strategic discussion compared to earlier on when the meeting focused on identifying and collecting risks information. The meetings were overwhelmed with risk assessments more than anything else. The tool facilitated our efforts to move to the next step.

I think that by just knowing that all types of resources are available in front of everyone to share and use helped to improve the practical part of ERM. Previously, we were very dependent on the meeting time, where the meeting agenda was full of all types of activities. We evaluated ERM programs, identified risks, discussed mitigating options, reviewed the risks in urgent need for review, discussed concerns from different departments, and many other tasks. The use of KMS to collaboratively share risks information and update before and after the meetings reduced the level of pressure on the meeting time and allowed us to use it effectively, where the face-to-face communication was needed.

www.manaraa.com

4. Service quality:

In what way(s) do you think your new connections with people or organizations made through the Risk Wizard have benefitted individuals, organizations?

The use of the tool pushed us to identify the different connection between the risks and the different departments in the committee. We were encouraged to assign the threats to various departments and owners. The use of the tool helped us identify the different connection between departments, and we even identified the role of everyone in the development of the ERM process, treatment plans, and other related tasks. The access to the risks information that this tool facilitates helped us brainstorm more and pay attention to more issues that the committee members did not engage previously.

I do not have a definite answer to that. The system helped us in organizing the KM efforts that we were trying to perform manually. The KMS facilitated our efforts to empower different ERM activities. Now we have an active and direct connection among us as a team and between the top management at TCCS and us.

In your opinion, how effective do you think the Risk Wizard system has been in:

- **Encouraging ERM members to engage in higher-level thinking about risks?**
- **Enabling collaborative risk mitigating?**

I think the risk sharing and the transparent access to the risks knowledge opened up more discussion about the risks and involved more people in the process. As I discussed earlier, the tool worked as a facilitator of the ERM activities and increased the sense of ownership over the process. This made the discussion go more in-depth and include deeper evaluating and planning for risks.

The tools activated collaborative efforts even outside the meetings and helped to keep the thinking and planning active and alive beyond the meeting. The tool allows everyone to be exposed to what others know and the people become more committed to what they know. The ultimate goal of this process is to mitigate risks, and collective efforts are the key to that.

5. Transparency:

How has transparency and access to other people's risks changed your experience and involvement in ERM?

www.manaraa.com

Transparency is a critical component to the success of the ERM process. Transparency enabled collaboration. Transparency was an educational opportunity for everyone involved in the process and brought more awareness of the issues.

When we launched the tool and everyone started accessing and viewing the data, some members were confused with some of the risks, especially the ones far from their experience. They started asking more questions to clarify and explore the issue. In the process, they wasted some of the meeting time with unwanted discussion. However, the confusion started to decrease in the following meetings as the members became more aware of the risks.

4.4.5. Reflections and Learning Outcomes:

The main goal of this stage in the action research methodology is to discuss the findings from the evaluation stage and specify the learning from the overall previous stages.

4.4.5.1 Reflections on goals achievement

The feedback received from the respondents showed that the system has effects on the three main issues identified in both organizations. The analysis also showed that the system could support the three elements of the ERM process that this research is investigating. Table 4.11 and 4.12 summarizes the action research reflections.

Table 4. 11 Summary of CGU Reflections

Issues	Intervention Goals	Evaluation of Goals Achievement
Communication	1. Enable semitransparency and provide ongoing access to in-relation risk information. 2. Improve communicating about risks and risk mitigating plans at two levels: - Among the risk owners within every individual department or risk area. - Between risk owners and CGU's top management.	The system achieved a high level of efficacy in terms of providing up-to-date risks communication and access to the assigned users. The system helped CGU's risk owners communicate and identify the common issues and the common treatment plan that crosses functions between their risks. The evaluation showed improvement in unifying the risks perspectives and the future risk assessments will fit more and more with the organization's overall risk profile.

www.manaraa.com

Collaboration	1. Enable collaborative risk assessment. 2. Enable collaborative risk mitigation. 3. Improve the sense of agency and ownership over the risks. 4. Promote risk-sharing culture (reduce anxiety over sharing risk information).	The system activated collaborative strategies regarding risks where a number of departments formed internal meetings to discuss risks and come together to plan for ERM activities and risk mitigation. The access given by the system encouraged CGU individuals to start conversations about risks with each other that they never had before. This system empowers the sense of responsibility for risks and encouraged the mitigating actions. The shared ownership over risks encourages the employee's accountability to contributes in the process.
ERM process -	1. Provide ongoing access to risk information. 2. Enhance the efficiency of ERM activities concerning the time-consuming issues and slow progress. 3. Enable and automate the risk monitoring activities. 4. Encourage voluntary risk assessments. 5. Promotes risk sharing culture. 6. Solve the issues with risk content and perspective.	The KMS provides a convenient way to track the risk historical data to explore multiple angles of every problem. The access to risk information enabled the monitoring activities as it kept the risk owners more alarmed to monitor changes. The new system allowed CGU to conduct a comprehensive risk assessment round in a short time. They were capable of saving time and reducing the resources needed to perform the process. The information access allowed individuals to have a holistic view of the risks at the top level of all the different risks surrounding their work environment. Thus, many problems surrounding the RM culture started to dissolve.

Table 4. 12 Summary of TCCS Reflections

Client issues	Intervention Goals	Evaluation of goals achievement
Communication	1. Enable semitransparency and provide ongoing access to in-relation risk information. 2. Improve communications at three levels: - Communication within the committee. - Communication with the top management about the risk priorities, and mitigation plans and actions. - Communication between the ERM committee and the employee's inrelation to risks within every department.	There is an overall satisfaction in regard to how the tool is helping TCCS acquire clean and simple historical tracking of the data. The tool assesses TCCS in obtaining a centralized area where everyone can find the risk knowledge whenever they wanted. This encouraged the members to access risk information more often. The major improvement that was captured is the communication among the committee members. The other communication channels were not activated formally. However, the estimates indicate that the tool will facilitate this type of communication significantly.

www.manaraa.com

Collaboration	1. Increase the sense of agency over risks among the committee members. 2. Increase the involvement of risk owners outside the committee members. 3. Increase collaboration efforts inregard to risk evaluation and mitigation outside the physical committee meeting.	The committee members agreed that the use of the system reduced the level of pressure on the meeting time and provided assistance to shift the ERM focus to the risk treatment and planning spectrum. The members and the administration both gave more attention and effort to the process. The use of the tool helped identify the different connections between departments, and even re-identify their role in terms of risks. The tool allows everyone to be exposed to what others know and who knows what, and as such the people become more committed to what they know. The ultimate goal of this process is to mitigate risks, and collective efforts are the key to that.
ERM process	1. Establish automated monitoring activities. 2. Improve the routine risk assessment activities outside the committee meetings. 3. Advance the ERM administrative process as follows: - Improve the organizing and tracking of all the risk knowledge. - Maintain the consistency process regarding technology use and risk register formatting. - Reduce the complexity and time spent to perform all aspects of the ERM process.	From an administrative and organizing perspective, the information is kept classified. The system helped TCCS identify and evaluate part of the process systematically, which helped TCCS to sustain the ERM program while lowering the recourses, efforts, and cost. The committee members indicated that the use of the KMS helped them as a committee to cover more risk areas at every meeting than what they did previously.

4.2.5.2. Project learning outcomes:

(1) Knowledge Management System Implications:

According to Alavi and Leidner's (2001) framework, a well-designed KM system can serve organizations' efforts to deal with critical operational issues and dynamic environmental needs. They argue that IT plays a major role in elevating the management of organizational knowledge. KMS must be designed to improve knowledge creation, storage/retrieval, transfer, and application processes. They examined the effect of KMS from several perspectives. Table

www.manaraa.com

4.13 summarizes the evaluation of the research intervention from Alavi and Leidner's (2001) perspective of the value and the role of knowledge. Table 4.13 reviews the reflections from the observation and interview-based evaluation.

Table 4.13 Evaluation of KMS Implications on ERM (Alavi&Leidner,2001)

Views	Explanation	Implications of the system for the ERM process at CGU	Implications of the system for the ERM process at TCCS
Knowledge as a state of mind	Knowledge is the state of knowing and understanding.	The evaluation showed that KMS grew the individuals' knowledge about risks and helped them use the knowledge to participate more in the ERM process and mitigating the risks.	The KMS allowed the committee members to understand the value of their machine outside the meetings and facilitate their participation in more activities.
Knowledge as an object	Knowledge is objected to being stored and manipulated.	The KMS helped CGU implement the semi-transparency approach and create categorized risk registers to store the risk information coming from every individual risk area.	The evaluation showed that the main value of the KMS is how it facilitated and eased the risks information storing and categorizing.
Knowledge as process	Knowledge is a process of applying expertise.	The participants agreed that the system linked them to a different source of risk information and helped them participate, share, and utilize the information to establish collaborative practices.	The evaluation showed that the system linked the ERM process that is happening within the meetings to KM activities outside them. The system enhanced the knowledge flow and boosted collaborative risk assessments and risk planning.
Knowledge as a condition of having access to information	Organizational knowledge must be organized.	The system not only facilitates the access to risk information but also allows CGU to categorize and filtrate access authorization. The system facilitates the in-relation individuals' access and retrieval of content.	One of the main motives to use the tool for TCCS is to facilitate the access to risk information and searchability. The system left huge overhead to organize and access the risks' historical information.
Knowledge as capability	Knowledge is the potential to influence action.	The observation of the KMS implications on the organizational actions showed that access to knowledge activated and influenced a number of collaborative activities. For example, at least three committee meetings were formed to perform and organize ERM activities and plan for mitigating risks that did not exist before the tool.	The evaluation showed that it is too early to judge the contribution of the tool to this role of knowledge. There are some expectations and assumptions, however, this role was not captured during the study period.

www.manaraa.com

(2) Practical Implications for CGU:

The evaluation showed that the KMS that was implemented in the study impacted all three elements of the ERM process. The KMS can improve risk assessments, risk monitoring, and communication and consultation about risks.

Improving the ERM process:

The KMS transformed CGU's ERM process and changed it from a very centralized process to a collaborative and decentralized process. However, CGU's transformation was not simple or direct. There are many considerations and customized practices that CGU needed to benefit from the KMS. There are two major aspects of the ERM process that were performed through the system, risk assessment, and risk monitoring.

The ERM team, through face-to-face interaction, performed the previous risk assessments confidentially. The research evaluation showed that the confidential approach to ERM is what was damaging the risk assessment progress and outcomes. The tool introduced a different type of risk assessment practice that makes the risks owners the significant players in the process and introduced transparency. The risk information is now available to all individuals. The system is web-enabled, and the information can be accessed from any location at all times. The following points discuss how the KMS can maintain optimum performance for the risk assessments at CGU:

- The evaluation showed that KM practices through face-to-face communication are essential for using risk assessments, especially in the initial assessment phase. The web-based KM system could be employed to perform risk assessment activities after establishing a shared culture, building trust in the ERM process, and gaining a general understanding of risk management. Before enabling the technology-based risk assessments through the KMS, CGU

www.manaraa.com

risk owners need to understand the expectations from the process, classify their roles, and identify and own a number of risks. Individuals need a database or some kind of organizational memory associated with their role to help them identify risks.

- The major risk owners who were involved in the new risk assessments process recognized that the web-based KMS assists the overall quality of risk information. The system allows time for risk owners to thoughtfully think about risks and mitigate plans before sharing their reflections. The risk-sharing enabled the risks owners to see other risks in related departments, which helped them to see other parts of their work that they did not pay attention to in the past. The sharing led to more brainstorming and opened the possibility for new considerations.
- The access to risk information reduced the level of fear and intimidation from sharing. The risk owners stated that they usually felt like the risk assessments process is about finding something wrong with their work. The access provided by this system helped CGU personnel to understand the goal of the ERM process and reduced the resistance to share and participate.
- The access to risk information minimized the issues with RM culture help the organization to strengthen the risk assessment appetite. The risk owners stated that previously, they did not see results or any quantifying or qualifying information about even their own risks.
- The access to the risks registry enhanced the sense of ownership over the risks where the risk owners felt more accountable about the risks and encouraged their participation in the process.

Risk monitoring practices were absent in CGU before the implementation of the system. The risk monitoring process required time and resources that were not available for the ERM team.

www.manaraa.com

The system helped CGU to activate the risk monitoring practices by dividing the risk monitoring tasks and endorsed some decentralization that reduced process overheads and the RM team. The system allowed both risk owners and ERM teams to keep track of the tasks related to risk monitoring and allowed them to navigate through what is missing and what was changing. The evaluation showed that risk knowledge sharing, transferring and storing eased the risk monitoring for the risk owners and the RM team. The system can make the monitoring more organized and allow the risk information to be stored with the historical changes that every risk has gone through.

However, CGU top management emphasized the importance of supervising the technology-based risk monitoring activities, as CGU's risk management culture is still not mature enough. The top management and ERM team need to be cautious about giving the users the full freedom to edit and change the value of the already identified risks and become involved in validation of the risk information to maintain consistent outcomes.

Improving communication and consultation:

The system facilitated access to knowledge, mitigating plans and best practices of multiple individuals and departments. It enhanced communication channels within CGU to self-evaluate their own risk statuses and the success of their mitigating plans. The system can facilitate top management involvement to provide a consultation suggestion about how to mitigate risks. The system showed a clear impact on enhancing the RM culture by empowering risk communication, which led to more participation in risk treatments and solutions.

The system activated significant collaborative efforts among risk owners. The access to other people's risk information encourages the employee to claim shared ownership over risks and asks more questions about risks. The new lines of communication and the transparency

www.manaraa.com

approach were the reasons behind the forming of a couple of risk committees to collaboratively assign risk ownership, agree on risk information and plan for mitigation. In addition, the system allowed CGU's top management to become more aware of the status of the departments in regard to risks, which increased the level of collaboration with ERM representatives to address ERM issues.

The system inspired CGU to use its own resources to fix itself and overcome problems with the minimum efforts possible. The collaboration features enabled the ERM team to perform risk-monitoring activities for the first time and to conduct risk assessment rounds in less time.

Many participants at CGU indicated that similar risks in higher education occur in totally different departments. The evaluation showed that the system motivates people to be part of the solution. KMS helps in empowering the lines of communication and sharing of best practices from local levels so the organization can benefit from each other.

(3) Practical Implications for TCCS:

Improving the ERM process:

The motive that led CGU to consider the employment of information technology as part of the ERM process is to facilitate the complexity of organizing the risk information coming out of the committee. Another motive was to reduce the overhead of the administrative members. The evaluation showed that TCCS' experience with the system introduced other modifications and enhancements to the ERM process. The following points discuss how the KMS can reform ERM at CGU.

- The system provided a platform that assured a consistent process, reduced data integrity issues and allowed easy historical tracking of risks. The ERM team used to manually take

www.manaraa.com

the raw data out of the meetings' open discussions and transformed it into Excel sheets. The system facilitated this process by allowing systematic identification and evaluation of risks.

- The system enabled the member to come to the meeting with more knowledge about the risks and the tasks that were missing or accomplished. That helped the committee cover more tasks than before and collaboratively provided more efficient risk assessments. The ownership provided by this tool also increased the sense of urgency regarding risks that led to in-depth outcomes.
- The tool worked as a facilitator of the RM activities and increased the sense of ownership over the process, which made the discussion become in-depth and include deeper evaluating and planning for risks.
- The system can help reduce the damage to TCCS's ERM process expected as the result of the three resigned members. The KMS will help new members to configure the structure of ERM activities at TCCS, understand the current statuses and efficiently participate in the process quickly by providing access to well-organized risks and best practices in their area.
- The systems can help TCCS reduce the needed resources while sustaining the ERM program. The system gave TCCS alternative methods to collect risk data without going through meetings. TCCS needed to allocate assignments and tasks to the members in between meetings so that they can stay active in the risk assessment process at all times. That can help TCCS invest more time during the meetings to discuss mitigations and strategic plans, instead of focusing on identifying and collecting risk information only.
- The system helped TCCS to identify the various definitions of the same risks and their different evaluation approaches. The access to the knowledge helped to integrate the

www.manaraa.com

different opinions about the risks and eased the agreement on ERM risk outcomes within the meetings.

- The system allowed TCCS to monitor the missing risk activities. The use of the system can work in parallel to the committee meetings, where the members input the monitoring outcome through the system and use the meetings to confirm and review.

Improving communication and consultation:

One of the main effects of the use of the system is the enhanced communication about risks that led the members of the committee and the administration to have a deeper understanding of the issues and the plans from historical and comprehensive views. The tool eased the flow of the meeting discussion and moved it from focusing only on gathering information about the risks of evaluating the mitigating plans and confirming risks statuses. The system has enabled TCCS to identify patterns throughout the whole university.

TCCS from the beginning believed in transparency. However, they could not implement it technically. The access to risk information was complicated and the members were not motived to do it. The system facilitated transparency. The tool provided easy access to the risk information, which led to the practical use and utilization of this information to the benefit of the organization and departments. The evaluation showed that TCCS became more aware of the monitoring requirements and is able to achieve more efficient prioritization of risks and mitigation plans.

In terms of collaborative efforts, the system exposed TCCS to what others know. This activated collaborative efforts outside the meetings. The collaborative risk sharing before and after the meetings that this system eased reduced the pressure on the meeting time and allowed TCCS to infuse more risk monitoring and treatment discussions. The system also allowed

www.manaraa.com

TCCS to formally assign risks to the departments so that they could become more accountable and conscious of these risks beyond the meetings. If something new came up in the system, it allowed immediate and real-time reporting compared to waiting for the committee meeting to report that information. The system allowed the more efficient use of the resources through bettering communication, as members contributed more to identification and mitigation of the risks. The tangible effect of that on the ERM process will require more time to be seen. However, the system definitely stimulated the RM culture within the TCCS departments.

The system provided a remedy for the communication issues within the ERM committee and between the committee and both top and bottom levels of the TCCS structure. The whole organization can be aware now of TCCS issues and realistically benefit from the transparency approach.

www.manaraa.com

CHAPTER FIVE: CONCLUSION

5.1. Challenges and Recommendations

The project was guided by the action research methodology. Although the research followed the structure and the steps of the CAR method, there is a lot still to be done by TCCS and CGU to achieve optimum results from the KMS intervention and maximize the value of the system. TCCS and CGU still need to conduct on-going training, reconsidering the channels of communication and continuously assessing the ideal fit between the KMS and the ERM practices.

The researcher is an international student in the United States and expects to return to Saudi Arabia after graduation. The researcher was hired to manage and conduct the ERM process at CGU in 2017, and she is still working for CGU. The researcher worked with TCCS's risk management team as a consultant and observer, and her involvement with the ERM process came to an end upon completion of the research.

The researcher is expected to keep working with CGU for another six months. Before leaving CGU, she will keep improving the process, covering the remaining departments and areas that still need attention, train all the involved risk owners on the KMS, and deliver a consistent process that is easily maintained. Before she leaves, a key goal for the researcher is to train another staff member to supervise and maintain the ERM process through the KMS. However, there are some long-term challenges and recommendations that both TCCS and CGU need to consider.

5.1.1. Challenges and Recommendations for CGU:

- One of the challenges that faced the full implementation of the research is the resistance to conduct risk assessments through the KMS. The risk owners tend to stale with the risk

www.manaraa.com

assessment outcomes that the ERM team already assigned to them. The researcher recommends that the university either mandate the risk assessment round through the system or conduct a face-to-face risk assessment round annually to capture the new emerging risks.

- The risk owners were highly satisfied with the KMS. However, there is general confusion about how often they need to use the KMS and the desirable extent of their participation in the process. The ERM team, collaboratively with CGU's top management, must develop a written protocol that guides the risk owners for effective system usage. The purpose of this document is to increase confidence in using the system. The protocol needs to be part of their job description.
- From an ERM precision perspective, the evaluation showed that CGU is still not ready to pass complete control over the ERM process to the individual departments. Although the KM practices through the system mostly benefited the productivity of the ERM process, there is a need for top management to validate the significant risk changes and risk identification. The researcher recommends assigning shared ownership to every risk between the actual risk owners and the management's representatives.
- Although CGU's ERM process was compatible with a semi-transparent approach to risk access, there is a need for continuous evaluation of the ideal transparency levels. The perceived value from access to risk knowledge is highly dependent on the nature of the department or the risk owner roles. CGU should keep testing and reconsider the transparency need that is ideal for every individual position.
- Another challenge that ERM at CGU is facing regarding the use of KMS is the balance between face-to-face communication and technology-based communication. CGU needs

المنارة للاستشارات
www.manaraa.com

to continually use KMS practices like knowledge access and knowledge transfer in parallel with any communication approach.

- CGU must focus on enhancing the RM culture and remind the people continuously about the value of risk assessments as CGU is still at a low RM culture maturity. CGU needs to invest more in educating people about ERM values, goals, and objectives. CGU needs to employ persuasion techniques and notification tools to remind and encourage the individuals to access the risk register more often and to participate in risk-sharing activities.
- CGU must continuously evaluate the ERM progress and the effect of the system on the efficacy of the ERM practices. According to the ISO 31000 standard, the endless customization of the ERM practices and framework is essential for the success of the process. That applies to the execution of the KMS.

5.1.2. Challenges and Recommendations for TCCS:

- Although TCCS has a transparency approach to ERM, they are struggling to implement this approach practically. In the past, transparency was not effectively implemented, as there was no shared access or centralized database in place. Any access to the risk information needs to be requested from and processed by the ERM administrative team. The new system illuminated this obstacle. However, TCCS did not establish formal channels of communication outside the committee members. The system is used exclusively to serve the committee activities. The researcher recommends granting access to the individuals outside the committee who deal and interact with risks. TCCS needs to allow information flow beyond the committee members and empower the individuals within departments to contribute to the process.

www.manaraa.com

- Another challenge with the channels of communication is the top management involvement and continuous access to the process. The communication with the top management is performed on an *ad-hoc* basis. The KMS allows easy access to the risk information, which can be used to ensure continuous involvement of the top management. The top management involvement showed positive results in the CGU case and is expected to do the same at TCCS.
- TCCS' ERM team mainly uses the system as a shared and comprehensive risk register. They are struggling to use the system entirely as a KMS. The KM practices through the system are believed to support the ERM activities. This is a significant point of improvement for TCCS.
- The researcher believes that TCCS needs to work towards an attitude of decentralization and collaboration when dealing with risk assessments and risk monitoring. The evaluation showed a positive effect of this attitude on the ERM process quality. There are a number of committee members who are inactive beyond the meetings and think that ERM activities are the ERM team's duty. They believe that their inputs within the meeting are sufficient. The ERM team must assign more responsibilities over the risks to the committee members. The use of KMS will reduce the overhead on the ERM administrative efforts, empower the RM culture, and promote the risk owners to be more committed to their risks.
- TCCS is facing another challenge because of the resignation of three members of the committee. The ERM team decided to put a hold on the ERM activities until they replace the missing members and restructure the committee. The researcher recommends activating the use of KMS during that process. The team needs to keep sending

www.manaraa.com

notifications and reminders to encourage the members to use the system. This will keep the process active and help the risk management culture. Additionally, the system access is expected to help the new members to be involved in the process rapidly.

5.2. Contributions of the Research

5.2.1. Contributions to CGU

The researcher believes she improved and changed the ERM process within Claremont Graduate University. The Board of Trustees and CGU top management are very supportive of the results. They are planning to keep integrating the KMS with the ERM process. This research has contributed to CGU in the following areas:

- The research established a structure for CGU to find a balance between the face-to-face and KMS communication. CGU is now using the resources needed to conduct face-to-face communication more efficiently.
- Before the research intervention, the ERM process consumed a lot of time and resources. The action research clearly reduced the time and resources required to perform the ERM activities. The researcher restructured the risk owner's list to include the directors, deans, and heads of the departments and used them as informers to reflect the risks under their area. The system was also employed to ensure that the whole university collaboratively performed the ERM tasks that used to be completed by the ERM team alone. The system reduced the time required to perform the risk assessments by offering a hybrid approach between face-to-face and technology-based communications. In addition, the KMS allowed CGU to complete the risk monitoring activities with minimum resources, which allowed CGU to perform regular risk monitoring for the first time.

www.manaraa.com

- The research transformed the ERM process from a fully confidential to a semi-transparent process supported with a KM tool that permits continuous access to in-relation risk knowledge. For the first time, CGU now possesses a line of communication regarding risks. The university as a whole is now aware of the university risk status and can communicate continuously about risks and risk treatments.
- The shared risk register created an organizational memory for CGU. As this organizational memory is shared within the related departments, the employees can use this information in tasks and activities related to risks and employ this information in other operational aspects.
- The system allowed employees to be aware of the current risks and risk treatments around them. The KMS promoted risk accountability within departments and generated more action regarding risks in a short time. The KMS improved the risk management culture all over the university and made risk tasks everyone's responsibility.
- The system stimulated collaborative efforts because of the access to the departments' risk register and the ownership that was given to employees. Some departments determined to form an internal committee or organize regular meetings to discuss subjects and issues related to the tool and ERM tasks. The meetings aimed to collaboratively agree on the risk ownership, risk evaluation, and the best mitigation plan. These types of discussions did not formally or informally exist before the system.

5.2.2. Contributions to TCCS:

The ERM team at TCCS is very supportive of the improvements caused by the use of KMS. They are planning to keep integrating the system with the ERM process and activities. The research contributed to TCCS's ERM process in the following ways:

www.manaraa.com

- The suggestions and plans resulting from the problem diagnosis stage changed the way TCCS was planning to implement the tool. TCCS was planning to use technology to provide a shared risk register and facilitate data entry and historical tracking of risks. The research helped TCCS to integrate KM practices as part of the tool adoption and intervention.
- The KMS intervention eased and facilitated the complicated, as well as time-consuming administrative and data entry tasks performed by the ERM team.
- The system helped TCCS to build communication channels about risks. Currently, TCCS has improved communication within the ERM committee. They are interested in involving the top management and different departments and areas in the ERM process. The research helped TCCS to emphasize the importance of enabling the communication channels in parallel to risk assessments and monitoring.
- The system helped TCCS to acquire a transparent ERM process. Although TCCS believed in transparency and were open about sharing risk information with everyone, realistically they did not have any systematic process of risk sharing and obtaining risk knowledge. The KMS enabled TCCS's transparency approach to produce a number of the anticipated benefits like establishing collaborative efforts and improving the risk culture.

5.2.3. Contributions to Theory

- This research contributes to knowledge in the field of KM by offering variables and practices that help further researchers to understand the integration between KM and ERM. The action research answered some of the missing questions within the theoretical background of how people, organizations, and technology should interact to support and

www.manaraa.com

improve the risk management through the optimum use of risk knowledge. The research contributes to RM theory by categorizing the KM variables and patterns that are related to ERM. The research helped to identify KMS strategies to balance between centralized and decentralized approaches in a practical setting (Maier & Hadrich, 2008) The concept of knowledge has been introduced as a solution to concerns of risk management (Marshall et al., 1996; Dickinson, 2001). This research examined the claims and measured the level of effectiveness that utilizing KM systems might introduce to ERM.

- The research based on Alavi and Leidner (2001) indicates that the ideas about the organizational structure were to see organizations as social collectives and knowledge systems. The research helped to identify the strategies and perspectives to integrate the KM system into specific managerial operations like the ERM process. The research examined the dynamics and improvement of the ERM process when knowledge is seen as a process, an object, a state of mind, a capability, and an access to information.
- The research studied the potential relationships between KM and RM concepts that have been studied independently. The literature review showed a weak view of KM supporting the ERM process, which was the primary motive to conduct action research that investigates the gap. The research showcased risk management as a solution to the lack of knowledge that explains the meaning, reasoning and effect of risks (Marshall et al., 1996).
- The research tried to link the concepts of the possible relationships already discovered and confirm them within a practical setting. The action research looked at the KMS technology, and confirmed that people are important factors to understand the typical KMS implementation to serve and promote the ERM process (Edwards et al., 2005).

www.manaraa.com

Some variables were discussed in general contexts like enhancing individual and group communication coordination and collaboration (Alavi & Leidner, 2001).

- The research emphasized the importance of human interaction and human action in parallel with the use of KMS. The analysis provides empirical results that defined the effect of KMS on enhancing human communication and collaboration beyond the system. The study builds on the efforts that support the value of technology for mitigating and managing risks. The alignment of technology with the known quality and management support was found as an essential component to maintaining successful KMS. The research presented the patterns that teams and individuals tend to follow, and the development of working skills in RM practice as a response to the KMS intervention. The results showed that successful KMS implementation must be built around the human factor.
- This study offers guidance concerning the areas of a KMS that are likely to contribute to the existing ERM process. In general, the technology showed a positive effect on the work environment and performance about risks. This finding builds on the research efforts that connect KM practices and KMS to the increased levels of ownership over risks, which have been shown to have a significant impact on ERM outcomes and successes (Paape & Spekle, 2012). The current investigation showed that KM concepts like sharing best practices, case-based reasoning, benchmarking, knowledge owner mapping and cross-function issues emerged as factors that can increase the organization's technology readability.

www.manaraa.com

5.2.4. Foundation for Enterprise Risk Knowledge Management System

The research contributes to the efforts that attempt to understand the dynamics between the KM and ERM processes. The research identified patterns and best practices of the KM process that are associated with risk assessments, risk monitoring and risk communication and consultations. The KM processes showed different influences and interactions with the various components of the ERM process. Knowledge transfer was one of the critical KM processes in terms of empowering risk assessment and monitoring. Knowledge transfer provides a holistic view of risks across the organization that extends the efforts to enhance the understanding of the ERM implementation (Spies et al., 2005).

As discussed before, risk assessment is a continuous process that involves three main phases: risk identification, analysis, and evaluation (Maguire, 2002). These three themes describe the relationship between the KM process and risk assessment activities. The results of this study tie the risk assessment in general to a hybrid approach between human-based KM and the KMS. The balance between the two approaches depends on whether it is a voluntary, requested, initial or followed-up risk assessment.

The results show that the ERM process in the early stages of implementation required more concentration on human-based risk identification, analysis, and evaluation techniques. Human interaction is expected to help the organization become more aware of the ERM goals, build trust in the ERM process, and define the baseline for the risk assessment process. As individuals within the organization become more aware of risk assessment practices and acquire risks that they know they own, the technology-based KM can play a more prominent role. The results show that the top-management supervision of the risk assessment conducted through the

www.manaraa.com

KMS will decrease with the continuous use of the system. This is due to the increased level of awareness.

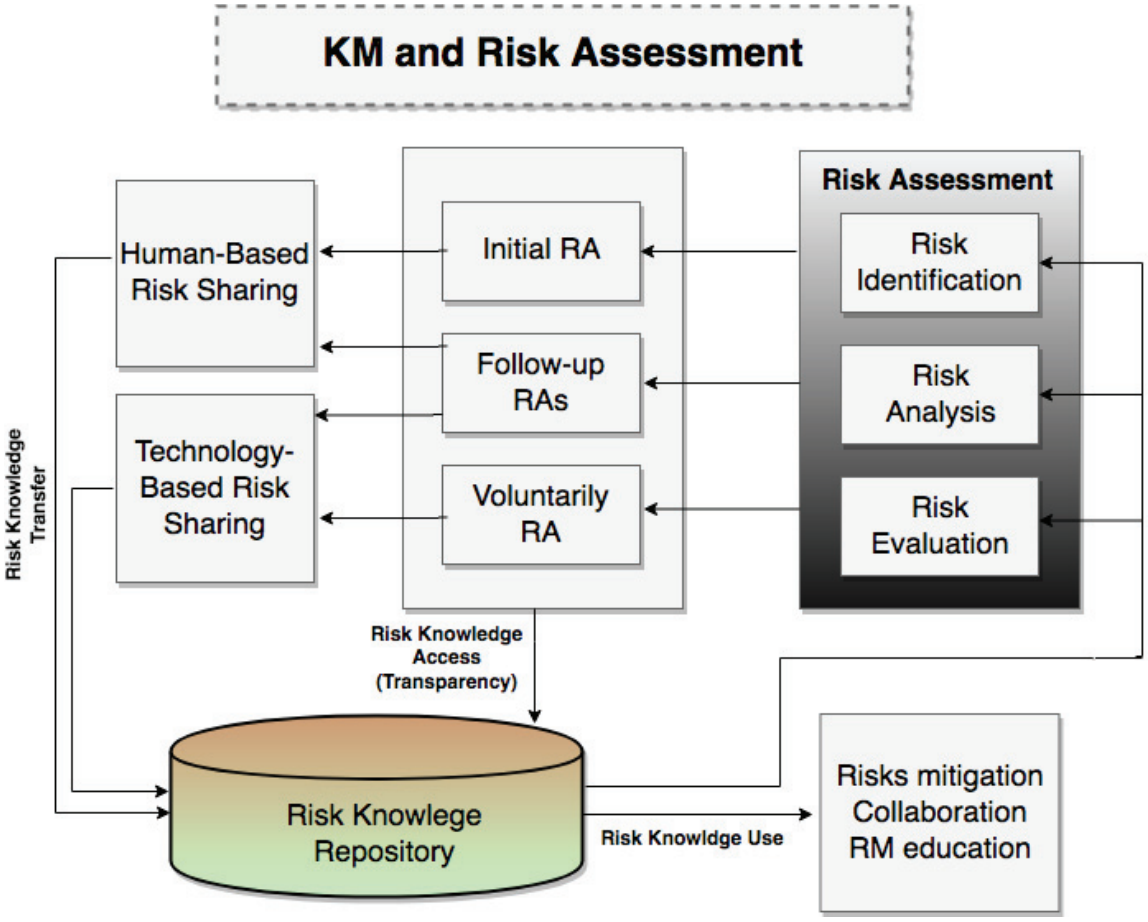


Figure 5. 1 KM Processes and Risk Assessment

The KMS is essential to the reduction of costs and resources needed to conduct the RA activities. Thus, technology-based access to the risks register is essential for all identified themes and considered as the primary factor that improves the quality of risk assessments and transfers the risk assessment from a local level to an enterprise level. The results confirm that continuous access to risks significantly enhances the RM culture and enables collaborative risks assessments. Figure 5.1 illiterates this relationship.

www.manaraa.com

The second ERM element examined in this research is risk monitoring. The results show that there is a strong association between access to the organization risk register and the quality and existence of risk monitoring activities. They revealed that organizations are facing difficulties in performing risk monitoring through human-based communication, because risk monitoring practices demand a lot of time and resources. Risk monitoring activities were correlated to all KM processes. Moreover, in both organizations, the risk monitoring activities did not formally exist before enabling decentralized risk monitoring through the use of the KMS.

The results demonstrate that KMS helped the organization to collaboratively evaluate the areas that need risk monitoring and used the already existing organizational resources. The exposure to organization's risk information equips the different risk owners, top management and other individuals with the skills to identify, analyze and control emerging risks while evaluating the already identified risks. Transparency allowed them to recognize their local needs concerning risks. KMS is seen as an essential practice that empowers the organizational ability to monitor risks at both department and enterprise levels. Figure 5.2 illustrates the relationship between KM and risk monitoring.

Lastly, the results defined a secure connection between technology-based KM practices and communication and consultation capabilities. Access to risk knowledge and enabling transparency opened different levels of communication channels both top-down and bottom-up. As suggested by Gjerdrum and Peter (2011), the KMS facilitated the identification of the appropriate internal and external risk stakeholders throughout the organization. The transparency, through KMS, increased the accountability of the risk stakeholders and permitted shared ownership for cross-functional risks.

www.manaraa.com

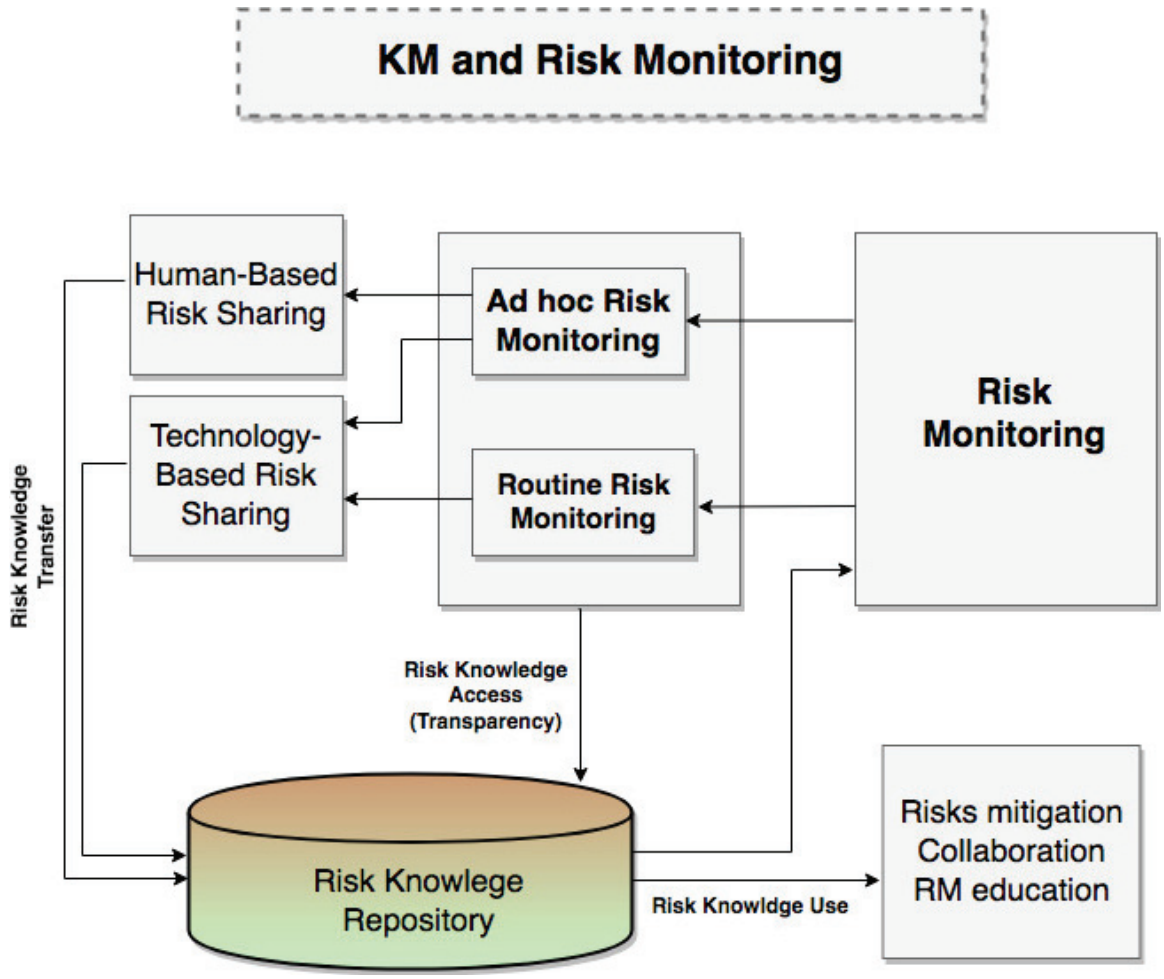


Figure 5.2 KM Processes and Risk Monitoring

The research identifies a direct connection between up-to-date access to the risks registry and organizational ability to communicate about risks. These communication channels are opening consultation networks and enabling the organization to maximize the value of the existing resources to mitigate risks. The results showed that KMS open communication and consultation channels ease top management involvement, and enhance internal and external collaboration.

The results showcased a strong foundation to design a KM risk framework that guides universities and organizations with a similar structure through the integration of KM practices

www.manaraa.com

into ERM implementation. However, additional active investigation is needed to further validate the research findings.

5.3. Lessons from the Action Research

As discussed in Chapter Three, there are different approaches to conduct action research. Action research is generally unpredictable in regards to completion and success. However, the completion of this research was due to the full support from the CEOs at both organizations. The researcher acquired full collaboration from TCCS's ERM team who provided access to all ERM activities and members. The researcher acted in a dual role of being both an organizational consultant and a researcher. At CGU, the researcher is the principal member of the ERM process. She is the ERM assistant to the VP of Finance and Administration. The researcher builds a secure connection with the leading individuals in ERM at both organizations. These facts led to the following:

- The direct access to CGU's top management provided the researcher with more power to finish tasks, solve problems and get the participants' attention. In the CGU case, the resistance to participate in any of the research phases was solved by the VP of Finance and Administration's intervention. In TCCS, the appointment scheduling and the communication between the researcher and the ERM committee members were conducted through the Risks Manager and VP of Finance.
- The life cycle of action research was easier and shorter because of the researcher's direct involvement in the organization. Action research is more stable and produces better results if the researcher is directly involved with the organization. The researcher's involvement at CGU supported the research in acquiring more flexibility and ability to customize the intervention and get better results.

www.manaraa.com

However, the same facts and the research role at both organizations led to several challenges:

- The coordination between the researcher's role and tasks at both organizations was very challenging.
- The researcher found difficulties in trying to balance between the progress of the different research phases and the tasks associated with her position as an ERM assistant at CGU. The researcher struggled to finish the research process on time. The accomplishment of many of the ERM tasks as part of her job was required in order to move forward with the research stages.
- The researcher's roles exposed her to various sources of information like meetings, documentation, endless discussions, interviews, risk assessments, and training sessions. The analysis of all this information was time-consuming and caused information overload.

5.4. Lessons learned from conducting action research at two organizations:

- Studying two different organizations allowed the researcher to examine the effect of the same KMS on unique ERM processes in terms of maturity level, size, and type of ERM practices. The researcher now has a better understanding of the dynamics between the research variables and how to integrate the KMS with the already existing ERM process.
- The researcher was exposed to different conditions and situations that impact the ERM process; the research results examined how the KMS deals with them and becomes part of the solution.

- Action research is very dependent on the level of control to intervene on what the organization authorizes. The researcher experienced two different levels of authorization in

www.manaraa.com

this research. At CGU, the researcher was able to establish full control in order to change and conduct the intervention, which allowed her to experiment with and customize the system according to the progress and the results. However, the researcher's involvement in TCCS's intervention was limited, and the ERM team approvals and actions controlled her ability to enforce changes. In general, this is the typical researcher involvement in the majority of action researches.

- The researcher was able to examine different scenarios of implementing KMS including transparency levels and balance between face-to-face and technology-based communication.
- The similarity between the two organizations, in terms of KMS involvement, will open the way to provide a generalization on the relationship between ERM and KM and facilitate the efforts to design a framework that explains this relationship.
- Action research is not a stable type of research as it is dependent on real-life organizations and situations. For example, the TCCS committee was put on hold before the scheduled end of the research and before the full implementation of the research plan. The existence of the other research at CGU helped the researcher extend the understanding of the phenomenon and keep the investigation alive.

Table 5. 1 Summarizes the action research at both CGU and TCCS.

Table 5. 1 Summary of the action research at CGU and TCCS

	CGU	TCCS
Type of ERM process	Interview based Confidential Centralized	Committee-based Semi-transparence Centralized
Researcher role	Full access to CGU Full responsibility to assess, modify and perform the current ERM tasks and the Risk Wizard implementation.	Limited access to TCCS Limited control over the process of transitioning to the new KM tool.
Main Issues	- Lack of communicating about risks and risk mitigating plans. - Lack of collaborative risks assessment and risk-mitigating.	- Lack of communication within the committee members about risks beyond the meetings. - Lack of communication outside the

www.manaraa.com

	- Lack of sense of agency and ownership over the risks. - The ERM process is very confidential and centralized. - The absence of risk monitoring activities. - ERM is very time consuming and resources consuming.	committee. - Lack of collaboration efforts outside the physical committee meeting. - Lack of the routine risk assessments. - The absence of risk monitoring activities. - The ERM process is centralized.
Proposed actions	- Adapting a semitransparent approach to ERM where risk owners authorized to access all in-relation risk areas. - Adopting a hybrid approach to perform ERM activities between face-to-face interviews and KM practices. - Assigning specific risks to specific employees and giving them the full responsibility for maintaining the risk statuses. - Implement KM practices to encourage them to participate in the risk-sharing activities. - Decentralizing the ERM process. - Automating major parts of ERM activities. - Giving shared ownership and access to the risks that fall under multiple departments.	- Automating major parts of ERM activities. - Encouraging the use of KMS in between meetings to perform risk assessments and monitoring. - Assigning shared risk ownership to risk owners inside and outside the committee. - Adopting a hybrid approach to perform the ERM activities between committee meetings and the KMS. - Automate the routine risk assessment activities through the KM system. - Enabling fully automated risk monitoring activities through the KM system.
Intervention Goals	- Enable semi-transparency and provide ongoing access to in-relation risk information. - Improve communicating about risks and risk mitigating plans. - Enable automated and collaborative risk assessment. - Enable and automate risk-monitoring activities. - - Improve the sense of agency and ownership over the risks. - Promote a risk-sharing culture	- Enable transparency and provide ongoing access to in-relation risk information. - Improve communications inside and outside the committee. - Increase the sense of agency over risks among committee members. - Increase the involvement of risk owners outside the committee members. - Establishing automated monitoring activities. - Advance the ERM administrative process.
Evaluation of Goals Achievement	- The system achieved a high level of efficacy in terms of providing up-to-date risks communication and access to the assigned users. - The system helped CGU's risk owners communicate and identify the common issues, and the common treatment plan that crosses functions between their risks. - The system activated collaborative strategies regarding risks - The access given by the system encouraged CGU individuals to start conversations about risks. - This system empowers the sense of	- There is an overall satisfaction in regard to helping TCCS acquire clean and simple historical tracking of the risks. - The tool assesses TCCS in obtaining a centralized risk register. - Improved the communication among the committee members. - The other communication channels were not activated formally. - The intervention reduced the level of pressure on the meeting time. - The use of the tool helped identify the different connections between

www.manaraa.com

	responsibility over risks and encouraged the mitigating actions. - The KMS provides a convenient way to track the risk historical data to explore multiple angles of every problem. - The access to risk information enabled the monitoring activities as it kept the risk owners more alarmed to monitor changes. - The new system allowed CGU to conduct a comprehensive risk assessment round in a short time.	departments - The tool allows everyone to be exposed to what others know and who knows what. - The system helped TCCS to sustain the ERM program while lowering the recourses, efforts, and cost.

5.5. The research limitation:

The acknowledgment of the research limitation is significant. This action research faced several limitations. One of the main limitations of conduction action research like this was that is was not achievable to generalize the results to all higher education organizations. There is a need to further examine the results of this research to understand how the results gained from the organizations within this research can represent the reality of the broader population. There is a need to conduct quantitative research that aims to support the generalization of the current action research.

Another limitation is the fact that the results of this research were limited by the results that action research can provide. Action research is a research that occurs on a number of unique case studies with unique structure and situation. In the case of this action research, the researcher faced many challenges and issues that limited the extent of implementation of the KMS. Example of that is the ERM meetings hold that TCCS was forced to do in responding to the resigning of three main members of the ERM committee.

In addition, time was another limitation that affected the results of this research. Monitoring the organizations for a more extended period might introduce additional findings and insights about how KMS changed the ERM practices in the two organizations. Time as well limited

www.manaraa.com

the researcher ability to conduct additional research cycle at both organizations and examine different KM practices.

5.6. Recommendations for Future Research

The results of this research generate a theoretical foundation for forming a risk knowledge management (RKM) framework for higher education. This framework could work as a guideline that instructs the implementation of KM practices in higher education organizations. Future research could focus on investigations that contribute to these efforts.

The results of this research have implications for practice and future research in understanding the relationship between KM variables and RM variables. The researcher believes that the results of this intervention-based research could be validated and investigated in other sectors such as healthcare, government services and manufacturing. Another area for further research would be a quantitative comparison of more organizations with distinctive ERM maturity levels. The contrast could include their experience with KM implementation and practices. The quantitative comparison will contribute to validating the relationships emerging throughout this research.

The research identifies the ideal patterns and practices towards the emerging technology-based KM practices within the ERM process. For example, the results showed different patterns of using technology-based risk sharing when conducting risk assessments. Future investigations can experiment with and validate the different patterns identified in this research with another type of organization and environment.

The results of this research have implications for practice and future research in the field of ERM. The study findings are significant for decision makers in higher education organizations that aim to implement risk management practices. The findings provide initial background to

www.manaraa.com

better understand the relationship and standard practices to embed KM in the risk management process in higher education. However, through the use of contingency theory to guide the research, the researcher suggests investigating other organizational and technological factors that might facilitate the success of the ERM process. Further studies should examine whether additional factors such as management structure, organization size, financial situation, and organization type and level of risk culture could impact the integration of KM into in the ERM process.

Other future research could build on the findings of this research by further investigating how KMS transforms the isolated approach to risk management into a collaborative approach. Research efforts can extend to examine how collaborative approaches to risk management are affecting ERM performance and risk owners' value creation. This study did not directly explore the role of KM intervention on the risk mitigation rate but illustrates the potential value. It is suggested that future investigation should be conducted in order to examine the impact of the various levels of KM deployment on the risk mitigation efforts and the perceived value of the ERM process.

5.7. Conclusion

This study extends the emerging research on ERM by investigating the practical implications of the use of KMS in an established ERM process. The study used action research to help identify issues with the process and practically examine the needed KM practices to overcome these issues.

Previous studies showed that higher education organizations are struggling to incorporate the ERM process into their daily operations. The researcher suggests that KM practices are needed to facilitate the ERM activities and encourage collaborative efforts

www.manaraa.com

between the university's different entities. The findings confirm that KM practices and integration of KMS are vital to overcoming the higher education organizations' struggle with implementing the ERM process. Managing risk knowledge across the organization is critical to enhance the ERM practices and use the organization resources to mitigate and manage risks.

Findings from the study uncover that there are some unique aspects to implementing ERM in the higher education environment. Higher education must avoid replicating the KM practices from business or industrial ERM environments. Every higher education organization is unique, and the integration of KM into the risk management process must align with the organizational objectives and needs. The power of KMS lies in its ability to expedite knowledge sharing, create organizational memory and maximize the use of the organizational resources. The KMS can support anyone involved or trying to be involved in the ERM process to learn about the current status, best practices and both successful and problematic areas. Findings from this study contribute to the growing body of knowledge about IS action research, KM, and the ERM process.

www.manaraa.com

References

Abrams, C., Von Kanel, J., Muller, S., Pfitzmann, B., and Ruschka-Taylor, S. (2007). Optimized enterprise risk management. *IBM Systems Journal 46*(2), 219-234.

Aven, T., & Flage, R. (2018). Risk Assessment with Broad Uncertainty and Knowledge Characterisation: An Illustrating Case Study. Knowledge in Risk Assessment and Management, 1-26.

AIRMIC, A., & Irm, A. (2010). structured approach to Enterprise Risk Management (ERM) and the requirements of ISO 31000. *The Public Risk Management Association, London, UK*.

Alavi, M., and Leidner, D. E. (2001). Knowledge management and knowledge management systems: conceptual foundations and research issues. *MIS Quarterly*, 107-136.

Alhawari, S., Karadsheh, L., Nehari Talet, A., and Mansour, E. (2012). Knowledge-based risk management framework for information technology project. *International Journal of Information Management 32*(1), 50–65. https://doi.org/10.1016/j.ijinfomgt.2011.07.002

Al-Zatma, N. (2011). *Knowledge management and its impact on performance excellence* (Unpublished master's thesis). Islamic University, Gaza Strip.

Association of Governing Boards of Universities and Colleges and United Educators (2014). A wake up call: Enterprise risk management at colleges and universities today.

Acharyya, M. (2008). An empirical study on enterprise risk management in insurance. In D.L. Olson, D. Wu (Eds.), *New frontiers in enterprise risk management* (39–55). Berlin, Heidelberg: Springer Berlin Heidelberg.

Baskerville, R., & Pries-Heje, J. (1999). Grounded action research: a method for understanding IT in practice. Accounting, Management and Information Technologies, 9(1), 1-23.

Baskerville, R., & Wood-Harper, A. T. (1998). Diversity in information systems action research

www.manaraa.com

methods. European *Journal of information systems, 7(2), 90-107.*

Baxter, R., Bedard, J. C., Hoitash, R., & Yezegel, A. (2013). Enterprise risk management program quality: Determinants, value relevance, and the financial crisis. *Contemporary Accounting Research*, *30*(4), 1264-1295.

Beasley, M.S., Branson, B.C., and Hancock, B.V. (2010). *Enterprise risk oversight: a global analysis*. Chartered Institute of Management Accountants.

Burke, W. W. (2017). *Organization change: Theory and practice*. Sage Publications.

Cameron, E., & Green, M. (2015). *Making sense of change management: A complete guide to the models, tools and techniques of organizational change*. Kogan Page Publishers.

Burnell, L. J., Priest, J. W., & Durrett, J. R. (2004). Developing and Maintaining Knowledge Management Systems for Dynamic, Complex Domains. In *Creating knowledge based organizations* (pp. 203-229). Igi Global.

Butterfield, B. (2017). Traditional Risk Management Vs Enterprise Risk Management: Which Approach Is The Best Choice For Your Company?. Lowndes-law.com. Retrieved 24 January 2018, from https://www.lowndes-law.com/news-center/2293-traditional-risk-management-vs-enterprise-risk-management-which-approach-the

Campo, R. A. (2009). *How do college and university leaders organize and implement policies of risk management to prevent or mitigate institutional liability?*. D'Youville College.

Chinowsky, P., & Carrillo, P. (2007). Knowledge management to learning organization connection. *Journal of Management in Engineering*, *23*(3), 122-130.

Committee of Sponsoring Organizations of Treadway Commission. (2004). *Enterprise risk management: integrated framework*.

www.manaraa.com

Choi, S. Y., Lee, H., and Yoo, Y. (2010). The impact of information technology and transactive memory systems on knowledge sharing, application, and team performance: a field study. *MIS Quarterly*, 855-870.

Creswell, J. W. (2007). *Qualitative inquiry and research design: choosing among five approaches*. Thousand Oaks, CA: Sage.

Dafikpaku, E., Eng, M. B. A. B., & Mcmi, M. (2011, March). The strategic implications of enterprise risk management: A framework. In *ERM Symposium* (Vol. 48).

Dali, A., and Lajtha, C. (2012). ISO 31000 risk management—"the gold standard." *EDPACS 45*(5), 1-8.

Dalkir, K. (2010). *Knowledge management in theory and practice*. Montreal: Elsevier.

Daud, W.N.W. (2011). The role of the quality internal adult support in enterprise risk management (ERM) practices: evidence from Malaysia. *International Journal of Business and Social Sciences 2*(5), 205-211.

Davison, R., Martinsons, M., and Ou, C. X. J. (2012). The roles of theory in canonical action research. *MIS Quarterly 36*(3), 763–786.

Davison, R., Martinsons, M. G., & Kock, N. (2004). Principles of canonical action research. Information systems journal, 14(1), 65-86.

Davenport, T. H., and Prusak, L. (1998). *Working knowledge: how organizations manage what they know*. Cambridge: Harvard Business Press.

Degagne, C., Leandri, C., & Puchley, T. (2004). Linking knowledge and risk management controlling the information flood. Business, January, PricewaterhowseCoopers.

Dhamdhere, S. (2015). Importance of knowledge management in the higher educational institutes. *Turkish Online Journal of Distance Education-TOJDE 16*(1.

www.manaraa.com

Di Mascio, T., & Tarantino, L. (2015, September). Designing for children: blending HCI and action research. In *Proceedings of the 11th Biannual Conference on Italian SIGCHI Chapter* (pp. 1-9). ACM.

Dickinson, G. (2001). Enterprise risk management: its origins and conceptual foundation. *The Geneva Papers on Risk and Insurance. Issues and Practice 26*(3), 360-366.

Dionne, G. (2013). Risk management: history, definition, and critique. *Risk* Management and Insurance Review 16(2), 147-166.

Donaldson, L. (2001). *The contingency theory of organizations*. Sage.

Committee of Sponsoring Organizations of Treadway Commission. (2004). *Enterprise risk management: integrated framework*.

Eberwein, P., Auw-Hädrich, C., Birnbaum, F., Maier, P. C., & Reinhard, T. (2008). Corneal melting after cross-linking and deep lamellar keratoplasty in a keratoconus patient. Klinische Monatsblatter fur Augenheilkunde, 225(1), 96-98.

Farrell, M., & Gallagher, R. (2015). The valuation implications of enterprise risk management maturity. *Journal of Risk and Insurance*, *82*(3), 625-657.

Fiss, P. C., Marx, A., & Cambré, B. (2013). Chapter 1 Configurational Theory and Methods in Organizational Research: Introduction. In *Configurational theory and methods in organizational research* (pp. 1-22). Emerald Group Publishing Limited.

Fraser, J. R., Schoening-Thiessen, K., and Simkins, B. J. (2008). Who reads what most often? A survey of enterprise risk management literature read by risk executives. *Journal of Applied Finance 18*(1), 73- 91.

Gamble, P. R., & Blackwell, J. (2001). *Knowledge management: A state of the art guide*. Kogan Page Publishers.

www.manaraa.com

Gates, S., Nicolas, J. L., & Walker, P. L. (2012). Enterprise risk management: A process for enhanced management and improved performance. *Management accounting quarterly*, *13*(3), 28-38.

Gatzert, N., & Martin, M. (2015). Determinants and value of enterprise risk management: empirical evidence from the literature. *Risk Management and Insurance Review*, *18*(1), 29-53.

Gjerdrum, D., & Peter, M. (2011). The new international standard on the practice of risk management–A comparison of ISO 31000: 2009 and the COSO ERM from Maguire work. Risk management, 31(2), 8-13.

Grace, M., Leverty, J., Phillips, R., and Shimpi, P. (2015). The value of investing in enterprise risk management. Journal of Risk and Insurance, 82(2), 289-316.

Gjerdrum, D., and Peter, M. (2011). The new international standard on the practice of risk management–a comparison of ISO 31000: 2009 and the COSO ERM framework. *Risk Management 31*(2), 8-13.

Helsloot, I., and Jong, W. (2006). Risk management in higher education and research in the Netherlands. *Journal of Contingencies and Crisis Management 14*(3), 142-159. doi:10.1111/j.1468-5973.2006.00490.x.

Herr, K., & Anderson, G. L. (2014). The action research dissertation: A guide for students and faculty. Sage publications.

Howell, D., Windahl, C., & Seidel, R. (2010). A project contingency framework based on uncertainty and its consequences. *International Journal of Project Management*, *28*(3), 256-264.

Jalal, A., AlBayati, F.S. andAlBuainain, N.R. (2011). Evaluating enterprise risk management

www.manaraa.com

(ERM): Bahrain financial sectors as a case study. *International Business Research 4*93), 83-92.

Jennex, M. E. (Ed.). (2008). *Knowledge management, organizational memory and transfer behavior: global approaches and advancements: global approaches and advancements*. Igi Global.

Jones, G. R., & Jones, G. R. (2010). Organizational theory, design, and change.

Jubran, A. and Mansouri, A. (2015). The degree of applying knowledge management processes at Sultan Qabu University in the Sultanate of Oman from the perspective of its faculty members. *Hebron University Journal of Research 10*(2), 1-27.

Kamya, Ntayi, J., and Ahiauzu, A. (2010). Knowledge management and competitive advantage: the interaction effect of market orientation. *African Journal of Business Management 4*(14), 2971-2980.

Karadsheh, L., Alhawari, S., El-Bathy, N., & Hadi, W. (2008). Incorporating knowledge management and risk management as a single process. In *Proceedings of International Conference of the Global Business Development Institute (GBDI) Las Vegas, NV, USA* (pp. 207-214).

Kemmis, S., McTaggart, R., & Nixon, R. (2014). The action research planner: Doing critical participatory research.

King, R., Marginson, S., & Naidoo, R. (Eds.). (2011). Handbook on globalization and higher education. Edward Elgar Publishing.

Kohoutek, J. (2013). Three decades of implementation research in higher education: limitations and prospects of theory development. *Higher Education Quarterly*, *67*(1), 56-79.

www.manaraa.com

Kunda, G. (1995). Engineering culture: Control and commitment in a high-tech corporation. *Organization Science*, *6*(2), 228-230.

Lam, J. (2006). *Enterprise risk management.* Presentation to the Federal Reserve.

Layton, M. (2007). Traditional risk management inadequate to deal with today's threats. *Irmi.com*. Retrieved from https://www.irmi.com/articles/expert-commentary/traditional-risk-management-inadequate-to-deal-with-todays-threats.

Lee, H. and Choi, B. (2003). Knowledge management enablers, processes and organizational knowledge: an integrative view and empirical investigation, *Journal of Management Information Systems*, *20*(1), 179-228.

Levine, R. (2004). Risk management systems: understanding the need. *Information System Management 21*(2), 31-37.

Lundquist, A. E. (2015). Enterprise Risk Management (ERM) at US colleges and universities: Administration processes regarding the adoption, implementation, and integration of ERM.

Maccani, G., Donnellan, B., & Helfert, M. (2014, May). Action design research in practice: the case of smart cities. In International Conference on Design Science Research in Information Systems (pp. 132-147). Springer, Cham.

Maguire, S. (2002). Identifying risks during information system development: managing the process. *Information Management and Computer Security 10*(3), 126-134.

Maher, H. and Husain, M. (2014). The impact of knowledge management processes on the quality of higher education in Iraq (an analytical study from a leadership perspective). Saudi International Conference of Entrepreneurship Associations and Centers, Iraq.

www.manaraa.com

Marshall, C., Prusak, L., and Shpilberg, D. (1996). Financial risk and the need for superior knowledge management. *California Management Review 38*(3), 77-101.

McDonnell, P., & McNiff, J. (2016). Action research for professional selling. Routledge.

McShane, M., Nair, A., and Rustambekov, E. (2011). Does enterprise risk management increase firm value? *Journal of Accounting, Auditing and Finance 26*(4), 641-658.

McDermott, R., and O'Dell, C. (2001). Overcoming cultural barriers to Ssaring knowledge. *Journal of Knowledge Management 5*(1), 76-85.

Meihami, B. and Meihami, H. (2013). Knowledge management: a way to gain a competitive advantage in firms (evidence of manufacturing companies). *International Letters of Social and Humanistic Sciences 14, 80-91.*

Mintzberg, H. (1979). An emerging strategy of" direct" research. Administrative science quarterly, 24(4), 582-589.

Mitroff, I. I., Diamond, M. A., & Alpaslan, M. C. (2006). How prepared are America's colleges and universities for major crises?. *Change: The Magazine of Higher Learning*, *38*(1), 61-67.

Myers, M. D. (1997). Qualitative research in information systems. *MIS Quarterly 21*(2), 241-242.

Nocco, B. W., & Stulz, R. M. (2006). Enterprise risk management: Theory and practice. *Journal of applied corporate finance*, *18*(4), 8-20.

Oblakovic, G. (2013). *Risk management at the strategic and operational levels of Swiss banks: current status and lessons learned from the subprime crisis* (Doctoral dissertation).

Olson, D. L., and Wu, D. D. (2015). *Enterprise risk management in finance*, Hackensack, NJ: World Scientific Publishing.

www.manaraa.com

Omotayo, F. (2015). Knowledge management as an important tool in organisational management: a review of literature. *Library Philosophy and Practice*, 1-23.

Otley, D. (2016). The contingency theory of management accounting and control: 1980–2014. *Management accounting research*, *31*, 45-62.

Paape, L., and Speckle, R.S. (2012). The adoption and design of enterprise risk management practices: an empirical study. *European Accounting Review 21*93), 533 – 564. doi:10.2139/ssrn.1658200.

Padro, F. F., Winwood, N., and Hawke, M. F. (2015). Utilizing qualitative components of risk management as evidence on how university strategies meet QA criteria and standards. In: *International network for quality assurance agencies in higher education biennial conference (INQAAHE 2015): Changing landscape of higher education: new demands on quality assurance*. Chicago. Retrieved from https://eprints.usq.edu.au/28697/1/INQAAHE%202015%20paper%5B2%5D.pdf.

Patton, M. Q. (2002). Two decades of developments in qualitative inquiry: A personal, experiential perspective. Qualitative social work, 1(3), 261-283.

Razali, R.A., Yazid. S.A. and Tahir, M.I. (2011). The determinants of enterprise risk managament (ERM) practices in Malaysian public listed companies. *Journal of Social and Development Sciences 1*(5): 202- 207.

Reddy, K. S., Prabhakaran, D., Jeemon, P., Thankappan, K. R., Joshi, P., Chaturvedi, V., & Ahmed, F. (2007). Educational status and cardiovascular risk profile in Indians. *Proceedings of the National Academy of Sciences*, *104*(41), 16263-16268.

Renault, B. Y., Agumba, J. N., & Ansary, N. (2016). An assessment of enterprise risk management process in construction firms.

www.manaraa.com

Risk Management and Insurance Society (RIMS) (2011). *An overview of widely used risk management standards and guidelines*. RIMS Executive Report. Retrieved from: https://www.rims.org/resources/ERM/Documents/RIMS%20Executive%20Report%20on%20Widely%20Used%20Standards%20and%20Guidelines%20March%202010.pdf

Peachey, T., Hall, D. J., and Cegielski, C. (2008). Knowledge management and the leading information systems journals: an analysis of trends and gaps in published research. *International Journal of Knowledge Management (IJKM) 1*(3), 55-69.

Rodriguez, E., and Edwards, J. (2014). Knowledge management in support of enterprise risk management. *International Journal of Knowledge Management 10*(2), 43-61.

Rodriguez, E., and Edwards, J. (2010). People, technology, processes and risk knowledge sharing. *Electronic Journal of Knowledge Management 8*(1), 139-150.

Ruzic-Dimitrijevic, L., and Dakic, J. (2014). Risk management in higher education institutions. *Online Journal of Applied Knowledge Management 2*(1), 137-152.

Sabato, G. (2009). Financial crisis: where did Rrsk management fail? *SSRN*, 1-17. Retrieved from http://ssrn.com/abstract=1460762.

Schein, E. H. (2004). *Organizational Culture and Leadership (Jossey-Bass business & management series)*. Jossey Bass Incorporated.

Setapa, M., Ariff, M., Zakuan, N., Zaidin, N., Saman, M., Sulaiman, Z., Saman, M., and Sulaiman. (2015). The impact of enterprise risk management practices on Malaysian public higher educational institution performance: a literature review. *2015 International Conference on Industrial Engineering and Operations Management (IEOM),* 1-7.

Shafiq, A. and Nasir, M. (2010). Risk management practices followed by the commercial banks in Pakistan. *International Review of Business Research Papers 6*(2): 308-325.

www.manaraa.com

Shafritz, J. M., Ott, J. S., & Jang, Y. S. (2015). *Classics of organization theory*. Cengage Learning.

Shortreed, J. (2010). Enterprise risk management and ISO 31000. *The Journal of Policy Engagement*, *2*(3), 9.

Siayor, A. D. (2010). *Risk Management and Internal Control Systems in the Financial Sector of the Norwegian Economy: A Case Study of DnB NOR ASA* (Master's thesis). Tromsø, Norway, Universitetet i Tromsø.

Simona-Iulia, C. (2014). Comparative study between traditional and enterprise risk management–a theoretical approach. *THE ANNALS OF THE UNIVERSITY OF ORADEA*, 274.

Spector, B. (2007). *Implementing organizational change: Theory and practice*. Prentice Hall.

Spies, M., Clayton, A. J., & Noormohammadian, M. (2005). Knowledge management in a decentralized global financial services provider: a case study with Allianz Group. Knowledge Management Research & Practice, 3(1), 24-36.

Stephen, P.D. (2001). Enterprise Risk Management". Journal of Risk Management of Korea. Vol 12, Number 1.

Rodriguez, E. (2010). *Knowledge Management Applied to Enterprise Risk Management* (Doctoral thesis). Birmingham, UK, Aston University.

Tah, J. H. M., and Carr, V. (2001). Knowledge-based approach to construction project risk management. *Journal of Computing in Civil Engineering 15*(3), 170-177.

Talet, A. N., and Talet, M. Z. N. (2014). Incorporation of knowledge management with risk management and its impact on is/it projects. In *International Proceedings of Economics Development and Research* (69), 29–37, Singapore, Singapore: IACSIT Press.

www.manaraa.com

Thompson, J. D. (1967). *Organizations in action: Social science bases of administrative theory*. Transaction publishers.

Tight, M. (2003). *Researching higher education*. London, UK: McGraw-Hill.

Tufano, P. (2011). Managing risk in higher education. In *Forum Futures 2011* (pp. 54-58). EDUCAUSE.

Van Donk, D. P., & Molloy, E. (2008). From organising as projects to projects as organisations. International Journal of Project Management, 26(2), 129-137.

Weick, K. E., & Quinn, R. E. (1999). Organizational change and development. *Annual review of psychology*, *50*(1), 361-386.

Whalen, P., Uslay, C., Pascal, V. J., Omura, G., McAuley, A., Kasouf, C. J., ... & Gilmore, A. (2016). Anatomy of competitive advantage: towards a contingency theory of entrepreneurial marketing. *Journal of Strategic Marketing*, *24*(1), 5-19.

Zadeh, M.G. (2010). *Risk management implementation in the Iranian construction industry from contractor's perspective* (Unpublished Master's Thesis). Johor, Malaysia, Universiti Teknologi Malaysia.

www.manaraa.com

Appendix 1

The problem diagnosis instrument

Part 1: Introduction

a) What is your understanding of ERM process?
b) What is your experience with ERM process in your organization?
c) What are your organization's most significant challenges related to ERM?

Part 2: Risk assessment: (identifying, analyzing, and evaluating)

a) What information-gathering techniques does your organization use for Identifying risks? Analyzing risks? and Evaluating risks?
    i. How would you rate your level of satisfaction with the organization's ability to identify, analyze and evaluate risks?
    ii. Do you have any suggestions to improve it?
b) What do you think about allowing the risk owners to routinely identify, analyze and evaluate risks in a structured way throughout the organization?
c) What role can technology play in risk assessment?

Part 3: Monitoring and review:

a) How would you rate your level of satisfaction with your organization's ability to re-visit and monitor risks?
    i. Do you have any suggestions to improve it?
    ii. What role can technology play in it?

Part 4: Communication and Consultation:

a) How do you evaluate the lines of communication for reporting the risk associated with your area?
    i. Do you have any suggestions to improve it?
    ii. What role can technology play in it?
b) How do you evaluate the lines of communication for determining the best approach for risk treatment/decision-making?
    i. Do you have any suggestions to improve it?
    ii. What role can technology play in it?

Part 5: Transparency:

a) How would you rate your level of satisfaction with the level of transparency you have now?
b) What level is ideal for ERM process and why?

www.manaraa.com

Appendix 2

The evaluation phase instrument

1. General feedback:

- What benefits did you expect to see and experience as a result of using the Risk Wizard system?
- What your immediate reaction when you were first introduced to the system?

As you become involved in KM system, did you discover other reasons for using the system that you did not initially anticipate?

2. System quality:

- What did you like and did not like about the tool?
- From efficiency perspective: What is your evaluation of the use of the systems to conduct ERM activities compared to the previous Human interaction?

3. Knowledge quality:

- Knowledge storage: How do you think your ability to access the organization risk knowledge and risks historical changes reformed your experience and involvement in ERM?
- Knowledge sharing: How do you think your ability to share your risk knowledge personal changed your perspective of ERM process?
- Knowledge transfer: How do you think the up-to-date risk knowledge sharing changed your perspective of ERM?
- Knowledge use: How do you think the risk knowledge sharing helped in risk identification, analysis, and risk mitigation?

4. Service quality:

- In your opinion, how effective do you think the Risk Wizard system has been in Improving risk communication among ERM owners?
- In your opinion, how effective do you think the Risk Wizard system has been in:
  - Encouraging ERM members to engage in higher-level thinking about risks.
  - Enabling collaborative Risk mitigating

5. Transparency and risks ownership:

- How Transparency and access to other people risks changed your experience and involvement in ERM?
- How risk ownership changed your experience and involvement in ERM?

www.manaraa.com