[Leading IT risk management—Relationship between communication and IT risk management performance]

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Abstract

Nowadays, business is highly reliant on information technology (IT). The IT systems confront risks and threats all the time, thus there is increasing necessity to implement powerful IT risk management. Previous studies indicate that effective communication can improve the overall risk management performance within an organization. Whereas there is absence of studies about the relationship between communication and IT risk management performance.

This thesis adopts qualitative research method and conducts interviews to collect data. This thesis investigates the relationship that how communication effects and communication barriers influence the IT risk management outcome. Furthermore, this thesis studies the stakeholders during the communication activities and proposes several recommendations to improve the communication effects and reduce the communication barriers in IT risk management process. This thesis contributes to the research gap whereas further improvement can be done with focus on a specific industry.

Key words: IT risk management, communication, effects, barriers, stakeholders

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1   Introduction

1.1   Background

From the first mechanical computer in the early nineteenth century to the current advanced laptops, information technology (IT) gradually plays an irreplaceable role in daily business operation. Nowadays, most organizations are highly reliant on IT and IT facilitates to improve the working efficiency and enhance the business performance. No matter in which industry or field the organization is operating, they are more or less utilizing the products or service of IT.

In this sense, once IT functions are exposed to threats and risks and do not work normally, these organizations can suffer serious outcomes. For example, downtime in Dell Data Centre can cause a direct business loss of $8,000 per minute, and it becomes more daunting when considering the indirect cost, like brand image, decrease in stock value, etc. (Regan, 2015). According to surveys and research from academic institutions, if the data server for a Fortune 500 company is down or not responding for an hour, the business loss varies from $ 84,000 and $ 108,000(Vision Solution, 2008). These outcomes are apparently severe to the business owners and leave a negative impact on the business performance. Therefore, there is necessity to manage the IT risks and threats under control to ensure the smooth business operation. Gradually, the roles of IT risk managers come into being. Usually the IT risk managers take care of the IT risk related activities and maintain stable IT environment for business. More specifically, IT risk managers identify, assess and mitigate IT risks with strategic approaches and implement overall IT risk policies within the whole organization, as well as providing technical support and trainings to enhance IT risk awareness among the employees. All the IT risk managers' work can be generalized into IT risk management.

Through IT risk management (ITRM), IT risks and threats, like hack attack, technical breakdown, and lack of data encryption, can be managed, mitigated and optimized. In order to achieve effective ITRM, IT risk controlling methods and risk responding mechanisms are employed in most large organizations. As the IT risks and threats are becoming increasingly complex, more and more organizations have emphasized ITRM on a higher level. This can improve the likelihood of maintaining stable business environment and further enable the management team to make risk aversion and balanced decisions in complex situations. As ITRM and business operation tied closely, it is no longer a simply technical issue to build up well-functioning IT in

risky environment, but a business approach to create sustainable business environment. In short, ITRM, as one of the most critical issues in nowadays business, is noteworthy and worth further study.

1.2   Research questions

Over years, scientists and engineers have developed plenty of methods to mitigate IT risks, laying solid technical foundation for ITRM. Utilizing these methods, organizations can start ITRM from scratch and build up extensive protection against IT risks. However, as mentioned before, the IT risks and threats are changing all the time, and it is difficult to identify a comprehensive approach to manage IT risks. In this sense, there remain technical gaps to update current ITRM approaches in timely manners, although the research work in ITRM has reached a certain level. On the other hand, this is a prevalent phenomenon in science that there are technical gaps between existing research results and future challenges. This leaves research space for talents to run the extra mile, developing and advancing scientific civilization to the next level.

Apart from the technical gaps, there is one particular gap worth further investigation about ITRM. There has been little research work studying the relationship between communication effects and ITRM performance. The significance to fill this research gap is presented both in theory and practice as follows:

In theory, Bakker et al. (2011) and Wheeler (2011) have stressed the importance of communicative effects in IT projects and both of them agree that IT project stakeholders should promote effective communication for smooth workflow and instant information sharing, but they are limited to IT project management and fail to go further studying about ITRM. Meanwhile, Hwang & Chen (2015) states that ITRM is a necessity rather than an option, as many organizations rely on IT systems to leverage gain and loss, implementing economical control and providing support for decision-making process. Although Hwang & Chen (2015) brings up an ideal approach to solve IT risks with proven successful testing results, they disregard the practical communicational barriers during the ITRM process.

Prior to Hwang & Chen (2015), Carcary (2013) proposes several suggestions to improve the ITRM implementation efficiency, whereas he overestimates the organizational policy and underestimates the interpersonal communication. Later study by Brousseau & Héroux (2013) reveals that ITRM is complex and requires participation of different departments, and therefore establishing a common understanding of IT risks through documentation effects is needed across different departments. But, he has not taken communication effects into consideration, which could be another influential factor in the ITRM process. In short, previous research

have studied the communication effects in IT projects and have proved the importance of ITRM respectively, but there is absence of research bridging communication effects and ITRM performance together.

Coming to the practical significance, communication barriers in ITRM process can decrease working efficiency, hinder project progress and put a drag on the ITRM implementation. Ineffective communication can lead to misunderstanding and misinterpretation, and this can be problematic to successful ITRM. The author has spent considerable time working as an IT technician, and according to the author's observation, it is often the case that ineffective communication between the IT risk managers and ordinary staff can lead to repetitive work, delay working schedule for the whole team.

For instance, if the IT risk is not communicated clearly among team members, IT risk managers may not be aware of the risk severity. Once they adopt a wrong response to the IT risk or classify the risks to a lower level, this can lead to great business loss. In addition, without effective communication, it is difficult to raise individuals' attention on ITRM. It is mainly due to the nature of IT risk. If the IT system is running smoothly in risky environment, it means that IT risk policy is well-functioned. In this sense, nothing happen to the IT system means good. As a result, people may take ITRM lightly and hold an overconfident view since they cannot see the direct outcome of ITRM. Therefore, IT risk managers should ensure effective communication to emphasize the importance of ITRM.

On the other hand, effective communication places a positive impact on successful ITRM. Firstly, effective communication in ITRM can increase the effectiveness and efficiency in ITRM process. For example, effective communication can shorten the time in information transferring and knowledge sharing, reducing unnecessary repeated work as well. Secondly, effective communication can help to establish common perceptions and understandings towards ITRM. Lastly, effective communication can contribute to developing a helpful working environment.

In addition, ITRM and other business processes are integrated more and more closely. ITRM can help to create a stable and reliable operation environment for other departments, including finance, marketing, sales, manufacturing, research and development, etc. Hence, successful ITRM performance indeed places wider practical impact on the scope of business areas.

Based on the aforementioned analysis, in terms of the theoretical and practical significance, this research question, what are the relationships between communication and ITRM performance, is worth further investigation.

1.3 Aim and Objectives

In order to study the relationship between communication and ITRM performance, this thesis divides this research topic into four sub research questions:

1. How does effective communication improve the ITRM performance?

2. How do communication barriers impede the ITRM performance?

3. Who are the communication stakeholders in the ITRM?

4. What can be done to improve communication effects among these stakeholders in ITRM process?

These four questions cover wide aspects of communication and ITRM, providing comprehensive points of view to anchor the research question. This thesis starts the research work from reviewing previous study, designing research methodology and then conducting data collection. Based on the research data, this thesis aims to reveal the relationship and explain correlations within the discoveries. This thesis also intends to propose feasible recommendations to promote communication effects and reduce communication barriers in ITRM.

This thesis targets IT risk managers and other managerial personnel, like business development managers, that may play similar roles within the organization, in order to increase their awareness of communication effects. This helps them grasp the whole situation and make dynamic adjustment, making full use of available resources to manage IT risk. This thesis can also facilitate ordinary staff and students that are interested in ITRM to gain a better understanding of this area. An overview of relevant research work is presented in this thesis.

Overall, this thesis aims to fill previous research gap and contribute to the study of communication effects in ITRM.

1.4 Outline of the Thesis

In the first chapter, importance of ITRM is introduced and the significance of the research topic is further discussed on theoretical and practical aspects. Later in this chapter the research aim and target readers are also presented.

In the second chapter, important previous research work is reviewed and explained explicitly. In the end, theoretical framework is brought up for the following research work.

In the third chapter, methodologies to investigate the research question are presented. Research method and data collection method are well explained, along with the validity and reality.

In the fourth chapter, findings are well discussed under different interview questions. Strong links are brought up between the findings and the research questions.

In the last chapter, conclusion and recommendation for further improvements are carried out. Research limitation and future research direction are indicated as well.

2 Literature/Theoretical Review

This chapter contains two parts: The first part is an overview of important terminologies and relevant theories of the research questions. This part reviews previous research achievements around ITRM and further equips the readers ability to understand this thesis in depth. The second part describes the theoretical frameworks, and builds up foundation for further analysis work.

As mentioned before, the theoretical and practical significance of studying this research question is very meaningful. Previous academic work has studied the relationship between communication and enterprise risk management performance, lacking of specific research in the relationship between communication and ITRM performance. Therefore, built upon previous work, this thesis further studies the relationship between communication and ITRM performance, making an extension of previous work. Moreover, this thesis also studies the stakeholders in ITRM communication and how to improve communication effects among these stakeholders. This is indeed an enrichment of previous studies.

2.1 Theory review

2.1.1 Risk

Over years, the definition of risk has evolved and has been combined across disciplines. Up to now, the most universal accepted definition of risk is " The combination of the probability, or frequency, of occurrence of a defined hazard and the magnitude of the consequences of the occurrence" by the Royal Society (1992). Risk is also perceived as a combination of threat and vulnerability, and the overlap of threat and vulnerability determine the level of risk (Akintoye & MacLeod, 1997). Further, as argued by Harner (2010), risk contains the possibility of loss and the corresponding consequences of that loss or risk event. Recently, risk is defined as the possibility of a hazardous occasion and its consequences if it occurs and risk can be reduced and mitigated through controlling mechanisms (Baracaldo & Joshi, 2013).

Among these dominant definitions, most of them are related to negative outcomes. According to a survey conducted by March and Shapira (1987), more than 80% managers within the research group link risk to negative outcome, and it is also associated with danger, hazard or threat (Bannerman, 2008). Similarly, an undesirable

outcome (loss) will be triggered if actions or activities are chosen in risky environment (Stroie & Rusu, 2011). Risk can put business in danger and cause great financial or non-financial losses to the organizations. Risk could also make chaotic situations for the business operation, and in some extreme cases, the whole team could become demoralized and disintegrated. Nevertheless, risk is a common issue within the business operation context.

However, there are inconsistencies with these arguments, Bannerman (2008) admits that the common conception of risk is considered in less precise ways: people relate risk to the potential loss but rarely figure out the opportunity of future development that risk would bring; people also ignore the organization-specific vulnerabilities and capabilities to respond risk. He further concludes that in terms of the narrow definition of risk, a wider conceptualization should be adopted. In accordance with Bannerman (2008), Hwang (2015) stated that risk could lead to a positive outcome if risk is perceived and mitigated appropriately. In this sense, risk can be used to examine current risk controlling and mitigation strategies, and indicate directions for further improvement. Hence, it means that the allocation of available resources (time, money, employee, etc.) could be optimised and business performance would be improved. Indeed, each risk is an opportunity for an organization to review current strategies and make an adjustment. If the risk is appropriated right, a positive outcome can be expected, which is also commonly described as "opportunity risk".

It is argued that organizations take risk as early warning signals and incubate risk through normalization of deviance, in case that the risk evolved into imminent danger (Kaplan & Mikes, 2012). Actually, in business context, risk could affect economic performance and professional reputation in both positive and negative ways, as approved by international organization for standardization (ISO, 2009). Svatá & Fleischmann (2011) once described that risk and business value are just like two sides of the same coin and this inherency applied to all the industries. Actually, positive and negative risks co-exist, and it is largely dependent on individuals' perception, since each risk stands for an opportunity for improvement.

2.1.2　IT risk

IT risk is the probability that threats and dangers can impact the information system negatively and exercise the potential vulnerability, leading to unexpected or undesired outcomes to the business, within the information system context (Spremiü et al. 2012). According to Wiesche & Schermann (2013), particular IT risks arise from IT projects, outsourcing relationship and application management, etc. As business and IT are closely integrated in most organizations, IT risk is considered as business risk by Svatá & Fleischmann (2011), and interpreted as "risk occurs during the use, ownership, operation, involvement, influence and adoption of IT within an enterprise".

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Indeed, IT risk covers extensive business area, ranging from internal auditing to financial controlling, from business operations to IT compliance (KPMG, 2015). For example, one of the common IT risks is information leaking, especially when the information should be confidential, for instance, username and password for certain accounts, credit card information, corporate sensitive data, etc. In addition, data accuracy can be another IT risk, since all the data stored in the database should be original and can not be changed without authorized access. IT risk also includes the technical problems and IT helpdesk issues. Typical examples can be database downtime, unauthorized access to sensitive resources, hack attack, spams, and applications from unknown sources, etc. In addition, other IT risks such as natural disasters could make damage to the IT infrastructures and hardware as well. In general, Westerman and Hunter (2013) categorized IT risks as follows: access risks (e.g. unauthorized access to sensitive resources), availability risks (e.g. technical faults), accuracy risks (e.g. data accuracy) and other risks (e.g. natural damage).

2.1.3 Enterprise Risk Management

The Commission of Sponsoring Organizations (COSO) defined enterprise risk management (ERM) as: "a process, effected by an entity's board of directors, management and other personnel, applied in strategy setting and across the enterprise, designed to identify potential events that may affect the entity, and manage risk to be within its risk appetite, to provide reasonable assurance regarding the achievement of entity objectives." ERM is a comprehensive approach contains risk modelling and integration of risk assessment and response practices (Harner, 2010).

Recently, COSO revised the ERM framework with eight interrelated components from the way that business is operated—Internal Environment, Objective Setting, Event Identification, Risk Assessment, Risk Response, Control Activities , Information and Communication, and Monitoring. These eight components build up the basic context of ERM and serves as the theoretical foundation for further research work in this thesis.

2.1.4 IT Risk Management

Bannerman (2008) perceived ITRM as "a set of principles and practices aimed at identifying, analysing and handling risk factors to improve the chances of achieving a successful project outcome and/or avoid project failure". Additionally, he stressed that ITRM is not only about identifying and assessing risk, but also about reacting to threats in time-manners with strategic approach. An ITRM function assists to identify IT threats and provides proactive responses to combat IT risks. In addition, it ensures an effective involvement with regulations and compliance, consolidating a sustainable process for transparency and accountability (KPMG, 2015).

According to Stoneburner et al. (2002), the objectives to implementing ITRM is as follows: "(1) better securing the IT systems that store, process, or transmit organizational information; (2) enabling management to make well-informed risk management decisions to justify the expenditures that are part of an IT budget; and (3) assisting management in authorizing (or accrediting) the IT systems on the basis of the supporting documentation resulting from the performance of risk management."

In general, the process of ITRM has been classified into three procedures, and these three components are in line with ERM, including IT risk identification, IT risk assessment and IT risk mitigation. :

IT risk identification contains two parts: cataloguing unexpected negative results and possible positive opportunities; initial assessment of possible influence that IT risk may cause to the organization. IT risk is identified in terms of its relation and effect to certain business objectives (Spremiü et al. 2012).

Spremiü et al. (2012) stated that in order to characterize IT risks with typical features, such as severity and frequency, IT risk assessment is usually expressed in financial terms. He further indicated that IT risk management assessment included: 1) evaluation of vulnerabilities 2) possibility of occurrence 3) assessment of business impact (mostly in financial items) 4) further preparation for response.

IT risk mitigation is a way to control risk damage to a tolerable level, utilizing appropriate countermeasures (Storie & Rusu, 2011). It is a way for the organizations to reduce IT risk and avoid financial loss. This stage is influential to solve risks, supporting the organization to tackle the tactic objectives and achieve the business goals.

Most organizations have employed IT risk management function to ensure the stable and normal operation of business. As ITRM contains largely interpersonal interaction, communication challenges in this process cannot be ignored. For example, if the employees do not understand what ITRM exactly is, it can be difficult for them to communicate with IT risk technicians about IT risks. In the following work, communication effects and communication barriers will be further studied.

2.1.5   Communication

Communication definitions develop over years. Initially, communication contains information creation and information sharing, promoting thoughts exchange among individuals within a project team (Rogers et al. 1981). Similarly, communication is defined as "process of exchange of information between sender and receiver to equalize information on both sides" (Otter& Prins, 2002). In accordance with Otter and Prins (2002), Cohen (2009) proposes a framework of communication flow— "informer-medium-client", developing the definition of "sender and receiver" into

"informer and client" respectively, and describes the "process" as "medium" in the communication flow, pointing out the necessity to study each part of communication flow. Further, Reed and Knight (2012) indicate this communication flow "increase complexity and necessitates parallel consideration" in complex communication. The most widely used method to communication is speaking due to its immediate and spontaneous direct (Zulch, 2014).

In organizational context, mostly communication behaviours can be categorized into organizational communication. Organizational communication is a process that information transfers among certain organizational members to accomplish individual and common goals, with largely emphases on frequent interpersonal interactions (Hahn et al. 2013). Organizational communication enables information flow within the whole organization among the target informers and clients. According to Spaho (2013), organizational communication is able to contribute to organizational learning and success, as well as developing solidarity and group cohesion.

2.2   Theoretical framework

2.2.1   ITRM and ERM

Prevalent ITRM frameworks are ISO 2700x, Risk IT, Sarbanes-Oxley, COSO, Basel II, and these frameworks establish benchmarks for ITRM sector. In order to generate initiatives for organizations to highlight IT risk, enterprises should cover adequate risk depth and details and meanwhile align its IT risk management into overall ERM from a holistic point of view. More specifically, enterprises face various kinds of business risks in daily operation, including compliance, finance and technology risk (Svatá & Fleischmann, 2011). Besides, ITRM contained organizational and technological procedures, and all these procedures should be aligned with enterprise business risk, otherwise they did not make any sense (Spremiü, 2012). Controlling business risk is a crucial part of responsible business operation and, considering the influence of ITRM, there is reason to clarify IT risk into overall ERM.

Furthermore, aligning IT risk management into overall ERM framework will lead to cost-effective risk mitigation and a higher return on investment (ROI), and promote a deep understanding of business priorities and related risks, protecting and enhancing the values of the organization. Due to limited resources, aligning ITRM into ERM, will achieve optimisation of resources allocation. This does not mean either ITRM or ERM is compromised. Instead, as discussed above, ERM contains ITRM, therefore resources do not need to be spent repetitively in the same area, and this leaves space for cost reduction. Summarizing previous research, Carcary (2013) concludes that ITRM is an integrated part of ERM and involved holistically managing the enterprise risk portfolio.

2.2.2 Communication effects

In the book "The Theory of Communicative Action", Habermas(1984, p.286) states that " In communicative action participants are not primarily oriented to their own individual successes; they pursue their individual goals under the condition that they can harmonize their plans". He emphasizes the communicative effect could unite people working towards same direction and further discusses that well-maintained communicative action improves working efficiency. Church and Waclawski (2007) states, "Good communication is usually described as some combination of being open, honest, participative or direct with others." On the contrary, ineffective communication might arise from arrogance, indecisiveness, disorganization, stubbornness, negativism, cowardice and distrust in managerial behaviours (Pacelli, 2010). Indeed, effective communication and successful project outcome go hand in hand (Campbell, 2011).

Effective communication skills will facilitate mutual understanding and encourage a positive project outcome. Therefore, effective and efficient communication within project members places strong impacts on project success (Zulch, 2014). In another research work, Bakker et al. (2012) further proposed that communicative effects are engaged in the enterprise risk management activities between team members, especially during risk identification and risk analysis process. Under this context, effective communicative actions are conducive to the success of ERM.

Built upon the view that ITRM is in line with ERM, and effective communication actions are conducive to the success of ERM, this thesis studies the relationship between communication and ITRM performance. The theoretical framework is presented in Figure 2.1.

Figure 2.1 Theoretical framework

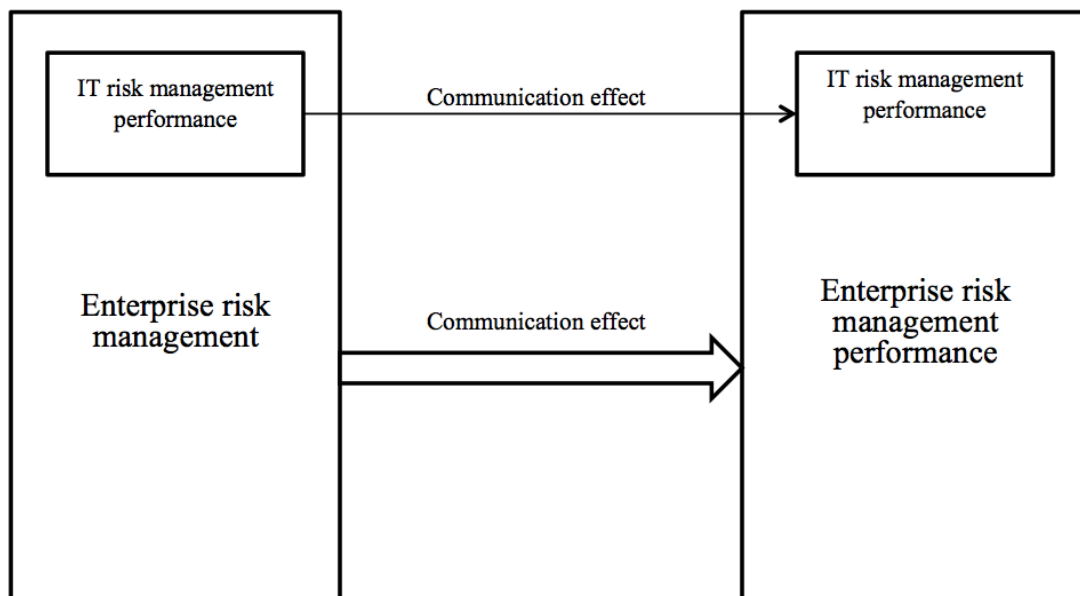## 2.3   Chapter Summary

This chapter gives detail description about important concepts, including risk, IT risk, enterprise risk management, IT risk management and communication from a comprehensive point of view. In addition, this chapter also presents the connection between ITRM and ERM, and communication effects in risk related activities, building up theoretical framework for further research work.

3 Methodology

3.1 Research Approach

This thesis starts research work with an exploratory approach to probe into the relationship between communication effects and ITRM performance. This thesis adopts qualitative method to collect research data.

The reason why qualitative method is selected rather than quantitative method is as follows: qualitative research is more useful than quantitative in refining theories and hypotheses through preliminary exploration of a topic (Sofaer, 1999). Qualitative research aims to gain understanding of social life and generate words instead of numbers for data analysis (Brikci, 2007). It is suggested to apply qualitative research to understand the situation if the research area is new. Furthermore, qualitative study is interpretive since it focuses on the meanings of human affairs as presented from different views; meanwhile it is personalistic, seeking uniqueness among individual perceptions and honouring diversity (Robert, 2010). In addition, qualitative research can provide complex textual descriptions towards research topic from a "human" side and help identifying intangible factors like social norms, individual perceptions, etc. (Berkeley, 2015). On the other hand, quantitative research is a way to test objective theories through statistical evidence, attempting to establish statistical correlation and causation based on objective measurement and observation (Broomfield, 2014). Although quantitative method is more logical and data-driven from mathematic perspective, there is lack of initial assumptions and objective examples regarding this topic.

As stated above, this thesis starts a new research topic and fills a research gap in previous work, aiming to figure out concrete issues from the practical experiences of relevant personnel. That's why qualitative method is adopted in this thesis.

Among the three common approaches for qualitative research: participant observation, interviews, and focus groups, interview is adopted for the data collection method due to the following reasons: Compared to participant observation and focus groups, interviews can provide effective verbal information and build up ways for interviewees to express their thoughts freely (Berkeley, 2015). Interviews can be used to get background information as well as expertise from an individual, gathering factual material and data (Harrell et al. 2009).

This thesis intends to gain deep insights from interviewees' experiences and perceptions. Interviews are therefore applied for the data collection. The interviewees are selected from different industries, including dairy industry, banking, automobile industry and higher education. These four industries cover a wide range and each differs from each other. The dairy industry stands for the food industry and the fast moving consumer goods (FMCG). The banking and higher education represent the financial and educational sectors respectively. The automobile industry characterizes the mechanical industry and the manufacturing industry as well. Indeed, these four industries concern national economies and people's livelihood, and this would enable the research data more representative and the research result more prevalent.

3.2   Data Collection Method

In total, five interviewees are selected. All of them have accumulated considerable working experience within IT sector and they have proven career achievements in their own field. In this sense, the interviewees can provide valuable insights in ITRM. Moreover, the slight difference among their job responsibilities can complement each other, and they can answer the interview questions from different angles. This helps to collect data in a comprehensive approach and improve the accuracy of the research data.

The length of each interview lasted from 20-30 minutes, varying slightly due to the extent to which the interviewees involved and the length of their answers. These interviews are mostly conducted via telephone, because of the remote distance. For research use only, these interviews are recorded and concurrent notes are made during the interviews.

Considering the research purpose, semi-structured interviews are employed in the research. Semi-structures interviews covers extensive open-ended questions based on the research topic and it allows interviewer and interviewee have in-depth discussion in the context of predetermined questions (Mathers et al. 1998). Semi-structured interviews provide directions for interviewer to probe into detailed information and understand the answers thoroughly (Harrell et al. 2009). Compared to structured interviews and unstructured interviews, semi-structures interviews are more flexible allowing interviewer can delve deeply into the research topic and at the same time ensuring all the investigation is in the right direction.

These semi-structured interview questions are open-ended questions aiming to absorb sufficient information around research topic. In total, each interview contains seven basic questions and these interview questions are actually digestion of previous research. And several additional questions might be asked under the basic question if the information is not sufficient.

The interview starts with "Could you briefly introduce your work?" followed by " How does your work relate to ITRM?". This provides the interviewer an initial impression about the interviewees' backgrounds and from which angles their answers are presented. The interviewer (author) holds a bachelor degree in Information Engineering, and this allows the author to delve into the technical aspect. Consequently, this facilitates the interviewer to further discuss details in the following questions.

The third question is about the internal atmosphere in the company, since the communication effects in ITRM are largely influenced by the corporate policies, cultures, and internal regulations. This question also helps to understand to which extent that the corporate highlight the IT risks. The fourth question begins to probe into the communication effects in ITRM. It requires the interviewees to express their thoughts and ideas towards communication effects based on their personal experience. The fifth question digs into the communication barriers that the interviewees have ever met. Through this question, the interviewer can gain concrete examples how the communication barriers could impede the outcome of ITRM. The sixth question talks about the stakeholders in the ITRM process and how the communication within these stakeholders are related to the ITRM performance. It helps to figure out who are involved in this process and the relation between communication and ITRM performance.

In the end, an open question is brought up for further suggestions to promote communication effects and reduce communication barriers in the ITRM process. This helps the interviewer (author) to know what methods are adopted and implemented in these reputable companies and further come up with feasible recommendations regarding the communication effects.

3.3   Data Analysis

As interviews are used as primary method to collect data for this thesis, some analysis techniques are applied to conduct data analysis. As suggested by Mathers et al.(1998), data analysis is conducted as follows:

First of all, the recorded interviews are transcribed into text, it is time-consuming though. Some important points might be ignored if the interview data is analysed via audios. Instead, textual data allows in-depth and in-detail analysis. Along with the transcripts, concurrent notes are also utilized in this thesis, to provide additional information.

Secondly, content analysis is applied. The important information is extracted and shown in the tables. Each transcript is gone through thoroughly and all these

information provided are interpreted and related to the research. A daily interpretive analysis (DIA) is employed in this thesis, which means that all the interview interpretation work are finished on the interview day, in case that important ideas and thoughts are missed (Collecting & Analyzing Interview Data, 2015).

Overall, the aim of data analysis is trying to yield as much information as possible for further research work in the following chapters.

3.4   Validity and Reliability

Validity is related to the response accuracy around a given topic and reliability is influenced by the consistency and standardization across different interviewees (Campion, et al. 1998).

These five interviewees have accumulated considerable years of working experience in ITRM sector, which allows them to gain value insights into ITRM. This enables these interviewees to provide highly valuable response from their perspectives. Furthermore, these interviewees are top performers within their companies and they are more experienced compared to the other employees, enhancing the response accuracy.

This thesis takes semi-structures interviews, and all these basic interview questions are pre-determined. All the interviewees are asked the same questions. It is indeed a standardization process, which improves consistency (Campion, et al. 1998).

3.5   Chapter Summary

This chapter starts from the introduction of qualitative research, followed by the research design for the whole thesis. This thesis conducts semi-structured interviews as primary data collection method and further illustrates how to analyse the transcripts of the interviews. In the end, validity and reliability are presented.

4 Analysis and Discussion

4.1 Analysis of the data

This thesis takes five interviews with five IT managerial personnel across four industries in total. Among these interviews, four interviews are conducted via telephone and one interview is an on-site interview. Details are described in Table 4.1 as below:

Interviewee	Status	Format	Length	Recording
A	Conducted via telephone on May 5th, 2015	Semi-structured	20min 18sec	Audio recorded and concurrent notes
B	Conducted via telephone on May 5th, 2015	Semi-structured	25min 30sec	Audio recorded and concurrent notes
C	Conducted via telephone on May 7th, 2015	Semi-structured	29min 31sec	Audio recorded and concurrent notes
D	Conducted in person on May 8th, 2015	Semi-structured	23min 58sec	Audio recorded and concurrent notes
E	Conducted via telephone person in May 11th, 2015	Semi-structured	27min 25sec	Audio recorded and concurrent notes

Table 4.1 Interview details

4.1.1 Who is the IT risk manager?

Table 4.2 stands for the answers of the first interview question—Could you briefly introduce your work? Meanwhile Table 4.3 represents the answers of the second interview question—How do your work relate to IT risk management.

A	IT risk manager in Automobile industry, planning, designing and implementing IT risk management policy, risk identification, risk assessment, risk evaluation, risk mitigation and risk reporting
B	IT solution manager in Automobile industry, finding the optimal IT solutions in business challenges and solve business issues, collaborating with clients and negotiating with stakeholders
C	IT technical support technician with seven years working experience in Banking, maintaining a wide range of operations systems, including web, PC/Software and mostly about internal applications.
D	IT helpdesk technician with five years working experience in Higher education, installing and configuring computer hardware, software; website and IT infrastructures maintenance
E	IT Maintenance technician in dairy industry, Cisco Certified Network Professional (CCNP), responsible for the maintenance of IT system and the network configuration, and responsible for internal IT system report

Table 4.2 Answers to interview question 1 (Q1)

A	Responsible for the IT risk identification, assessment and mitigation, implementing and managing IT frameworks, developing key performance indicators (KPI), checking the IT compliance on a regular basis
B	Making sure that IT solutions have taken consideration of the potential risks and it is optimal; developing alternative solution or substitute in emergency cases to keep all the business under control
C	Solving the desktop issues and faults, hardware and software troubleshooting, disaster recovery, technical support
D	Troubleshooting, and providing technical support to the staff and resolving user and batch issue
E	Technical support, maintenance of IT network, IT infrastructure, check the data connection and system accuracy

Table 4.3 Answers to interview question 2 (Q2)

These two tables illustrate the professional background of the interviewees and how these interviewees' job responsibilities are related to ITRM. From Table 4.2, we can find that all these interviewees hold significant working experience in the IT sector.

This greatly improves the quality of the interview data and lays solid foundation for the further research work. In Table 4.3, we can observe that two interviewees (A&B) work extensively on strategically ITRM and the other three interviewees (C, D&E) focus more on technical support. All their job responsibilities are highly exposed to ITRM.

4.1.2   The role of ITRM in organization

Table 4.4 gives answers of the third interview question—Does your organization promote an atmosphere of IT risk management?

A	"We operate business in risky environment, and we are facing risk every time and every day" people proactively respond to IT risks and try to mitigate risks at an early stage
B	"Risk is involving in our culture" "weekly meetings, action plans, and see what we need to do" "The whole company implement powerful risk policies, no matter in finance, purchasing, IT, etc…"
C	"Definitely yes". Setting up regular trainings to the ordinary staff to make sure that what they are doing are in compliance. "we support the ordinary staff, but not take over responsibility, we need to balance how far we can step in…"
D	"Not so much…, the organization publish my contact and everybody can get access to me once they face IT problems and desktop issues.." "We face less external risks but we have more technical issues…"
E	"It's okay." In terms of the industry feature, in logistic and production department they highly stress the importance of ITRM due to the highly reliance on IT systems

Table 4.4 Answers to interview question 3 (Q3)

We can figure out that in the banking industry and automobile industry, both of them promote an atmosphere of IT risk management. Within their organizations, they have implemented different kinds of trainings, meetings, and plans to manage IT risk. Considering the industry feature, it is reasonable that these corporations promote an atmosphere of ITRM. For example, in the banking industry, if a hacker attacks the banking database and he transfers the money to his own account, this can cause great financial loss to the bank. Potentially, this will hurt the reputation of this bank as well. Therefore, it is necessary to implement powerful ITRM in the banking industry.

Coming to the automobile industry, this industry heavily relies on the IT systems for the logistic and transportation. They use the IT systems to calculate the transportation cost, the transportation capacity, and track the delivery information. They need to deliver the components as well as the final products (cars, trucks, etc.) to different places, and this requires highly reliable IT system. Hence, the significance of ITRM in automobile industry is apparent. This observation also applies to the dairy industry, and to some extent, the dairy industry requires more trustworthy IT systems to control external factors, like low temperature storage.

When it comes to the higher education organization, the overall IT systems are exposed to fewer risks. The most common risks arise from the fault of the laptops, IT infrastructures, website maintenance, etc. It is less likely that the IT system face external threats and risks. Therefore, it seems reasonable that the technician in the higher education argues that the risk awareness atmosphere is "not much".

4.1.3   Communication and ITRM performance

Table 4.4 gives the responses of the interview question—How do you perceive communication effects in IT risk management? These insights from interviewees across different industries provide empirical examples that how communication effects can improve ITRM performance. All their thoughts and comments can contribute to addressing the previous research question mentioned in chapter two.

As we can see in Table 4.4, all the interviewees acknowledge the communication effects in the ITRM process. Interviewee A proposes a concept—risk communication. Basically he explains the risk communication as communication between risks related participants. He further argues that the risk communication is essential in the ITRM process, especially when the organization intends to carry out new risk policies or revise previous policies. Risk communication enables everyone to understand the risk related activities clearly and provide transparency and accountability in the implementation process. Likewise, Interviewee B asserts that effective communication helps to make ITRM decisions and deliver the expected results. Effective communication can shorten lean time and improve the overall effectiveness and efficiency.

In the banking industry, communication effects have reached a higher level compared to the others. It is very vital that everything is communicated clearly in this industry. The technician he needs to be aware of what is going on and what happens to the IT system. Therefore, he can respond to the faults in timely manners.

In the higher education sector, communication could facilitate to improve the working relationships and exchange useful information about IT risks. Once communication strengthens the working relationship, the ordinary employees are more willing to approach the technicians and make reports to them. And the IT technicians can solve

the system fault more quickly. As a result, the ordinary employees are more willing to keep effective communication with the IT technician. This is indeed a virtuous circle.

A	"Risk communication is essential, effective dialogues within the whole company are necessary…" " Promote transparency and awareness of specific issues…" Effective communication is prerequisite to the IT risk management operation and it applies to other departments as well.
B	Stress the importance of effective communication; improve overall effectiveness and efficiency; "communication implementing risk management decisions…" Shorten the whole project time.
C	" It's very important that we know what is going on, what happened to our system…" " Communicating clearly and report clearly…" "Tell my colleagues what to do…" " Deliver effective information and training programs is necessary and it is what we have done"
D	"Exchanging information about IT risk related topics" and strengthening the working relationships
E	" Foster the trust in IT system", "communication is key to the success of IT risk management" " Through communication, we implement IT compliance rules and IT risk policies.

Q4.5 Answer to interview question 4(Q4)

In the dairy industry, the IT support technician holds the opinion that communication is key and it can foster trust within organization. Communication helps the ordinary employee to understand the reliance of the IT system. Secondly, once something wrong happens to the IT system, the employees won't be in a panic cause they trust the technicians. In this sense, non-technicians and IT technicians work closely as a team, building up a positive working environment.

4.1.4 Communication barriers in ITRM

A	One time to provide the IT risk and IT compliance training to the employees, I (interviewee) stressed some common mistakes in IT compliance and asked if they need me to clarify something unclear to them, they said nothing. But after that meeting, some of the employees still repeat the same mistakes.
B	When we (interviewee) contact with IT colleagues from the parent company, they seem not to understand me quite well. Sometimes when we have meeting I have to write down the meeting guideline and send them in advance. It is very time consuming.
C	We try to break down the communication barriers during our work. ITRM is vital in our business and we have open door policy, allowing everyone to acquire and share information.
D	Not familiar with the terminologies, failed to describe the situations; sometimes they (staff in the university) use wrong terminologies e.g. internet VS intranet; local area work (LAN) VS wide area work (WAN); make remote support difficult, and have to provide on-site support.
E	Some work should be documented and some working process should be in line with the compliance rules and auditing rules. They (employees) are not willing to follow these tedious procedures somehow but they also do not say it to me.

Table 4.6 Answer to interview question 5 (Q5)

Table 4.6 provides the interviewees' experience of communication barriers in ITRM process. All these input from the interviewees can be leveraged to address the sub research question—How do communication barriers impede the ITRM performance?

In the automobile industry, Interviewee A gave an example of where communication barriers might exist. Once after his IT risk training, his colleagues made the typical mistakes he presented. He thought that the communication barriers existed in the training process. His colleagues could have taken the opportunity to ask for more details during the training. However, his colleagues did not express their concerns and doubts straightforward. As a result, his colleagues still made the same fault, which could be problematic in the long run.

Interviewee B further argued that the language barrier could also decrease the communication effects in the ITRM process. Since for some countries, English is not widely used and people may have difficulties in communicating with the others in English very well. Moreover, language barriers could decrease the working efficiency and add extra work, which is also harmful to ITRM, especially when the business is operated in global environment.

In the banking industry, Interviewee C did not list any specific barriers in communication process. He mentioned that in his organization, they tried to break down the communication barriers with several policies, no matter in IT function or other functions. Like the open door policy, once the employee figures out some facts that could be influential to the IT systems, they can just bring the questions to the risk departments directly. By doing so, they reduce the risk responding time and decrease the possibility of huge financial loss. As banking industry is highly sensitive to external IT risks, they are striving their best to break down the communication barriers.

In the higher education, Interviewee D pointed out that his colleagues are not familiar with relevant terminologies. Even worse, they used the wrong terminologies to describe a situation. This could make simple work become complicated. For example, Internet and intranet, they refer to different things. Internet means the electronic communication networks connecting the computers and IT infrastructures globally. Intranet means that the electronic communication networks connecting the computers and IT infrastructures within the organization. If the employee picks up the wrong word, the IT technicians could work on the totally different thing. Moreover, this also adds difficulties for remote work, and some on-site support has to be provided. Thus, the unawareness of terminologies could be a communication barrier in ITRM.

In the dairy industry, the interviewee E stated that it could be tedious work to follow the IT compliance rules and IT risk policy. The employees they might be unwilling to work under these policies, but they do not express their concerns to the IT technicians. This could be problematic to the working atmosphere in the long run. Employees do not understand why they have to these complicated work but they just simply follow the policy, which could lead to negative morale to perform their job.

4.1.5   Communication and stakeholder

This table presents the answer of the sixth interview question—Who are the communication stakeholders in ITRM. The sub chapter helps to identify the communication stakeholders in ITRM, addressing the sub research question with concrete examples.

As presented in Table 4.7, we can observe that across these four industries, almost all the members, including non-technical employees, IT employees and management team are engaged in ITRM. In general, from the entry level to the top level, all these members are stakeholders in ITRM communication activities as long as their work contains deeply interaction with IT. However, the exact positions differ slightly due to the industry type.

A	IT technicians, all the staff in the organization as long as they use laptops as part of their work. "If the communication is well, it is easy to get the task done. " On the contrary, ineffective communication will impede the working progress and leave a negative impact on ITRM performance. " As we are a company in risky environment...", the organization promote effective communication within these stakeholders.
B	All the members that are related to IT infrastructures. Efficient communication within these people certainly improves the ITRM outcome, in terms of financial cost, time, efforts, etc.
C	Including the management, financial service, technical service, administration, lawyers, auditors, etc. " We are a service company, and our IT risk strategies and policies covers all the departments..." The implementation of an IT risk policy, from the beginning to the end, and the total performance are highly determined on the communication effects.
D	Teachers and students, website users. Effective communication greatly reduces unnecessary work and improves the efficiency to solve the technical issues.
E	IT technical department, logistic, purchasing, supply chain, finance department, etc. Communication within these departments, within these employees is extremely important.

Table 4.7 Answer to interview question 6 (Q6)

In the automobile industry, Interviewee A and Interviewee B believe that effective communication within these stakeholders is able to improve the outcome of ITRM in term of many aspects, like financial cost, working time, efforts, etc. Likewise, Interviewee C considers that the implementation work of an IT risk policy are highly determined on the communication among these stakeholders. Interviewee D and Interviewee E also emphasize the communication effects in their own specialization, reducing repeated communication work and saving working time for the stakeholders.

Overall, the stakeholders in ITRM communication activities cover wide range, and the communication work within these stakeholders can be influential factor to successful ITRM.

4.1.6   Possibilities for improvement of ITRM

A	Trainings to improve the communication effects, multiple channels to communicate, including face-to-face, meetings, visual meetings, telephone conversation etc.
B	Develop risk culture in the organization, keep focused on the risky factors and enhance risk awareness among all the employees
C	Maintain the current risk strategies, like IT risk communication mechanism, keep important information repetitive and "stay hungry, stay foolish." Always standby the opportunity for improvement
D	Giving trainings to employees, regular meetings with colleagues, and IT risk manuals are necessary.
E	IT risk attention from the management team and IT risk awareness from the employees, need more focus within the whole organization

Table 4.8 Answers to interview question 7 (Q7)

The table presents the contents extracted from the question—Could you see any improvements for current ITRM in terms of communication effects? All these suggestions from the interviewees contribute to the addressing last sub research question as proposed in the second chapter.

As suggested by these five interviewees, communication activities in ITRM can be improved in the following aspects: Firstly, developing multiple channels to communicate, including face-to-face, meetings, telephone conversation, etc. These cross channels can maximize the communication effects in ITRM performance. Moreover, these channels can complement each other, and establish comprehensive ways to promote effective communication. Secondly, maintaining IT risk awareness throughout the whole organization. The awareness can be helpful in creating transparent and consistent communication in ITRM. People within the organization are aware of the importance of ITRM, and therefore they tend to be more proactive towards risk communication. Lastly, as Interviewee C mentions, " Stay hungry, stay foolish", organizations should stay abreast with the changeful IT risk environment, and seize every opportunity for improvement in ITRM. Only in this way, can the organization develop and manage IT risks in a sustainable way.

4.2   Chapter Summary

This chapter we discuss the main findings during these interviews. These interviewees work closely with ITRM and all of them are experienced in ITRM. The findings can be generalized as follows: Effective communication can shorten the project time of

ITRM and improve the working efficiency by reducing repeated work and initial IT risk identification. Communication barriers can add extra workload and lead to a worsen risk situation, and language barriers require additional work as well. All the members across all the levels can be the communication stakeholders as long as their work concerns deeply interaction with IT. Further improvements can be done in the forms of IT risk communication and IT risk learning. These findings have well addressed the research questions proposed in the second chapter.

5 Conclusion and Recommendations

5.1 Conclusion and Recommendations

This thesis studies the relationship between communication and ITRM performance and conducts qualitative research to reveal the associations. More specifically, this thesis addresses four aspects around the research topic: 1) How does effective communication improve the ITRM performance? 2) How do communication barriers impede the ITRM process? 3) Who are the communication stakeholders in ITRM? 4) What can be done to improve communication effects among these stakeholders in ITRM process?

Effective communication in ITRM can reduce unnecessary repeated work and shorten the time in information transferring. This enables the IT risk technicians respond to the IT risks in timely manners and keep IT risks under control. On the other hand, communication barriers exist in ITRM, like unfamiliar with terminologies, misuse of terminologies, language barriers, etc. All these barriers will add up additional workload in ITRM and therefore impede the whole ITRM performance. As ITRM and business operation are combined more and more closely, according to the research findings, almost all the members within the organization can be the communication stakeholders as long as their work interrelates with IT. Furthermore, this thesis proposes several recommendations for the organizations to improve the communication effects and reduce the communication barriers in ITRM.

5.1.1 IT risk trainings

According to the research findings, IT risk trainings are provided to the employees in the banking industry, which can be extended to other industries as well. IT risk trainings allow the employees to understand the importance of IT risk and keep their behaviours in compliance with the corporate risk policies. When the employees demonstrate ignorance and negligence towards ITRM, IT risk trainings can foster their ITRM awareness and reduce the communication barriers in the work.

Besides, IT risk trainings helps the ordinary employees identify the IT risks at an early stage and understand the current risk situation better. In this sense, it helps employees to describe and report IT risks clearly to the IT technician. According to

their initial description, the IT technicians can set up priorities to solve these risks in case the situation deteriorated.

Last but not least, through risk trainings, the ordinary employees and the IT technicians can build up close working relationship. During the training, they can communicate with each other in an open environment, which contributes to the reduction of communication barriers. Furthermore, as they might have established close working relationship, when the ordinary employee meet certain IT risk issues, they tend to be more proactive to reveal these IT risks to the IT risk technicians. This can nip IT risks in the bud.

5.1.2   IT risk culture

The organizations should develop IT risk culture. In the context of IT risk culture, all the stakeholders, regardless of the C-level management team, the IT technicians or the ordinary employees, are all exposed to the same values and knowledge about IT risk. In this sense, all the members can build up common sense and same perception towards ITRM.

An IT risk culture helps the employees to understand the importance of ITRM, and they are more aware of the outcome of successful ITRM. In addition, IT risk culture helps to improve the transparency and accountability in IT compliance and IT auditing, which in return contributes to mitigating the internal IT risks. Consequently, IT risk culture can break down the communication barriers and promote effective communication in the ITRM process.

Furthermore, IT risk culture also helps the company to develop an atmosphere of risk learning. Company will take every opportunity to improve their risk strategies and stay at frontier of ITRM.

5.1.3   IT risk communication

IT risk communication is a way to improve communication effects in ITRM process. It is suggested that various channels should be implemented in ITRM. IT risk communication includes various channels, like face-to-face meetings, remote meetings, telephone conversations, memos, emails, fax, etc. In this sense, people can disseminate information through multiple channels rather than relying on a single channel.

These channels enable timely information and knowledge sharing, and bring new ideas and thoughts into practice. This can ensure clearly information transfer as well. The IT technician can take advantage of each channel and utilize these channels to communicate with relevant stakeholders accordingly. For example, if the work is

simple and there is no need to take a face-to-face meeting, they can just arrange a remote meeting. On the other hand, these channels can be more useful in information gathering and collecting. From the management team to the IT risk technicians, they have more widely channels to receive information and they can make tactic responses to IT risks.

Therefore, there is reason to believe that multiple IT risk communication channels are beneficial to improve the communication effects during ITRM process, and further contributes to the performance of ITRM.

5.2   Research limitation:

This thesis reviews previous research achievements regarding communication and ITRM, and indicates that there is a lack of bridge between communication and ITRM. Therefore, this thesis conducts qualitative research to collect data through interviewing professionals in different industries. Further, this thesis well discusses the correlation between communication effects and ITRM performance. Although this thesis fills the research gap and provides concrete theoretical foundation for future research work, there remain some limitations due to limited time and efforts:

This thesis conducts interviews with five professionals. Although enough research data could be extracted from the interviews, however, it would be better if there could have been more interviewees with a wider range of industries. More interviewees will enrich the data and provide more information. It is beneficial to the analysis and discussion as well. The sample pool could have been larger, with more sufficient in-depth. In addition, the interviewee target is largely on the managerial positions that affect ITRM. What specific positions that influence ITRM significantly however can be interpreted differently in different corporations.

Secondly, this thesis takes interviews with professionals across four different industries. Indeed, this thesis reveals the communication effects of ITRM regardless of the industry type. ITRM is a fairly specialized job, and these findings are fairly general. It is worth further investigation that what are the relationship between the communication effects and successful ITRM in a given industry. Different industries have different features and properties, and therefore the research result might vary slightly in terms of industry type.

Thirdly, these interviews are mostly conducted via telephone due to remote distance between the interviewer and the interviewee. It could have been improved to take an on-site interview with interviewees since valuable information could be also extracted from the body postures, facial expressions, intonation, mood, etc.

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Last but not least, this thesis comes up with several recommendations to promote the communication effects in ITRM. These recommendations are based on previous academic research, practical investigation in the corporations, and the author's professional experience. However, despite these recommendations have been implemented in different organizations, they have not been well examined. Hence, further research could also study the feasibility and effectiveness of these recommendations once they are implemented.

References

Akintola S Akintoye & Malcolm J MacLeod. (1997). Risk Analysis and Management in Construction, *International Journal of Project Management*, Vol. 15, No. 1, pp. 31-38

Alan Arnold. (2010). Assessing the Financial Impact of Downtime, web blog post available at: http://www.it-director.com/business/costs/content.php?cid=12043 [Accessed 5 April 2015]

Bannerman, P 2008, 'Risk and risk management in software projects: a reassessment', *Journal Of Systems And Software*, 81, 12, pp. 2118-2133, Inspec, EBSCO*host*, viewed 2 May 2015.

Baracaldo, N, & Joshi, J 2013, 'An adaptive risk management and access control framework to mitigate insider threats', *Computers & Security*, 39, pp. 237-254, Inspec, EBSCO*host*, viewed 20 May 2015.

Berkeley (2015). Qualitative Research Methods For Information Systems And Management. Available at: http://www.ischool.berkeley.edu/courses/i272 [Accessed 5 April 2015]

Brikci, N., & Green, J. (2007). A guide to using qualitative research methodology [pdf] Available at: http://fieldresearch.msf.org/msf/bitstream/10144/84230/1/Qualitative%20researc h%20methodology.pdf [Accessed 13 April 2010].

Brousseau, P, & He´roux, D 2013, 'Factoring in success [structured risk management for IT innovation projects]', *CA Magazine*, 146, 6, pp. 34-36, Inspec, EBSCO*host*, viewed 20 May 2015.

Campbell, G.M. (2011), *The complete idiot' s guide to project management,* 5th ed, Alpha Books, Indianapolis, IN.

Campion, Michael A., David K. Palmer, and James E. Campion (1998). Structuring employment interviews to improve reliability, validity, and users' reactions. *Current Directions in Psychological Science* pp. 77-82.

Carcary, M 2013, 'IT Risk Management: A Capability Maturity Model Perspective', *Electronic Journal Of Information Systems Evaluation*, 16, 1, pp. 3-13, Inspec, EBSCO*host*, viewed 20 May 2015.

Church, Allan H., and Janine Waclawski (2007). *Designing and using organizational surveys: a seven-step process*. John Wiley & Sons

Cohen, E 2009, 'A Philosophy of Informing Science', *Informing Science*, 12, pp. 1-15, Inspec, EBSCO*host*, viewed 2 May 2015

Collecting & Analyzing Interview Data [pdf] (2015). Available at : http://yyy.rsmas.miami.edu/IAI/Inst2000/lectures/wood_jul20/reading/qual_appr _2.pdf

De Bakker, K, Boonstra, A, & Wortmann, H 2012, 'Risk managements' communicative effects influencing IT project success', *International Journal Of Project Management*, 30, 4, pp. 444-457, Inspec, EBSCO*host*, viewed 6 April 2015.

Habermas, J 1987, *The Theory Of Communicative Action*, n.p.: Boston : Beacon Press, Cop. 1987

Harner, M. M. (2010). Barriers to effective risk management. *Seton Hall L. Rev.*, *40*, 1323

Harrell, Margaret C., and Melissa A. Bradley (2009). *Data collection methods. Semi-structured interviews and focus groups*. Rand National Research Inst Santa Monica CA

Hwang, B, & Chen, M 2015, 'Sustainable risk management in the construction industry: lessons learned from the IT industry', *Technological & Economic Development Of Economy*, 21, 2, p. 216, Publisher Provided Full Text Searching File, EBSCO*host*, viewed 6 April 2015.

Ingham-Broomfield, R(2014, 'A nurses' guide to Quantitative Research', *Australian Journal Of Advanced Nursing*, 32, 2, pp. 32-38, CINAHL Complete, EBSCO*host*, viewed 21 May 2015.

ISO (2009). ISO 31000 - Risk management Available online: http://www.iso.org/iso/home/standards/iso31000.htm [Accessed 5 April 2015]

Kaplan, R. S., & Mikes, A. (2012). Managing Risks: A New Framework. *Harvard Business Journal*, 90(6), pp. 48-60.

Kenan Spaho (2013). Organizational Communication and Conflict Management [pdf] Available at: https://www.efst.hr/management/Vol18No1-2013/6-Spaho.pdf [Accessed 19 April 2015]

KPMG (2015). The Transformation of IT Risk Management [pdf] Available at: https://www.kpmg.com/US/en/IssuesAndInsights/ArticlesPublications/Documents/transformating-it-risk-management.pdf [Accessed 19 April 2015]

Laura K. Hahn, Lance Lippert, and Scott T. Paynton (2013). Survey of Communication Study: "Chapter 11 – Organizational Communication" [pdf] Available at: http://www.saylor.org/site/wp-content/uploads/2013/02/BUS209-6.1.1-OrganizationalCommunication.pdf [Accessed 19 April 2015]

March, J.G., Shapira, Z., 1987. Managerial perspectives on risk and risk taking. *Management Science* 33 (11), pp.1404–1418.

Mathers, Nigel, Nick Fox, and Amanda Hunn (1998). Trent focus for research and development in primary health care: Using interviews in a research project. *Sheffield: Trent Focus Group*

Otter, A. F., and Prins, M. (2002), Architectural design management within the digital design team. *Engineering, Construction and Architectural Management,* 9(3), pp.162-173

Pacelli, L. (2010), *The seven deadly sins of leadership*, Available from: <http://www.projectsmart.co.uk/the-seven-deadly-sins-of-leadership.html>, [Accessed 13 April 2010].

Reed, A, & Knight, L 2013, Exploring the Role of Communication Media in the Informing Science Model: An Information Technology Project Management Perspective, *Informing Science*, 16, pp. 131-145, Library, Information Science & Technology Abstracts with Full Text, EBSCO*host*, viewed 17 May 2015.

Regan Brown. (2015). The high cost of ignoring IT security, web blog post available at: https://powermore.dell.com/technology/the-high-cost-of-ignoring-it-security/ [Accessed 5 April 2015]

Rogers, Everett M., and D. Lawrence Kincaid (1981). Communication networks: Toward a new paradigm for research. Free Press.

Shoshanna Sofaer(1999). Qualitative methods: what are they and why use them? *Health services research* 34, No. 5 Pt 2: 1101.

Spremic, M, Luzar-Stiffler, V, Jarec, I, & Bekic, Z 2012, 'Corporate IT risk management model: a holistic view at managing information system security risks', Inspec, EBSCO*host*, viewed 5 May 2015.

Stake, RE 2010, *Qualitative Research. [Elektronisk Resurs] : Studying How Things Work*, n.p.: New York : Guilford Publications, Inc., 2010., Library catalogue (Lovisa), EBSCO*host*, viewed 3 May 2015.

Stoneburner, Gary, Alice Goguen, and Alexis Feringa (2002). Risk management guide for information technology systems. *Nist special publication* 800, No. 30, 800-30.

Stroie, E, & Rusu, A 2011, 'Security Risk Management - Approaches and Methodology', *Informatica Economica*, 15, 1, pp. 228-240, Business Source Complete, EBSCO*host*, viewed 1 May 2015.

The Royal Society (1992). Risk: Analysis, Perception and Management, Report of a Royal Society Study Group, The Royal Society.

Vlasta Svatá, and Martin Fleischmann. (2011). IS/IT Risk Management in Banking Industry. *Acta oeconomica pragensia* 19, No. 3, pp. 42-60

Westerman and Hunter (2013). IT Risks Turning Business Threats into Competitive Advantages [pdf] Available at: https://www.gartner.com/5_about/news/gartner_press/Westerman_intro.pdf [Accessed 19 April 2015]

Wheeler, E 2011, *Security Risk Management. [Elektronisk Resurs] : Building An Information Security Risk Management Program From The Ground Up*, n.p.: Burlington : Elsevier Science, 2011., Library catalogue (Lovisa), EBSCO*host*, viewed 6 April 2015.

Wiesche, M, Schermann, M, Krcmar, H, & Sprague, R 2013, 'When IT risk management produces more harm than good: the phenomenon of 'mock bureaucracy'', Inspec, EBSCO*host*, viewed 24 May 2015.

Zulch, B 2014, 'Leadership Communication in Project Management', *Procedia - Social And Behavioral Sciences*, 119, Selected papers from the 27th IPMA (International Project Management Association), World Congress, Dubrovnik, Croatia, 2013, pp. 172-181, ScienceDirect, EBSCO*host*, viewed 15 May 2015.

Appendix-Interview questions

Q1. Could you briefly introduce your work?

Q2. How do your work relate to IT risk management?

Q3. Does your organization promote an atmosphere of IT risk management?

Q4. How do you perceive communication effects in IT risk management?

Q5. Have you ever met any communication barriers in IT risk management?

Q6. Who do you think are the communication stakeholders in the ITRM process?

Q7. Could you see any improvements for current ITRM in terms of communication effects?