

# **The Moderating Effects of Organisational Culture on the Relationship between Knowledge Sharing and IT Risk Management Success**

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## **Abstract**

*The concept of IT risk management (IT-RM) success is an important topic in IS research due to high levels of uncertainty and threats, which negatively influence the performance of IT projects. In this paper we develop an IT-RM success model based on Hofstede et al.'s (1990) framework involving five dimensions of culture. Each cultural dimension is described in terms of how it relates to the concept of knowledge sharing (KS) among organisation members and the successful implementation of IT-RM. Our contribution is to illustrate the utility of Hofstede et al.'s (1990) framework by linking the five general cultural dimensions into an organisation's KS to propose a model of successful IT-RM implementation. Specifically, the aim of this study is to explore the roles of potential and realised KS cultures in IT-RM success. By doing so we present a necessary step in developing the concept of KS culture and moving towards a more comprehensive framework based on systemic empirical research.*

*Keywords: IT risk management, Knowledge Sharing, Organisational Culture, Conceptual Research/Study*

## **1 Introduction**

IT-RM is particularly important for organisations or business units insofar as it enhances and sustains their IT competitive advantage in the market (Wiesche et al., 2015). The goal of IT-RM is often to help organisations improve their performance, reduce IT risk, and increase efficiency. In this regard, many organisations have adopted comprehensive guidance and standards for designing IT-RM processes such as ISO 31000 (Purdy 2010), and COBIT5 (ITGI, 2008).

Organisations have increasingly adopted IT-RM practices; however, there are many difficulties involved in IT-RM implementation (Aven, 2016). Particularly, there are various and complex knowledge issues involved in effective IT-RM implementation (Rodriguez and Edwards, 2014). From a socio-technical perspective, the effective implementation of IT-RM is not only related to technical and procedural aspects, but also related to the roles and significance of an organisation's members and their knowledge needs (Karadsheh et al., 2008). For example, Lee et al., (2017) pointed out that when an organisation has an ineffective ability to learn from the past, individuals may repeat mistakes and rework their activities because of their inability to share acquired knowledge.

Despite the importance of an organisation's knowledge to achieve IT-RM success, there is limited academic research that develops this concept as a unit of analysis (Aven, 2016). However, we develop research focussing on an organisation's learning processes to address the lack of understanding about achieving IT-RM success. Specifically, we emphasise KS. This is motivated by the fact that KS has been identified to include effective learning processes to develop the ability to learn and transfer knowledge received from human sources to mitigate IT risk (Alhawari et al., 2012).

Nevertheless, in project-based organisations (PBOs), there are many difficulties in sharing knowledge among individuals due to the temporary nature of IT projects, time limitations and their structure (horizontal) (Wiewiora et al., 2013). Accordingly, this paper argues that insight into an organisation's KS is helpful in understanding how IT risk-related knowledge relates to IT-RM success.

Additionally, previous studies have demonstrated that organisational culture (OC) can be regarded as a contextual factor or as a social environment that affects the capturing and sharing of knowledge (Sanz-Valle et al., 2011). Some studies have pointed out that different characteristics of OC can have favourable or unfavourable impacts on organisational mechanisms for capturing, and sharing knowledge (Harrington and Guimaraes, 2005). However, the relationship between KS and IT-RM success is probably influenced by OC (Alhawari et al., 2012).

Additionally, existing research has greatly focused on culture at the national level which has left gaps at the organisational level for research investigating how an appropriate OC can facilitate successful IT governance mechanisms (Rowlands et al., 2014) such as IT-RM. Although the relationships between the three constructs (KS, OC and IT-RM) have been discussed and tested pairwise in previous studies, the three have rarely been simultaneously examined and validated. This research aims to understand how differing dimensions of culture can potentially influence an organisation's KS and IT-RM implementation.

In this study, we further investigate the cultural dimensions of Hofstede et al.'s (1990) model, because it offers an empirically measurable and well-validated means for operationalising culture through both quantitative and qualitative research approaches and has been cited frequently. The study contributes to the body of information systems knowledge by synthesizing data from the literature to develop a KS culture that facilitates IT-RM implementation initiatives. This research provides a theoretically grounded basis upon which future research about the role of KS culture in IT-RM success can be built.

The remainder of this paper is organised as follows. In Section 2, the relevant research on KS, IT-RM, and the cultural dimensions of Hofstede et al.'s (1990) model are reviewed, and a conceptual model is proposed. We propose a research design in Section 3 based on the literature. The last section provides a short overview of the next stage of the research.

## 2 Research Model

This study proposes a conceptual model and examines the relations among KS, OC, and IT-RM success, as shown in Figure 1. In the model, KS derives from available knowledge sources (explicit) and the experiences of an organisation's members (tacit) and influences IT-RM success. We adopt Hofstede et al.'s (1990) multi-dimensional definition of OC (results-oriented, tightly controlled, job-oriented, closed system, and professional-oriented cultures) and consider OC as a moderating factor in this model.

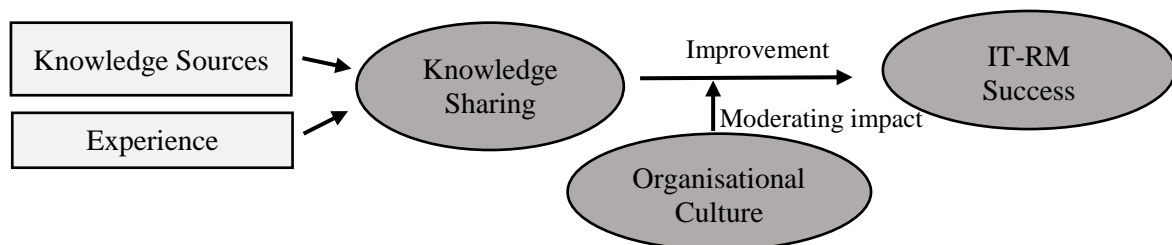


Figure 1. The Proposed Research Model

### 2.1 Knowledge Sharing

KS plays an important role in investigations of information science and systems, and has consequently attracted a lot of attention in the discipline of IS (Alhawari et al., 2012). According to Wiewiora et al. (2013), KS is defined as the ability to transfer framed experiences, information, and expert insight into documents, processes, and practices. KS assists organisations in gaining positive outcomes, such as intra-organisational knowledge transfers, inter-organisational learning, and IT/IS adoption (Wiewiora et al., 2013). It is also conceptualised that KS improves an organisation's ability to obtain and sustain organisational performance, innovation capability, and competitive advantage (e.g. Marouf, 2016).

PBOs, which often function in dynamic and changeable environments, to be highly competitive, and require to ensure the optimal utilisation of their organisational knowledge to identify and mitigate risks. IT projects have different levels of interdependency and function in different dimensions of time and space (Wiewiora et al., 2013). This characteristic leads to complications at an IT project level that relates to poor communication channels in PBOs, and to time pressures hindering KS among project team members. These characteristics all make the process of risk-related KS a challenging but important element of IT-RM success. There are a number of IT risk-related knowledge or information sources available during various phases of a project life cycle, which can be stored in databases, lessons-learned documents, and reports in the form of advice, of contextual facts, or in the mind of humans.

Prior research has recognised that the various properties of OC can have favourable or unfavourable impacts on an organisation's mechanisms for acquiring, and transferring knowledge to improve IT-RM (Rodriguez and Edwards, 2014). However, KS and OC can perform two separate but complementary roles in IT-RM success (Alhawari et al., 2012). Organisations cannot share and apply knowledge without an appropriate organisational environment. An appropriate OC can foster this kind of social environment in organisations, and this may encourage KS activities. In addition, balancing KS and OC is essential for PBOs to maximise organisational performance, which can provide a source of competitive advantage (Wiewiora et al., 2013).

From a socio-technical perspective, KS practices can be constructed technologically because employees can apply IT resources effectively as strategic enablers of formal KS practice initiatives to facilitate KS among employees. In contrast, KS practices can be related to the social environment such as OC in which they are embedded and are subject to various interpretations based upon the roles and responsibilities of different organisational groups and the desired human behaviours (Chang and Lin, 2015). In this research, the underlying theme is that different types of OC can lead to different types of KS behaviour and which of these behaviours, can lead to changing IT-RM outcomes (IT-RM success).

## **2.2 IT Risk Management Success**

IT-RM is a systemic procedure used to identify, assess, control and monitor risks that arise in terms of information systems or when using IT (Wiesche et al., 2015). IT-RM has been proven to facilitate and increase different benefits for organisations; for instance, it improves financial loss management, data security, and customer satisfaction (Wiesche et al., 2015). The effective implementation of IT-RM needs scheduling, resources, knowledge, and iterations (Rodriguez and Edwards, 2014). Much of the literature has provided guidance on and standards for the successful implementation of IT-RM in an organisation such as ISO 31000, and COBIT5. These approaches are intended to manage IT risks through providing formal guidelines and often have a particularly technical focus (Wiesche et al., 2015). Hence, these technological or procedural approaches to security are not adequate to control or mitigate IT risks and relate to only one side of IT-RM success (Aven, 2016).

Jahner and Krcmar (2005) noticed that effective IT-RM is achieved through two components: the soft behavioural component embodied in the organisational environment and culture, and the more concrete component embodied in the formal IT-RM program that guides the enterprise. Further, these authors pointed out that some organisations have now investigated socio-cultural aspects in the development of IS, after focusing predominantly on technical and procedural aspects in the 80s and 90s. This socio-cultural perspective is considered a useful tool through which to understand the roles and significance of stakeholders and their knowledge leading to a successful implementation of IT-RM.

Additionally, in the context of the effectiveness of IT-RM implementation, KS makes organisations flexibly and adaptively receptive to IT risk-related knowledge and facilitates managers' use of this knowledge in their processes, routines, and operations (Marouf, 2016). Although prior studies have provided clues for identifying critical success factors in IT-RM implementation, the literature still lacks enough evidence to show how the sharing of IT risk-related knowledge in an organisation can be increased.

## **2.3 Organisational Culture**

OC is made up of the beliefs, values, symbols, assumptions, ideologies, and myths of an organisation. Culture is basically the organisation's personality, which covers all areas of organisational life (Rowlands et al., 2014). Prior IT-RM literature has demonstrated that OC can contribute to IT-RM success (e.g. Darwish, 2015). OC serves as an "intervention" in IT-RM; it influences how employees think and act while doing the work of improvement (Alhawari et al., 2012). Muqadas et al., (2017) believed that success KS is achieved by building a supportive culture. Further, OC is an important factor in an organisation's ability to create value through leveraging knowledge assets (Muqadas et al., 2017). In this regard, IT-RM research cannot ignore the body of knowledge on OC.

In this study, Hofstede et al.'s (1990) cultural model is selected and investigated, because it offers an empirically measurable means for operationalising culture through both quantitative and qualitative research approaches. We refer to cultural characteristics in terms of their relevance to KS and IT-RM success. A learning organisation culture creates an environment in which the sharing of IT risk-related knowledge is not only viewed as a key responsibility of each employee, but it also supported by the interactions and encouragement of organisation members (Alavi et al., 2006). Therefore, we examine how Hofstede et al.'s (1990) cultural model affects KS in the context of IT-RM success.

The socio-technical view suggests that contextual factors affect the relation between KS and an outcome (Jahner and Krcmar, 2005). According to prior studies, OC can serve as a kind of contextual factor or social environment; its impact can encourage or impede KS among individuals (Zheng et al., 2010). In relation to IT-RM success, KS makes organisations open to flexibly identifying valuable IT risk-related knowledge in order to reconfigure and renew their knowledge bases.

According to Friesl et al., (2011) organisational structure has an effect on the processes of KS and consequently on IT-RM success. They found that various cultural properties affect KS across the organisation (horizontal) and throughout the different levels of an organisation (vertical). Wiewiora et al., (2013) noticed that within a PBO, various OC's may need various KS behaviours and implied that

identifying this requirement is an important step towards developing the theory, acknowledging that much research is still needed.

## 2.4 Hofstede et al.'s (1990) model of Organisational Culture

From 1990 to 2017, Hofstede et al.'s model has been cited nearly 4200 times in the social sciences and has been validated in more than 500 empirical studies making it the most frequently cited model with regard to analysis in the sciences (Minkov, 2017). One of the reasons for the frequent utilization of this cultural model is because it offers an empirically measurable and well-validated means for operationalising culture through both quantitative and qualitative research approaches. For example, one quantitative study on OC involved Hofstede's framework (Chang and Lin, 2015), which is based on a literature survey and focuses on the relationship between OC and knowledge management processes.

Hofstede et al.'s (1990) framework synthesised the generic dimensions of OC utilising current research on areas such as Competing Values (Cameron and Freeman, 1991), OC and Leadership (Schein, 1997), and OC Profiles (Klein et al., 1995). One of Hofstede's objectives was to present a framework upon which future theoretical and empirical research on OC could be conducted. This framework considers OC as a system of shared values, which focus on what is important and guide individual attitudes and behaviours. Table 1 summaries the five dimensions of OC according to Hofstede et al., (1990).

<p><b>1. Results- versus process-oriented culture</b></p> <p>In a result-oriented culture individuals tend to take risks and are comfortable in unfamiliar conditions and willing to be innovative and to face challenges (Hofstede et al., 1990). In contrast, in a process-oriented culture individuals tend to avoid risk and perform their work based on method and process and avoid innovative ways of solving problems. Hence, organic or flexible organisations are more results-oriented, whereas mechanistic or stable organisations are more process-oriented cultures (Ajmal and Koskinen, 2008).</p>
<p><b>2. Tightly controlled versus loosely controlled culture</b></p> <p>Tightly controlled organisations have tough written or unwritten codes of behaviour, while loosely controlled organisations have few unwritten or written policies (Shih and Huang, 2010). In loosely controlled cultures, there is informal and limited control of people, who are encouraged through motivation and respect for policies. In contrast, tightly controlled cultures emphasise accuracy and control people in a restraining and formal way (Ajmal and Koskinen, 2008).</p>
<p><b>3. Job-oriented versus employee-oriented culture</b></p> <p>This cultural dimension compares a concern for individuals (employee-oriented) with a concern for getting the job done (job-oriented). In employee-oriented cultures, the main decisions are often made by committees with remarkable concern for employee welfare (Woodman and Zade, 2011). In contrast, job-oriented cultures emphasise strong pressure for “over-performing tasks effectively” with insignificant concern for employee welfare (Eskerod and Skriver, 2007). Indeed, a job-oriented culture emphasises improving organisational performance, focusing on employee productivity and optimisation and ignoring employee feelings.</p>
<p><b>4. Closed system versus open system culture</b></p> <p>This cultural dimension measures the communication atmosphere within an organisation. In an open system culture, there is a focus on clear communication channels (Ajmal and Koskinen, 2008). Organisations with such cultures are open to outsiders and new employees due to encouragement of employee interaction. In contrast, closed culture organisations are generally mysterious and suspicious of outsiders as well as insiders. Thus, in this workplace, new employees need a significant amount of time to settle in (Hofstede et al., 1990).</p>
<p><b>5. Professional versus parochial culture</b></p> <p>This cultural dimension compares those entities whose individuals give their loyalty exclusively to the organisation (parochial) with entities in which employees remain greatly loyal to their profession (professional) (Chang and Lin, 2015). In parochial cultures, employees achieve their sense of identify from the organisation they work for whose social norms and values are similar to their own. In contrast, in professional cultures, employees gain their identity from the type of task that they are involved in. in such a culture, employees' values may not be compatible with those of the organisation for which they work (Chang and Lin, 2015).</p>

Table 1. The organisational culture framework (Hofstede et al., 1990)

## **2.5 Current Research on the Relationship between OC, KS and IT-RM Success**

Although the relationships between the three constructs (KS, OC and IT-RM) have been discussed and tested pairwise in previous studies, meaning only combinations' of two concepts have been investigated in the literature, all three have rarely been simultaneously examined and validated. For example, Alhawari et al., (2012) provided a conceptual framework, called KBRM that employs KS processes to improve RM and to increase the probability of success in innovative IT projects. Aven (2016) pointed out that researchers may wish to explore the effect of KS cultures on IT-RM, and Darwish (2015) noticed that given the relatively immature state of study on IT-RM, there is a requirement for explorative research. From our analysis of the literature, IT-RM would benefit from a KS culture, but the literature does not provide an understanding of how to improve IT-RM process through KS culture.

We use the five dimensions of culture included in Hofstede et al.'s (1990) theoretical framework to identify behaviours related to cultural values that underlie IT-RM implementation due to the informed theory about the way these cultural dimensions facilitate or impede IT-RM success. To apply Hofstede et al.'s (1990) cultural dimensions framework to our specific initiative, the first step of our approach was to scan the IT-RM literature to determine what dimensions have been used to define the culture of KS and IT-RM in an organisation. Thus, we examined the literature to identify the relevant dimensions of culture that potentially could facilitate KS among individuals.

The second step was to focus on interpreting the five dimensions proposed by Hofstede and to link them to both KS and IT-RM. For instance, we interpreted dimension #1 (results- versus process-oriented), as the extent to which organisations tend to be innovative and face challenges (organic and flexible) or to avoid innovative ways of solving problems (mechanistic or stable). To link dimension #1 to KS and IT-RM, this paper argues that sharing knowledge is not a formal process but one that is socially constructed, occurring over time through informal human networks in a results-oriented culture. Such a culture, with an innovative and motivational atmosphere might facilitate the creative identification and motivated assessments of IT risks.

We interpreted dimension #2 (tightly controlled versus loosely controlled) in terms of whether organisations have strict written or unwritten codes of behaviour, have few unwritten or written policies. To link dimension #2 to KS and IT-RM, it can be argued that loosely controlled culture with openness and high levels of individual autonomy will be more favourable to KS behaviours. A loosely controlled culture will result in high quality IT risk information due to higher levels of collaboration and participation among individuals.

We interpreted dimension #3 (job-oriented versus employee-oriented), as comparing a concern for individuals and their welfare with a concern for getting the job done, productivity, and optimisation. To link dimension #3 to KS and IT-RM, it is argued that a culture that emphasises trust and welfare will be able to share knowledge. In such a culture, the focus is on managing IT risks by providing informal guidelines and a social environment that ensures consensus and expertise for identification and mitigation of IT risks.

We interpreted dimension #4 (closed system versus open system) in terms of the communication atmosphere within an organisation. Organisations are open to outsiders and new employees, or are more mysterious and suspicious of outsiders as well as insiders. To link dimension #4 to KS and IT-RM, it is argued that much of the KS that occurs in organisations is tacit in nature and is best transferred through continuing openness, communication, and common language. Thus, cooperation, collaboration, and mutual understanding is essential for the KS which encourage the alignment between IT-RM and an organisation's strategies and objectives.

Likewise, we interpreted dimension #5 (professional versus parochial), as a comparison between those entities whose individuals provide their loyalty exclusively to the organisation and entities in which employees remain greatly loyal to their profession. To link dimension #5 to KS and IT-RM, it can be argued that employees share their knowledge voluntarily due to the benefits it creates for the organisation, thus, a parochial culture likely makes KS easier. A parochial culture that promotes using rewards and recognition systems to gain individual commitment will likely facilitate the identification and assessment process of IT risks.

The relationships between the five dimensions of Hofstede’s cultural model, KS and IT-RM are briefly presented in Table 2.

The third step, in order to validate the relationship between 5-dimentional framework, KS and IT-RM success, a qualitative methodology will be introduced. This methodology will help to understand and evaluate the relationship between the three constructs.

Organisational Culture (Hofstede et al., 1990)	The Relationship between the three Constructs (KS, OC and IT-RM)
1. Results- versus process-oriented culture	Prior studies found that much of the KS that occurs in organisations is tacit and is best transferred via informal environments such as results-oriented culture. Learning communities improve in a culture that supports KS and the establishment of a culture of sharing (Chang and Lin, 2015). A process-oriented culture can result in highly documented IT risks. It can influence the identification process in IT-RM. In contrast a result-oriented with an innovative and motivational atmosphere can facilitate in creative identification and motivated assessments of IT risks (Wiesche et al., 2015).
2. Tightly controlled versus loosely controlled culture	Much of the KS arises in informal environments as opposed to formal control systems such as those found in loosely controlled cultural organisations (Ajmal and Koskinen, 2008). Loosely controlled cultures with openness and high levels of individuals’ autonomy will be most favourable to KS behaviours (Jacks et al., 2012). Organisations can either focus on a tightly controlled culture, which ensures proper reporting, or a loosely controlled culture which results in high quality IT risk information due to high level of collaboration and participation among individuals (Alhawari et al., 2012).
3. Job-oriented versus employee-oriented culture	The lack of KS context, “personal ties” or “caring relationships” between employees has been associated with KS failure (Yuan et al., 2006). Thus, those cultures that emphasise trust, and welfare will be able to share knowledge. In contrast, in a job-oriented culture, with its focus on performance, and productivity, an atmosphere of competition with colleagues is fostered (Chang and Lin, 2015). Thus, the relationship among individuals is cold, and employees tend not to share their knowledge and experience with their colleagues. Organisations can choose between a job-oriented culture that focuses extensively on the bureaucracy and manage IT risks via providing a formal guideline an employee-oriented that ensures consensus and expertise for identification, and mitigation of IT risk.
4. Closed system versus open system culture	Much of the KS that occurs in organisations is tacit and is best transferred via continuing openness, communication, and common language such as open system cultural organisations (Jacks et al., 2012). In contrast, a closed system culture is distrustful of outsiders, permitting only inner circle interaction and being resistant to communication with others. Thus, cooperation, collaboration and mutual understanding is essential for alignment between IT-RM and organisation’s strategies and objectives (Wiesche et al., 2015).
5. Professional versus parochial culture	A parochial culture encourages the individual to share their knowledge smoothly as it is “good for the organisation” due to the fact that the organization identifies individual performance via reward systems and organizational interest in the comfort of the individual (Ajmal and Koskinen, 2008). In such a culture, employees share their knowledge voluntarily due to the benefit it derives for the organisation, however, this makes the KS more comfortable. In contrast, it can be hard to perform the same KS in professional cultures (Wasko and Faraj, 2005). Thus, parochial culture that promotes reward and recognition systems to gain individual commitments can facilitate the identification and assessment process of IT risks (Neef, 2005).

Table 2. A Proposed Framework of IT-RM Success

### 3 Research Design

This research proposes a two stage research design (see Figure 2). In Stage 1, we have identified from prior literature, a relationship between KS, OC and IT-RM success. We interpreted the five dimensions originally proposed by Hofstede et al., (1990) to link them to KS and cultural values underlying IT-RM as shown in Table 2. At this stage, it is argued that a KS culture is indeed needed and must be integrated effectively with IT-RM to ensure correct execution.

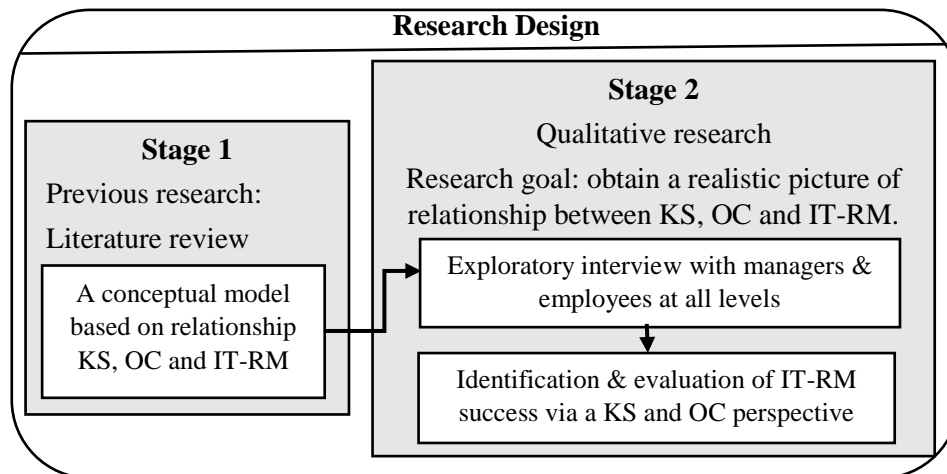


Figure 2: Overview of research design

In Stage 2, this research will employ a qualitative study within a social constructivist paradigm helping the researcher to interpret data from selected documents. The design will enable a combination of three case studies and the use of a variation of grounded theory as the data analysis methods.

In particular, the focus is theory building and an interpretive approach to a case study methodology gathering qualitative evidence. The paper argues that the required data needs to be qualitative, focussing on the decision process of the managers at key decision points. This decision perspective, it is argued, requires a shift in methodological focus from objective quantitative data to subjective recollections and qualitative descriptions. The qualitative tools to be used include, in-depth interviews, observational techniques, document collection, and personal experience. Data will be collected by conducting face-to-face interviews with stakeholders from different departments and organizational levels such as IT risk managers, IT department employees, and other managers. Furthermore, the paper recommends the need for theory building and the development and further testing of this theory to extend knowledge in the field. The design follows an exploratory research strategy by applying grounded theory techniques to analyse data (Charmaz, 2014). We suggest that the outcome of the experience of expert's input will significantly add to our understanding of the IT-RM success phenomenon.

### 4 Conclusion and Overview of Next Phase of Research

Recently, it has been widely argued in IS that organizations have increasingly been struggling with higher levels of uncertainty and threats, negatively influencing the performance of IT projects. This tendency has been accompanied by management research focused on how to manage IT risk. In this study, we propose to understand the relationship between OC, KS and IT-RM success. Our exploratory research will develop an IT-RM success model and address a lack of a theoretically-grounded research to steer empirical studies that can contribute to the domain of KS culture.

This research includes a two stage research design that was introduced in Figure 2. Stage 1 provided a conceptual IT-RM framework informed by the previous literature. In this stage, we interpreted how IT-RM could be supported by a KS culture within organisation. In Stage 2, a qualitative methodology will be introduced for evaluating the proposed conceptual model. At this stage, we will evaluate our IT-RM



success by multi-case analysis. We will then synthesise our findings through a cross-case analysis to illustrate how KS culture best facilitates IT-RM implementation.

The outcomes of this research are expected to benefit practitioners and researchers in PBOs through exploring an appropriate OC that can facilitate stakeholders sharing their knowledge from one IT project to another. Thus, stakeholders can identify IT risks, reduce their impact and achieve desirable results.

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