

Risk culture at senior and middle management level: a telecommunications case study

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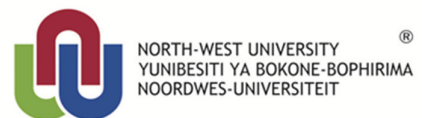
Mini-dissertation submitted in partial fulfilment of the requirements for the degree
Magister Commercii in Applied Risk Management at the Vaal Triangle Campus of the
North-West University

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It all starts here [™]



PREFACE

This mini-dissertation is the final deliverable in the Centre for Applied Risk Management (UARM)'s taught master's degree programme. The mini-dissertation was written in article format and consists of three sections: Research project overview, Article and Reflection.

This mini-dissertation is the student's work. The student was responsible for the final concept, set up, execution of the research project and writing of the mini-dissertation. The members of the supervisory team contributed in an advisory and technical support capacity on study conception and design, analysis and interpretation of data and critical revision of the manuscript. The mini-dissertation was language edited before submission.

The main study supervisor gave the student permission to submit this mini-dissertation for examination.

ABSTRACT

A mature risk culture is recognised as a key component of an effective risk management system. Such a system can support management in providing the required risk assurance to the board of a company, and ultimately assist the organisation in achieving its objectives. The aim of this study was to assess the maturity of risk culture at management level in a telecommunications company, with specific focus on exploring risk culture differences between senior and middle management. Risk culture maturity was assessed using the 2016 pilot version of the North-West University's Centre for Applied Risk Management (UARM) Risk Culture Questionnaire (UARM RCQ-2016). The results revealed high levels of risk maturity for both groups, indicating that each of them perceived risk management as an effective tool to assist the organisation in achieving its objectives. However, significant statistical differences were observed between the two management levels relating to risk integration and personal assessment of the understanding of risk in the organisation (risk understanding). This study addresses the perceived value to organisations of assessing their risk culture maturity by demonstrating the application of a newly developed questionnaire, and provides insight into the potential usefulness of comparing risk culture across management tiers.

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Thank you to my line manager and management team in the Risk Division for their support, assistance and patience during my studies. The team was always willing to listen, test and give feedback on many of my assignments during the last two years. Special gratitude goes to my line manager, who believed in me and my ability to successfully complete this degree.

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RESEARCH PROJECT OVERVIEW

1 Research problem statement

The telecommunications company selected for this study has an embedded risk management process supported by commitment and buy-in from its top management structures. Risk management is driven by top down and bottom up processes throughout the organisation, using management-level-specific approaches to identify, assess and report risks.

The risk culture in this organisation has not previously been measured, nor have areas for improvement been identified.

This study focused on the maturity of the organisation's risk culture rather than on the maturity of the risk management process. A risk culture survey was used to evaluate the risk culture maturity in this organisation's two top management levels with the aim of identifying any significant differences between them.

2 Expected contribution of this study

I could not find any studies published in the academic literature that examined differences of risk culture between management levels within the same organisation. The research project findings are expected to be relevant to academics in the field, the organisation's executives, the organisation's audit and risk committee, and managers and risk practitioners seeking to strengthen the risk culture in their organisations.

The present study also aimed to identify weaknesses and strengths in the targeted organisation's current risk culture. The results provided valuable input to the organisation's management about the current status of its risk culture maturity, thereby informing plans to strengthen the risk culture where needed.

3 Study forming part of a pilot project

This study formed part of a larger risk culture questionnaire pilot research project conducted by the Centre for Applied Risk Management (UARM) of the North-West University. A summary of the development of this research project is provided in Appendix C.

4 *Selected journal*

The ISI-listed *Journal of Risk Research* was chosen for potential publication of this article, because of its relevance in the field of risk management. The article was written according to this journal's guidelines with the exception of the referencing style, where I followed the APA 6th edition layout as prescribed for mini-dissertation purposes. The link to the journal's guidelines is:

<http://www.tandfonline.com/action/authorSubmission?journalCode=rjrr20&page=instructions#.V4u1stPqM8>

5 *Additional work done for this study*

Exploratory face-to-face semi-structured interviews with five middle and five senior managers, lasting between 30 and 45 minutes each, were conducted two months after the survey. The aim of the interviews was to obtain insight into the managers' views of the maturity of risk culture within the two top management levels, especially given differences identified from the survey results between the two management levels. Their views and comments on how the maturity could be strengthened were also obtained. The managers to be interviewed were selected using a purposive sampling approach, with certain managers deliberately targeted based on their active involvement in the risk management process, and others selected on the basis of availability. Data gathered from these interviews were thematically analysed as recommended by Braun and Clarke (2006). The findings of this qualitative study are discussed in the Reflection section of this mini-dissertation.

6 *Next steps and recommendations*

Organisation-specific next steps are discussed in the Reflection section of this mini-dissertation.

7 *References*

Braun, V., & Clarke, V. (2006). Using thematic analysis in psychology. *Qualitative Research in Psychology*, 3(2), 77-101. doi:10.1191/1478088706qp063oa

ARTICLE

Risk culture at senior and middle management level: a telecommunications case study

1 Abstract

A mature risk culture is recognised as a key component of an effective risk management system. Such a system can support management in providing the required risk assurance to the board of a company, and ultimately assist the organisation in achieving its objectives. The aim of this study was to assess the maturity of risk culture at management level in a telecommunications company, with specific focus on exploring risk culture differences between senior and middle management. Risk culture maturity was assessed using the 2016 pilot version of the North-West University's Centre for Applied Risk Management (UARM) Risk Culture Questionnaire (UARM RCQ-2016). The results revealed high levels of risk maturity for both groups, indicating that each of them perceived risk management as an effective tool to assist the organisation in achieving its objectives. However, significant statistical differences were observed between the two management levels relating to risk integration and personal assessment of the understanding of risk in the organisation (risk understanding). This study addresses the perceived value to organisations of assessing their risk culture maturity by demonstrating the application of a newly developed questionnaire, and provides insight into the potential usefulness of comparing risk culture across management tiers.

Keywords: *Organisational culture, risk management, risk culture, risk awareness, tone-at-the-top, communication*

2 Introduction

Boards have a fiduciary duty to act in the best interest of their organisations. To do this requires knowledge and an understanding of the type and magnitude of risks facing the organisation (GIA, 2016). An effective risk management system can support the management team in providing the required assurance to the board. Risk management culture, referred to in this article as risk culture, is a key element in developing such an effective risk management system (Boulton & Dominus, 2014). A high level of risk culture maturity in an organisation provides it with a means to manage risks more effectively, ultimately guiding the way in which management, employees and business units take risks.

Effective tone-at-the-top and risk communication have been highlighted as key elements required for a mature risk culture (Gandz & Seijts, 2013). Boulton and Dominus (2014) indicated that developing a mature risk culture requires continuous and sustainable commitment from the highest level in the organisation. Brodeur, Buehler, Patsalos-Fox, and Pergler (2010) emphasised the importance of proper communication across all organisational levels to ensure sufficient risk awareness to support a mature risk culture. Although many professional bodies have stated the importance of risk culture for an organisation as a whole, similar attention has not been given to differences in maturity of risk culture that can exist between different management levels of the same organisation.

In this survey-based quantitative case study, we aimed to evaluate the maturity of risk culture in a large South African telecommunications company at senior and middle management levels. The organisation is listed on the Johannesburg Stock Exchange and employs more than 8 000 people. Although the holding company operates throughout Africa, this study focused on the South African subsidiary. The core business of the company is telecommunications, but it is diversifying into other related communications business areas. This diversification process exposes it to new risks, which increases the importance of having a mature risk culture, especially in the two top levels of management. This study followed a quantitative research approach by using a questionnaire-based survey to establish risk culture maturity.

This study forms part of a larger risk culture questionnaire pilot research project that is being conducted by the Centre for Applied Risk Management (UARM) of the North-West University. A summary of the development of this research project is provided in Appendix C.

3 Background

The importance of aligning organisational culture with an organisation's risk management policy was included in the ISO31000 (2009) standard on risk management. Gebler (2006) viewed organisational culture as 'made up of the collective values of employees and managers that are reflected in their collective actions.' Risk culture concerns a more in-depth assessment of the organisational culture that focuses specifically on risk management (IRM, 2012). The strength of an organisation's risk culture can influence its ability to manage risk effectively, ultimately impacting on the risk taking behaviour of management, employees and business units (Ludwig, 2015). The article will now provide an overview of the interaction of organisational culture and risk management in order to better understand the key drivers of risk culture.

3.1 Organisational culture

Organisational culture has been actively researched. Insight into an organisation's culture can be achieved by examining the values, beliefs, knowledge and habits shared by members of the same society. Further insight into organisational culture is also achieved by examining the common purpose shared by a group, as demonstrated through their combined actions (Herbig & Dunphy, 1998; Schein, 1996). Hofstede, Hofstede, and Minkov (2010, p. 344) view organisational culture as 'the collective programming of the mind that distinguishes the members of one organisation from others'.

Organisational cultures are influenced by personnel in all levels within an organisation. Schein (2010, pp. 23-34) took a view of organisational culture by categorising it in three underlying levels. The first comprises the organisation's deep-rooted, implied assumptions that form the basis of the culture; the second, the values that the group would instil in an ideal world; and the third, the way the organisation wants to be portrayed externally. He also indicated that cultures can develop hierarchically within different levels of management because of shared assumptions at each level. These sub-cultural assumptions are transferred to newly appointed staff within these levels, resulting in potential communication problems. This situation creates the requirement for the same message to be presented differently, depending on the level within the organisation. Hofstede et al. (2010, pp. 341-380) further argued that organisational cultures are also made up of vertical relationships based on the shared values of superiors and subordinates, indicating that the leadership style of managers is driven by the dominant organisational culture.

Implementation of major initiatives within an organisation, including risk management, is also influenced by the entity's culture. Kimbrough and Compton (2009) found a positive correlation between the degree of progress in implementing risk management and the type of organisational culture. Barton and MacArthur (2015) indicated that cultural considerations can potentially prevent business from identifying and reporting significant risks in the risk management process, which in turn could negatively impact risk management's efficiency and success.

Few published academic studies have been conducted to determine the link between organisational culture and risk culture. However, the need for organisational and risk culture to be aligned was recommended by the Institute of Risk Management in the United Kingdom (IRM, 2012). It also noted that risk culture can influence the overall organisational culture.

An organisation therefore needs to understand its organisational culture and how its organisational culture can influence risk culture and risk management within that organisation.

3.2 Risk management

Risk management is an important responsibility of executive management, especially as it can assist an organisation to achieve its objectives. Beasley and Frigo (Fraser & Simkins, 2009, pp. 31-50) have pointed out that organisations in the United States experienced different types of crisis because they failed to manage the risks linked to their strategic objectives. Beasley, Clune, and Hermanson (2005) indicated that, owing to crises within organisations, more pressure is being placed on management to ensure that risk management is embedded into decision-making, allowing a more holistic and strategic view of risks.

Leadership, risk communication and a mature risk culture have been identified as three key success factors for an effective risk management programme. Beasley et al. (2005) viewed leadership by the board and senior management as key for such a programme. Shortreed (Fraser & Simkins, 2009, pp. 97-123) added helpful and constructive risk communication as a second key success factor that prompts timely identification of both opportunities and risks; and Brooks (Fraser & Simkins, 2009, pp. 87-95) identified a third key success factor as being a supportive and informed culture characterised by disciplined decision-making with consideration for associated risk and reward.

Few academic studies have been published on the impact of organisational culture on risk management. Fraser and Simkins (2009, pp. 390-402) surveyed risk management practitioners, of whom nine percent represented telecommunication companies. Their survey identified the need for further research on the impact of organisational culture within the field of risk management, particularly relating to implementation and practices. A study by Bromiley, McShane, Nair, and Rustambekov (2015) also pointed out that published academic research is limited, especially in the area of risk culture, risk appetite and the benefits of risk management.

3.3 Risk culture

There are many different descriptions of the meaning or understanding of risk culture. One of the more recent is that risk culture 'refers to the norms determining the collective ability to identify, understand, openly discuss and act on the organisation's current and future risks' (Dominus, 2015). The present study views risk culture in terms of how groups of people

integrate risk when making decisions on uncertain future events that could undermine an organisation's efforts to reach its objectives. A mature risk culture, for our purpose, is defined as a situation in which risk management is perceived as an integrated enabler for achieving the organisation's objectives by being fully integrated into the organisation's daily activities. A weak risk culture is defined as risk management that is not viewed as an integrated enabler for achieving the organisation's objectives.

A mature risk culture is a key element for an effective risk management programme. According to Gandz and Seijts (2013), a mature risk culture helps employees and stakeholders to understand the organisation's expectations with regard to risk management. Such a culture should assist decision-making in organisations (Vazquez, 2014), especially when management starts to demonstrate openness to discussing risk – most particularly in times of crisis, as noted by Shortreed (Fraser & Simkins, 2009, pp. 97-123). Boulthwood and Dominus (2014) found that a mature risk culture can help an organisation to achieve its strategic objectives while ensuring ethical and responsible risk-based decisions. They further reported that a mature risk culture can assist employees to better understand risk management through entrenching risk management into their roles and responsibilities. An immature risk culture, on the other hand, can prevent business growth (PWC, 2014). Ludwig (2015) and Walker, Shenkin, and Barton (2015) believed that, without a mature risk culture, the risk management process proves ineffective to the extent that the board may be unable to fulfil its oversight risk responsibility.

3.3.1 Leadership and tone-at-the-top

Risk culture is driven by an organisation's leadership through the tone that is set by senior management and filtered down to lower levels. Bozeman and Kingsley (1998) found that risk culture is formed through top manager perceptions of what is seen to be acceptable risk behaviour. Lower level employees learn from the actions taken by managers at higher levels, reinforcing the role of an appropriate tone-at-the-top as indicated by Teller (2013). Ludwig (2015) further emphasised that risk culture is mainly driven from the top down to lower levels within the organisation.

Buy-in and commitment to risk management by the organisation's leadership is one of the key success factors for achieving and maintaining a mature risk culture, and, as Boulthwood and Dominus (2014) concluded, continuous and sustainable involvement is required from the highest level in the organisation. Without commitment from the top, employees lower down in the organisation could assume that risk management is not taken seriously, which can result in inadequate risk-related reporting. By contrast, emphasising the need for a mature risk

culture championed by top management can encourage employees to be risk conscious, especially when taking business decisions (Barton & MacArthur, 2015; Fraser & Simkins, 2009, pp. 87-95; Hindson, 2010). The influence of top management on risk culture was also emphasised by Deloitte (2014), who suggested that any changes to risk culture should be driven from top management.

In addition to the importance of risk culture related messages from the top of the organisation, risk culture maturity is also influenced by the tone in the organisation's middle management. According to Protiviti (2012), an effective 'tone-in-the-middle' ensures that consistent risk messages are being transferred upwards or downwards. Companies are warned against assuming that tone-in-the-middle and tone-at-the-top are automatically aligned. The more management layers there are in an organisation, the greater the probability that the tones of the different layers may not be the same. Our study explored where such differences of risk culture maturity may exist within the senior and middle management levels of the selected organisation.

3.3.2 Risk communication

Consistent and regular risk communication from the leadership in an organisation is critical for a mature risk culture, as observed by Gandz and Seijts (2013). They found that communication must be applicable to staff members' current work environment, and that communication can succeed only when those receiving the message clearly understand its present and future implications for the company and for themselves. Timely and truthful risk communication is therefore regarded as a key principle forming the foundation of a mature risk culture (Deloitte, 2014; Fraser & Simkins, 2009, pp. 87-95; PWC, 2014).

The importance of examples set by management, as previously discussed, is also applicable for risk communication, as management's actual actions should be in line with what they communicate. Gandz and Seijts (2013) emphasised that leaders have to live the values they are communicating by 'walking the talk' to ensure the authenticity of their communication. Protiviti (2014) adds that communications received from the top are empty if not reflected in the actions performed by those communicating, and observes that too many layers of management in a company can result in excessive filtering of risk information from the top down (or vice versa), thereby preventing important risk messages reaching the desired audience.

Risk communication in an organisation will be effective only if such communication is relevant to the receiver and if the sender is seen as trustworthy. For Kasperon (2014), a key

purpose of communication in the risk management process is to ensure that only trusted and relevant information is sent to the appropriate employees and that it is sent in a timely manner. Boulton and Dominus (2014) explained that a mature risk culture creates an environment that encourages transparency, collaboration and clear communication of the values and objectives of the company as well as the risks associated with these objectives.

Appropriate risk communication across all levels of management is therefore important to create sufficient risk awareness to ultimately produce or support a mature risk culture, according to Brodeur et al. (2010). They further found that although top management may consider information that they communicate to be clear, this information may be unclear or misunderstood by lower level employees. Bozeman and Kingsley (1998) found that clear communication about purpose, goals and tasks can have a positive impact on an organisation's risk culture, and Kasperson (2014) pointed out that risk communication can be effective only if sustainable effort to communicate risk related information has been achieved within the risk management process.

In many organisations, risk communication is still work in progress. Although much advice has been published on risk communication, Kasperson (2014) believes that the basics of how risks are communicated in organisations have not fundamentally changed, and that there is also no proven effective method for communicating uncertain events to decision makers. Árvai (2014) adds that, although in theory risk communication has been defined in the literature, published studies do not reflect what actually occurs in practice. He pleads for greater interpretation of risk information before it is communicated, saying that 'for risk communication to be truly effective, it must become more decision-focused'.

3.3.3 Accountability and responsibility

The importance of assigning accountability and responsibility in the risk management process is well documented in many standards and guidelines (IoDSA, 2009; IRMSA, 2014; ISO31000, 2009). However, putting accountability and responsibility into practice has been the challenge for many organisations (Gerken, Hoffmann, Kremer, Stegemann, & Vigo, 2010). Banks (2012) believed that failing to delegate clear risk accountability and responsibility could contribute to an immature risk culture in an organisation. He emphasised that those organisations that have delegated clear responsibility for risks, and hold staff accountable for related risks decisions, reinforce and strengthen the organisation's risk culture. IRMSA (2014) indicated that a key to ensure accountability and responsibility for risk decisions is to include these responsibilities in employees' position descriptions, key performance indicators and even formal delegation of authority.

The importance for changes to risk culture to be driven from the top also applies to driving accountability and responsibility within an organisation. Banks (2012) indicated that clear accountability and responsibility need to be set and driven by top management. He further suggested that each level in the organisation should be empowered to make the required risk management decisions, and also to be held accountable for those decisions, especially during a risk event related failure.

3.3.4 Risk awareness

Risk awareness refers to the deeper understanding of risk management, assisting the organisation to understand the importance and benefits of the risk management process in aiding the achievement of its objectives. Banks (2012) emphasised the importance of risk awareness within an organisation, as an aid to achieving a mature risk culture, and ultimately to achieving the organisation's objectives. He further noted that to increase risk culture maturity, an organisation needs to ensure that risk awareness becomes actionable, thereby translating risk awareness into positive risk related actions and decisions by employees.

The development of a mature risk culture is seen as one of the building blocks for creating risk awareness within an organisation. CEB (2009) stressed the importance for an organisation to understand and regularly evaluate the maturity of risk culture to strengthen risk awareness. Banks (2012) supported this view by stating that the maturity of an organisation's risk culture is an indication of the strength of risk awareness in that organisation. He further emphasised that every employee should be risk-aware and understand the effects of the risk decisions taken by them, positive or negative. No studies were found in the academic literature focusing on how to strengthen risk awareness in organisations, or on how risk awareness can assist with the strengthening of risk culture.

3.4 Summary

In summary, scholars agree that a mature risk culture can assist an organisation to do the right thing rather than just 'doing what it takes' to achieve their goals. Top management should drive the process to ensure that a mature risk culture is achieved. The correct tone-at-the-top, clearly assigned responsibility and accountability, and effective risk communication are key drivers to assist top management in achieving a mature risk culture.

No published academic studies were found that explored possible differences between risk cultures at different management levels. The aim of our study was to compare the maturity of risk culture between senior and middle management within an organisation to gain insight

into any differences. Based on the limited research previously conducted, this study attempted to answer the following research questions:

- Does the risk culture differ between the top two (senior and middle management) levels in the organisation?
- What could be the reasons for statistically significant differences, should they be found?

4 Method

A survey-based quantitative research approach was used to assess the risk culture maturity at senior and middle management levels of the selected organisation. The pilot UARM RCQ-2016 risk culture survey developed by the Centre for Applied Risk Management at the University of the North-West was used for the present study. The risk culture survey items in this questionnaire are based on Hofstede et al. (2010) levels of culture, namely: symbols, heroes, rituals and values. The present study defines risk culture in terms of how groups of people integrate risk when making decisions on uncertain future events that could have a negative impact on reaching the organisation's objectives.

The main aim of the questionnaire was to assess how respondents viewed the levels of:

- Integration of risk management principles into the management of the organisation;
- The practice of risk management as an essential enabler for achieving the organisation's objectives.

The survey consisted of 34 items to assess two risk culture maturity factors. Factor 1 assessed the level of risk integration in the sample group (25 items) and Factor 2 provided diagnostic information on how individuals experienced their own risk-related roles (9 items). Factor 2 was split into two sub-factors: risk understanding (7 items) and individual responsibility and accountability (2 items).

The risk culture maturity score per factor was calculated taking a straight average of responses on the factor items. The scale uses a five-level Likert scale index with level five representing a mature risk culture, defined as risk management as a fully integrated enabler for achieving the organisation's objectives. At level one, risk management is not viewed as an integrated enabler for achieving the organisation's objectives. Descriptions for the five-level scale risk maturity index are given in Appendix C.

Every senior and middle manager in the South African subsidiary of the organisation was requested by email to complete the survey. An email containing the link to the online risk

culture survey was sent to a total of 314 employees (90 senior and 224 middle managers). The survey was open for 13 working days. Two follow-up emails to the sample group were sent as reminders to complete the survey.

The data from the survey, including demographic questions, were analysed using SAS®. Cronbach's alpha was calculated to determine the internal reliability of the questionnaire for the sample. Descriptive statistics were calculated for the biographic variables and item responses. The research questions: 'Does the risk culture differ between the top two (senior and middle management) levels in the organisation?' and 'What could be the reasons for statistically significant differences should they be found?' were explored using inferential statistics. The histogram for the items and factors was not bell-shaped as expected under normality. Since parametric assumptions of normality did not hold, a non-parametric test for differences between senior and middle management was used. The Wilcoxon scores were used to obtain the Wilcoxon rank sum (Mann-Whitney) test results for two independent groups. These results were used to test whether or not there was a difference between the risk culture maturity levels of senior and middle managers.

5 Results and Discussion

5.1 Results

5.1.1 Sample analysis

A total of 314 senior and middle managers were invited to complete the survey; 152 completed the survey fully, representing a response rate of 48.4%. According to Baruch and Holtom (2008) an acceptable response rate for surveys in organisations is 35.7%. The response rate for this study can therefore be regarded as acceptable.

Of a total of 90 senior managers, 38 (42% of senior managers) completed the survey and of a total of 224 middle managers, 114 (51% of middle managers) completed the survey. The response rates per management group adequately represented each group in the overall population (Table 1).

Table 1: Population and sample management level representation			
	Total <i>n</i>	Senior managers	Middle managers
Population	314	90	224
<i>Percentage of population</i>		29%	71%
Sample	152	38	114
<i>Percentage of sample</i>		25%	75%

Of these managers, 40% represented the commercial area of the business, 22% the operational area, and 38% the support functions. A total of 60% of the managers had been employed for more than five years in the company and only 7% for less than one year. Additional demographic statistics of the participants are provided in Appendix A.

The raw Cronbach's alpha for the scale was calculated, as the item variances showed a limited spread. The Cronbach's alpha score was 0.96, indicating high internal reliability of the survey for this sample in the organisation.

5.1.2 Risk culture factor scores

The factor based risk culture maturity scores were obtained by taking a straight average of item responses for the items belonging to each factor (Table 2). Refer to Appendix C for an explanation on the process followed to obtain the UARM RCQ-2016 factors.

Table 2: Risk culture maturity scores per factor per management level

	<u>Risk culture</u> <i>Risk integration</i> <i>Factor 1</i> (25 items)	<u>Risk culture diagnostics: Individual</u> Risk understanding <i>Sub-factor 2.1</i> (7 items)		Individual responsibility and accountability <i>Sub-factor 2.2</i> (2 items)
All participants	4.0	4.0		4.6
Senior Management	4.1	4.1		4.7
Middle Management	3.9	3.9		4.5

Descriptive statistics for the two management levels are provided in Table 3.

Table 3: Descriptive statistics of the factor scores for the two management levels

	<i>n</i>	Standard deviation	Mean	Median	Mode	Minimum	Maximum
<u>Factor 1</u>							
Senior Managers	33	0.6	4.1	4.2	4.3	2.6	4.9
Middle Managers	96	0.6	3.9	3.9	4.4	1.9	4.9
<u>Sub-factor 2.1</u>							
Senior Managers	37	0.7	4.1	4.3	3.9	1.7	4.9
Middle Managers	110	0.6	3.9	4.0	4.0	2.4	5.0
<u>Sub-factor 2.2</u>							
Senior Managers	37	0.8	4.7	5.0	5.0	1.0	5.0
Middle Managers	112	0.7	4.5	5.0	5.0	1.0	5.0

Note: The factor scores were calculated for participants who completed all items in each factor. This explains the differences in total number of respondents per factor.

The item responses were generally skewed to the right and the factor response distributions were therefore not normal. Since the parametric assumption for normality did not hold, a non-parametric test was used to test for differences in the factor means between the

management groups. The Wilcoxon scores were used to obtain the Wilcoxon rank sum (Mann-Whitney) test results and these results are provided in Table 4.

The results of the Wilcoxon rank sum test indicated that significant differences were observed for the risk culture maturity between senior and middle managers for Factor 1: Risk Integration and Sub-factor 2.1: Risk Understanding. For both factors the results indicated that senior managers' scores were significantly higher than those of middle managers.

Table 4: Wilcoxon rank sum test results

	Management level	<i>n</i>	Wilcoxon Mean Score	Difference (Senior Man* - Middle Man*)	Chi square test statistic	p-value	Significant difference at $\alpha=0.05$
Factor 1. Risk integration	Senior Middle	33 96	76.62 61.01	15.62	4.29	0.04	Yes
Sub-factor 2.1: Risk understanding**	Senior Middle	37 110	86.89 69.66	17.23	4.56	0.03	Yes
Sub-factor 2.2: Individual responsibility and accountability	Senior Middle	37 112	84.65 71.81	12.84	3.38	0.07	No

* Man = Management

** Risk culture area with biggest differences between management levels

The items where significant differences were observed between the two management levels are provided in Table 5. The full results per item are provided in Appendix B.

Table 5: Wilcoxon rank sum test between management levels per item

	Management level	n	Mean Wilcoxon Score	Chi square test statistic	p-value	Significant difference at α=0.05
<i>Factor 1: Risk Integration</i>						
RCQ 4	Senior	38	88.41	4.29	0.04	Yes
	Middle	114	72.53			
RCQ 6	Senior	37	87.42	5.35	0.02	Yes
	Middle	110	69.49			
RCQ 17	Senior	38	91.13	8.02	0.00	Yes
	Middle	112	70.20			
RCQ 19	Senior	38	86.62	4.27	0.04	Yes
	Middle	111	71.02			
RCQ 21	Senior	38	89.47	6.86	0.01	Yes
	Middle	111	70.05			
RCQ 24	Senior	35	86.94	5.71	0.02	Yes
	Middle	110	68.56			
RCQ 37	Senior	38	87.66	5.22	0.02	Yes
	Middle	111	70.67			
RCQ 39	Senior	38	84.67	4.47	0.03	Yes
	Middle	108	69.57			
<i>Sub-factor 2.1: Risk Understanding</i>						
RCQ 8	Senior	38	88.91	4.56	0.03	Yes
	Middle	114	72.36			
RCQ 34	Senior	38	88.61	5.98	0.01	Yes
	Middle	111	70.34			
RCQ 35	Senior	38	90.67	6.00	0.01	Yes
	Middle	114	71.78			

Note: The n values represent the number of participants who completed the item.

The results in Table 5 indicate that senior managers scored significantly higher than middle managers for the 11 items. The descriptions of these items are provided in Table 6.

Table 6: Description of items with significant differences between two management levels

Item number	Item
<i>Factor 1: Risk Integration</i>	
RCQ 4	I believe that risk management makes a positive contribution to achieving the organisation's objectives.
RCQ 6	I am able to challenge risk stakeholders on risk issues in the organisation.
RCQ 17	Executive managers practice what they preach on risk issues.
RCQ 19	My concerns about risks will be taken seriously by executive management.
RCQ 21	I trust the messages from management on risk-related issues.
RCQ 24	The organisation's management is accountable for events linked to risks connected to my role.
RCQ 37	I believe that my organisation reports risks in a honest and transparent manner.
RCQ 39	The organisation actively learns from risk events to improve the management of related risks.
<i>Sub-factor 2.1: Risk Understanding</i>	
RCQ 8	I understand the organisation's risk management framework (processes, practices, etc.).
RCQ 34	I know how well the organisation is performing in meeting our objectives.
RCQ 35	I understand the contribution that risk management as a practice makes in reaching the organisation's objectives.

5.1.3 Areas for improvement

The survey also explored the participants' suggested areas for improvement. The participants were requested to answer the following question:

To improve risk management in the organisation, I believe that we must start with improving risk (select only one of the options below)

- Communication
- Accountability and Responsibility
- Management processes
- Management systems
- Data
- Training
- Other (please specify).

A total of 50% of the middle managers and 40% of the senior managers indicated that the organisation should improve risk accountability and responsibility, with 37% of the middle managers and 18% of the senior managers suggesting risk communication (Figure 1).

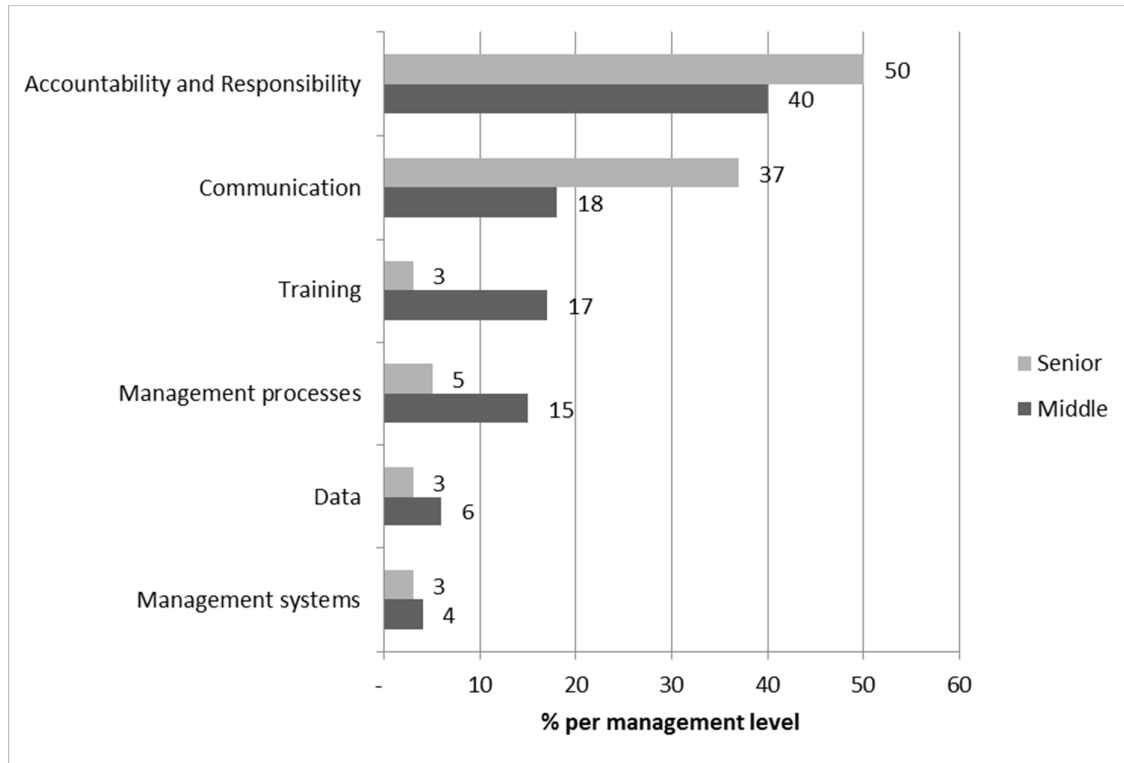


Figure 1: Management's view on where the organisation should start to improve risk management.

5.2 Discussion

The objective of this study was to assess the risk culture of the two top management groups in the selected organisation, using the UARM RCQ-2016, and then to compare them. The risk culture for both management groups was found to be at a high level of maturity, but the middle managers' scores were lower than those of senior management (Table 2). The research data revealed that senior management were more comfortable than middle management with the current level of risk management integration and the understanding of the risk management process in the organisation. These results are now discussed in further detail.

Statistical analysis of the results indicated significant differences between the two management levels for Factor 1: Risk Integration and for Sub-factor 2.1: Risk Understanding (Table 4) with senior management scoring significantly higher at the 5% probability level for both factors.

5.2.1 Factor 1: Risk Integration

For Factor 1: Risk Integration, eight items yielded significant differences between the two management tiers (Table 5). These items are all related to tone-at-the-top and the role that risk management plays in assisting the organisation to achieve its objectives. As described in

the background section, existing literature emphasises the key role that top management plays in creating a mature risk culture, and indicates that risk culture needs to be driven by organisational leadership through the tone that is set by senior management and filtered down to lower levels (Boulton & Dominus, 2014). The differences between the two groups in the present study indicates possible misalignment between the management levels, in that the required risk culture was perceived by senior management to be driven from the top, but in practice it was either not filtered down to the next level at all or it was not viewed in the same way by middle management. This finding underscores the importance of accurate and consistent risk communication between different levels, as emphasised by Kaspersen (2014), and this is an area needing careful attention if an organisation wants to achieve a mature risk culture. A total of 37% of senior managers indicated communication as a key area for improvement of risk culture (Figure 1), while only 18% of middle managers suggested communication as an improvement area. A total of 17% middle managers suggested training as an aid to improve risk culture, but only 3% of senior managers believed that this would assist.

5.2.2 Sub-factor 2.1: Risk Understanding

The second area of difference, Sub-factor 2.1: Risk Understanding – personal assessment of understanding of risk in the organisation, relates to employees' understanding of the risk management process and management's responsibilities in this process. Risk awareness within organisations is seen as an aid in the achievement of a mature risk culture, and ultimately assists the organisation in achieving its objectives, as emphasised by Banks (2012). The participants' results indicated less risk awareness among middle managers than among senior managers and therefore suggest uncertainty in middle management about their understanding of risk management.

The analysis of the items for Sub-factor 2.1: Risk Understanding identified three items for which there were significant differences between the two management groups. These items relate to the understanding of the risk management process and risk awareness in the individual's working environment, and how this understanding influences the achievement of the organisation's objectives. The results could indicate inadequate discussions on risk awareness, and risk more broadly, in middle management, especially relating to ways in which risks and risk decisions may influence the achievement of individuals' work related objectives. The literature indicates the important role that knowledge of the risk management process plays in ensuring integrated risk management (Banks, 2012), and additional processes may be needed to raise understanding and awareness of risk management at the lower of the two management levels in the present study.

5.2.3 Sub-factor 2.2: Individual Responsibility and Accountability

Analysis of the items in Sub-factor 2.2: Individual Responsibility and Accountability indicate that the individuals at the two levels of management were comfortable with their own understanding of their responsibility and accountability in the risk management process. However, with apparent inconsistency, both sets of participants also indicated responsibility and accountability as the area where they believed the organisation needed to start to improve in order to increase the effectiveness of its risk management process. The discrepancy could arise from a perception that others in the organisation do not reach the same standard of responsibility and accountability they as individuals do. The literature review emphasised the difficulty that organisations are experiencing in allocating risk responsibility (Gerken et al., 2010). This difference between one's own and others' responsibility and accountability in risk management in organisations opens potentially interesting areas for future research.

5.2.4 Overview of the results

My research indicates potential misalignment between the views held by senior and middle management on specific areas in risk management. The results offer valuable information for an organisation that needs to increase the maturity levels of its risk culture by targeting improvement where it is most needed. These initial findings also provide a baseline specific to this organisation for future assessments of risk culture maturity and for monitoring progress.

The present article documents the results of a study on possible differences in risk culture between different management levels in an organisation, using the pilot version of the UARM RCQ-2016 risk culture questionnaire. These results are a starting point for further investigation to determine the contributing factors for the differences noted, as well as to explore reasons for the potential misalignments revealed about the understanding of individual accountability and responsibilities in the risk management process.

The study was limited to the South African subsidiary of the selected organisation. Completion of the questionnaire was not mandatory, as the instrument was being tested as part of a larger pilot project, but the results show promise as a way to gain wider understanding of risk culture in the business. Future surveys in the organisation could therefore be made mandatory so as to increase the completion rate and provide more comprehensive results. The same survey could also be rolled out to other subsidiaries in this

organisation. The questionnaire was found to be suitable for this telecommunications company, indicating potential for wider applicability in other entities in this sector.

6 Conclusion

Prior work has documented the importance of risk culture, both to ensure an effective risk management process and to assist an organisation to achieve its objectives. A mature risk culture needs to be supported by a strong tone-at-the-top supported by the tone-in-the-middle, effective risk communication, and clear accountability and responsibility for the management of risks. In this study we determined and compared the risk culture maturity of senior and middle management through the use of a survey.

The results indicated differences between the risk culture maturity at senior and middle management levels in the organisation. These findings emphasise the need to determine how different management levels within an organisation influence the overall risk culture of such an organisation. The results further indicate a potential disconnect between the different management levels in certain activities within the risk management process. Senior management may believe that they are walking the talk on risk management, but if this is not translated into discernible action then middle management will not achieve the required results lower down in the organisation. A potential misalignment in the understanding of accountability and responsibility in the risk management process by middle managers was also highlighted. The organisation can use this information to develop strategies to mitigate these differences and increase risk culture maturity.

Most notably, this is the first study to our knowledge that has investigated differences between the risk culture maturity of senior and middle management. These results can provide motivation for other organisations to evaluate their own risk culture at different management levels, and to identify and target areas for its improvement. The telecommunications industry is constantly changing and rapidly diversifying. This type of risk culture study can provide the foundation for the same kind of initiative in other industries experiencing similar volatility and rates of change.

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REFLECTION

1. Overall reflection on this research project and studies

In this research project, I set out to evaluate and compare the risk culture maturity of two management levels in my organisation to establish potential differences between these tiers. The results showed interesting differences in risk culture maturity between senior and middle management. If appropriately applied, the insights emerging from the research should allow the organisation to implement remedial actions to reduce differences and to strengthen management's overall risk culture maturity. Consequently, my expectation is that the organisation would benefit from regularly evaluating its risk culture maturity.

Although successfully completed, this research project was not without challenges. It formed part of a larger pilot project, resulting in additional deadlines and changes being required, but being part of a larger pilot project was also beneficial as it allowed for more substantial and validated research. An additional benefit of being part of the pilot project was the additional learning that was achieved, which may not have occurred if this research project had been conducted in isolation. As always, time was also a challenge, particularly as the task at hand had to be done on top of everyday full-time work responsibilities. Thorough planning, organisational support and the management of deadlines, however, manifested in a successful research project.

The applied master's degree, moreover, provided an opportunity to devote in-depth focus to specific areas of the risk management process, which led to valuable insights. The collaborative efforts over the last two years with the lecturers and fellow students also stimulated an understanding of how others would potentially tackle similar concerns. A third positive of this study was that the research results have greatly benefitted the organisation that employs me through the sharing of newly acquired information and finding alternative solutions to current shortcomings in the risk management process.

Surprisingly, the greatest challenge I experienced was my lack of familiarity with the academic style of writing required for the assignments and the research project. In hindsight, perhaps a short course on academic writing and conducting research may have given me a considerable advantage. Ultimately, however, I consider myself better for it as I have acquired new skills and was able to complete the programme successfully, as well as the research project, despite any perceived limitations.

2. Additional work done for this research project

The research project overview included a description of interviews with managers. These interviews were conducted to gain additional insights into risk culture maturity, particularly given the differences noted between the two management levels, as well as to explore ways to strengthen maturity. This section is dedicated to the findings of the interviews conducted with selected managers.

2.1 Findings from the interviews

Five senior and five middle managers were interviewed and they provided insights into the discrepancies experienced between senior and middle managers on the topic of risk culture maturity. Most participants had anticipated these differences and even proposed that risk culture maturity should be higher for senior managers, given their duties and work environments. Basically, the idea expressed was that, as one's role in the organisation was elevated, so too would risk management exposure and focus. Certain middle managers did, however, express concern that risk decisions and discussions on higher levels did not always filter through to the lower levels.

The participants were also asked whether they believed that risk management had been integrated into the organisation. Although most replied that this was the case in the management tiers (strategic level), they agreed that more focus would be required on an operational level. A preference for proactive risk management emerged, along with a feeling that management should promote a wider viewpoint on risk rather than simply focusing on risk in their respective realms of responsibility.

Participants repeatedly indicated that fostering responsibility and accountability would go a long way to improving risk management in the organisation. When probed for views on the survey results, they backed the notion that accountability was an organisation specific 'cultural' problem. They felt that employees requested and were allotted accountability and responsibility for risk related decisions, but then struggled to accept the duties they had sought. In times of crisis therefore, employees might even be quick to denounce involvement in a specific risk decision. To overcome this problem, training and awareness of the risk management process would be necessary. In particular, participants stressed the importance of holding managers accountable for their risk decisions.

Finally, the participants added their suggestions on ways to improve the organisation's risk culture maturity:

- Provide additional risk training and education to help employees make risk management part of every action and decision;
- Focus on risk education, particularly in specialised risk areas affecting most managers, such as, for example, cyber and technology risks;
- Communicate strategic risks decisions and discuss these matters with lower levels;
- Create risk awareness by helping employees grasp the complexities of the risk management process and benefits of an effective risk management system.

The importance of risk management within an organisation was fittingly encapsulated by a senior manager who stated the following: 'Exposure to the risk management process within the organisation has changed the way I think about problems and situations in both my work and private life. It really helped me to better focus on these problems and to find solutions.'

2.2 Next steps and recommendations

The survey results will be presented to the organisation's management team with an emphasis on the role of 'tone-at-the-top' and 'walking the talk'. In addition, management's responsibilities and accountability in the risk management process will be discussed within the organisation as critical components. After all, top management's commitment to ensuring accountability for risk decisions is paramount and, as a result, risk communication should come from the top.

To ensure that recommendations are implemented, the organisation's risk management division is currently in discussions with the internal communications division to work on methods and media to present easily understandable risk information to the wider organisation. An internal risk management pamphlet and newsletter are also currently being developed. Finally, risk management training, based on the organisation's risk management framework, is to be rolled out, first to all middle managers at the beginning of 2017 and, thereafter, to all lower levels.

APPENDICES

Appendix A: Demographic statistics of participants

	<u>f</u>	<u>%</u>
<u>Age</u>		
30–39 years	35	23
40–49 years	85	56
50–59 years	31	20
60 or older	1	1
<u>Gender</u>		
Female	51	34
Male	101	66
<u>Nationality</u>		
South African	142	93
Other African country	9	6
European	4	2
United Kingdom	1	1
Other	1	1
<u>Education</u>		
High School	4	3
College	16	10
University Bachelors	35	23
University Postgraduate	96	63
Other	1	1
<u>English first language</u>		
Yes	97	64
No	55	36
<u>Area in company</u>		
Commercial	60	40
Operational	34	22
Support	58	38
<u>Management Level</u>		
Senior Management	38	25
Middle Management	114	75
<u>Time employed</u>		
Less than 1 year	10	7
Between 1 and 5 years	42	27
Between 5 and 10 years	30	20
More than 10 years	70	46

Appendix B: Differences between management levels per item

Item	Chisquare test statistic	p-value	Significant difference between Senior and Middle Man* at $\alpha=0.05$
<i>Factor 1: Risk Culture: Risk Integration</i>			
RCQ_1	0.96	0.33	
RCQ_2	1.06	0.30	
RCQ_4	4.29	0.04	**
RCQ_5	2.78	0.10	
RCQ_6	5.35	0.02	**
RCQ_9	1.29	0.26	
RCQ_10	3.04	0.08	
RCQ_12	1.39	0.24	
RCQ_13	1.26	0.26	
RCQ_15	2.63	0.10	
RCQ_16	2.94	0.09	
RCQ_17	8.02	0.00	**
RCQ_18	2.94	0.09	
RCQ_19	4.27	0.04	**
RCQ_20	3.51	0.06	
RCQ_21	6.86	0.01	**
RCQ_24	5.71	0.02	**
RCQ_25	0.41	0.52	
RCQ_27	0.39	0.53	
RCQ_29	2.60	0.11	
RCQ_31	0.34	0.56	
RCQ_36	1.77	0.18	
RCQ_37	5.22	0.02	**
RCQ_39	4.47	0.03	**
RCQ_40	0.03	0.85	
<i>Factor 2: Risk culture diagnostics: Individual</i>			
<i>Subfactor 2.1: Risk understanding</i>			
RCQ_6	5.35	0.02	**
RCQ_7	2.62	0.11	
RCQ_8	4.56	0.03	**
RCQ_9	1.29	0.26	
RCQ_11	0.16	0.69	
RCQ_26	1.15	0.28	
RCQ_32	0.39	0.53	
RCQ_34	5.98	0.01	**
RCQ_35	6.00	0.01	**
<i>Subfactor 2.2: Individual responsibility</i>			
RCQ_22	2.70	0.10	
RCQ_23	2.14	0.14	
*Man=Management			
**Yes			

Appendix C: UARM RCQ2106 questionnaire development summary

UARM Risk Culture Questionnaire Pilot

UARM RCQ-2016

Summary

September 2016

Hermien Zaaiman (Research project leader)

This document provides a brief overview of the 2016 pilot version of the UARM Risk Culture Questionnaire (UARM RCQ-2016).

1. Aim of UARM RCQ-2016

The aim of the UARM behavioural risk research programme is to develop tools to assess and improve the integration of formal risk management principles into organisational management. The aim of the UARM risk culture research project is to develop tools that can be used to assess the risk management culture ('risk culture') of organisations and identify possible problem areas related to risk culture.

We distinguish between risk management as a function in the organisation and the use of risk management principles during decision-making in the organisation. We expect that participating organisations will have a formal risk management function intended to facilitate and oversee the use of risk management principles at the organisation's strategic and operational management levels. As the specific implementation of risk management tends to differ from organisation to organisation, the UARM risk culture survey has been developed independently of how risk management is implemented in the organisation.

2. Terms

The term risk culture can have many meanings. This implies that risk culture must be carefully defined to allow for optimally reliable and valid assessment of the perceived risk management culture in an organisation. We took a value of risk management to the organisation based approach in the UARM Risk Culture research project. The terms necessary to understand our definition of risk culture are now defined.

Risk: For the purpose of this research project, we define risk as *the negative effect of uncertainty on objectives*. This definition links Hubbard's definitions of risk:

'Long definition: The probability and magnitude of a loss, disaster, or other undesirable event' or 'Shorter (equivalent) definition: Something bad could happen' Hubbard (2009, p. 8) to the ISO 31000 definition of risk as *'the effect of uncertainty on objectives'* (ISO, 2009b, p. 1).

Risk management: We use the ISO 31000 definition for risk management as *'coordinated activities to direct and control an organization with regards to risk'* (ISO, 2009b, p. 2). Hubbard (2009, p. 10) expands on this in his long definition of risk management: *'The identification, assessment and prioritization of risks followed by coordinated and economical application of resources to minimize, monitor, and control the probability and/or impact of unfortunate events'*.

Expected value of risk management to organisations: ISO 31000 recommends that *'organizations develop, implement and continuously improve a framework whose purpose is to integrate the process for managing risk into the organization's overall governance, strategy and planning, management, reporting processes, policies, values and culture'*. Such integration is expected proactively to increase the likelihood of achieving objectives by, in part, establishing a reliable basis for decision-making and planning. (ISO, 2009a, pp. v, vi)

Based on this ISO 31000 view of the value of risk management, we view the integration of risk management principles into organisational decision-making as an essential enabler for achieving the organisation's objectives. Taking risk into account during decision-making at all organisational levels and management processes should contribute to reaching the organisation's objectives.

Risk Culture: We used the Hofstede approach to culture as starting point for the development of the UARM Risk Culture Questionnaire (RCQ). Hofstede, Hofstede, and Minkov (2010, p. 516) define culture as the trained unwritten rules of the social game or the *'collective programming of the mind that distinguishes the members of one group or category of people from another'*. An organisation can be seen as a cultural group that consists of subgroups, each with their own subculture.

For this study, we define organisational risk culture as the way in which groups of people use risk management principles when making decisions on uncertain future events that could have a negative impact on reaching the organisation's objectives. This definition allows for an assessment of the expected value of integrated risk management to achieving the objectives of the organisation.

3. UARM RCQ development guidelines

The UARM risk culture questionnaire and items should:

- Be applicable across organisational sectors, work roles and risk types;
- Have a strong academic theoretical foundation;
- Be applicable in practice, i.e. with relevant and clear items, as briefly expressed as possible.

The RCQ items are based on key practices linked to the integration of risk management into the organisation's management at all levels of the organisation. The main aim of the questionnaire is therefore to assess how respondents view the levels of:

- Integration of risk management principles into the management of the organisation;
- The practice of risk management as an essential enabler for achieving the organisation's objectives.

The questionnaire also includes items that can be used as diagnostic indicators of where further questions should be asked about the risk culture of the organisation. The pilot version of the questionnaire (UARM RCQ-2016) was not intended to be a complete diagnostic tool. Based on the positive results from the questionnaire, we intend to further develop the risk culture diagnostic categories in the next versions of the questionnaire.

4. UARM RCQ items, factors and maturity levels

The pilot UARM RCQ-2016 online questionnaire consists of demographic, risk culture and diagnostic items. It took less than 15 minutes to complete for an initial test sample of respondents, with an average completion time of 10 minutes. This is brief enough to allow for adequately high response rates in the student research studies.

For ethical reasons, the questionnaire requires the participants to confirm that they are older than 18 years, have read the introductory information, and consent to participation on a voluntary basis before being allowed to continue with the questionnaire. Consent to participate is followed by standard and research-project-specific demographic items, such as age; gender; highest level of formal education completed; level in the organisation (e.g. board, executive, senior and middle management, non-management); function type (e.g. risk management, organisational management, operations); and length of time employed in the organisation.

Risk culture items

Forty risk culture items were devised during workshops with UARM students and research group members. The UARM student and research group members are all fully employed in

risk-related roles across industry sectors. This allowed relevant, practical input into the development of the items.

The student research-project data were used to conduct a detailed factor analysis of the responses to the UARM RCQ-2016 version of the UARM Risk Culture Questionnaire. One would expect factors related to risk culture to correlate with each other. Initial exploratory analyses on the individual student data sets supported this expectation by indicating that the factors were not orthogonal, but correlated. The final factor analysis was therefore performed using the principal axis factor method with promax rotation and listwise exclusion of responses with missing data, as advised by writers such as Fabrigar, Wegener, MacCallum, and Strahan (1999).

Two factors were identified involving 34 of the original 40 items. The 34 items showed consistent high internal reliability with Cronbach's alpha coefficients of between 0.95 and 0.96 for all seven student research projects. The second factor was divided into two sub-factors based on the results of further factor analyses. The factors were named using the contents of the items per factor and sub-factor:

Factor 1: Risk Integration (25 items)

Factor 2: Risk Culture Diagnostic: Individual (9 items)

2.1: Risk Understanding (7 items)

2.2: Individual Responsibility and Accountability (2 items)

The items in Factor 1 assess the participant's perception of the integration of risk management principles into decision-making with the aim of achieving the organisation's objectives. The items related to the contribution of the formal risk management function(s) to objectives driven decision-making are also included in this factor. These items will be further refined, based on the initial research results to create an even more reliable and valid UARM RCQ to be used for research in 2017 (UARM RCQ-2017).

The items in Factor 2 do not directly measure risk culture as defined for the purposes of this research project. The personal ('I') risk understanding and risk responsibility-accountability items divided into two sub-factors that can be used diagnostically to investigate further underlying aspects of risk culture. More diagnostic items will be developed in further research to allow for a more comprehensive diagnostic set of factors that can be used to evaluate the underlying reasons for participant perceptions of risk culture in organisations.

Calculation of factor score

At this stage in the development of the UARM RCQ, the factor scores per factor are calculated as the average of the means of the items making up the factor. This approach is generally recommended for new questionnaires where the factor loadings have not been confirmed (DiStefano, Zhu, & Mindrila, 2009; Russell, 2002).

The factor scores were calculated for each student's sample data using the items listed in Appendix UARM RCQ-2016 per factor. As the factor score values are calculated by averaging the self-reported perceived status of risk culture in the organisation, they cannot be seen as absolute measures of organisation's prevailing risk culture. The factors provide a summary of the participant's views of risk culture in the organisation. The possible influence of item response biases on the scores (e.g. directional, confirmatory, social desirability and acquiescence biases) should be investigated in further research studies to establish whether the items adequately assess risk culture levels.

We may expect that the organisations in which the student studies of risk culture were done have levels of high risk management maturity as they operate in well-regulated sectors and therefore expect high factor scores for the 2016 student studies. Studies in organisations with lower levels of risk management maturity will also have to be conducted to assess the validity of the questionnaire. Nonetheless, the perceived risk culture factor scores should permit preliminary conclusions about the perceived risk integration, individual understanding of risk and risk responsibility and accountability in the samples studied. Statistically significant differences between item responses of sample subgroups should also provide diagnostic information on risk culture differences between groups within organisations.

The UARM risk culture maturity model

The factors allowed us to define a risk culture maturity model. Maturity levels corresponding to the five level Likert-type answer scales for each factor are provided in Table 1. At this stage, the sample maturity levels may be used as initial indicators of participant perception of the risk management culture in the group studied.

Note: The maturity levels are used for interpreting the results of the questionnaire. This information does not appear in the questionnaire itself and is not seen by the research participants.

5. Conclusion

The 25 UARM RCQ-2016 risk culture items in Factor 1 show promise as a measure of perceived risk culture where the value of risk management is viewed specifically in terms of:

- Integration of risk management principles into the management of the organisation;
- The practice of risk management as an essential enabler for achieving the organisation's objectives.

Based on their nature, the items belonging to Factor 1 can also be seen to assess the perceived risk management tone of the organisation.

The Factor 2 diagnostic items can be used to provide limited additional information on two aspects that may influence risk culture in the organisation. The current items for Factor 2.1 measure the respondent's risk understanding. Factor 2.2 assesses personal responsibility and accountability for risks connected to the person's role. These items, combined with responses on the items in Factor 1 and the diagnostic items 41 (risk ownership) and 42 (what should improve) will be used as the basis for compiling a more comprehensive risk culture diagnostic questionnaire (i.e. what to ask the respondents to be able to diagnose the source of risk culture issues?). This question will be addressed in further UARM research projects.

Note:

The development of the questionnaire will be written up in detail as a separate article.

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Table 1. UARM Risk Culture Maturity Model (UARM RCQ-2016)

Factor	Factor Name	Risk Culture Maturity Levels				
Factor 1	Risk Integration	1.0 <= FS < 1.5 RM Not viewed as an integrated enabler of achieving the organisation's objectives	1.5 <= FS < 2.5 RM viewed as a low integrated enabler of achieving the organisation's objectives	2.5 <= FS < 3.5 RM viewed as a medium integrated enabler of achieving the organisation's objectives	3.5 <= FS < 4.5 RM viewed as a high integrated enabler of achieving the organisation's objectives	4.5 <= FS < 5.0 RM viewed as a fully integrated enabler of achieving the organisation's objectives
Factor 2	Risk Culture Diagnostic: Individual					
Sub-factor 2.1	Risk Understanding (Personal assessment of own understanding of risk in the organisation)	1.0 <= FS < 1.5 Do not understand risk in the organisation	1.5 <= FS < 2.5 Low level of understanding of risk in the organisation	2.5 <= FS < 3.5 Medium level of understanding of risk in the organisation	3.5 <= FS < 4.5 High level of understanding of risk in the organisation	4.5 <= FS < 5.0 Completely understand risk in the organisation
Sub-factor 2.2	Individual Responsibility and Accountability	1.0 <= FS < 1.5 Not at all responsible and accountable for risks connected to role	1.5 <= FS < 2.5 Low level of responsibility and accountability for risks connected to role	2.5 <= FS < 3.5 Medium level of responsibility and accountability for risks connected to role	3.5 <= FS < 4.5 High level of responsibility and accountability for risks connected to role	4.5 <= FS < 5.0 Completely responsible and accountable for risks connected to role

FS: Factor Score

6. References

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