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Organizational Resilience through Quality Management: A Study on the Impact of the Implementation of Quality Management Principles on Resourcefulness

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Declaration

I declare that this thesis has been composed entirely by myself and that it has not been submitted, in whole or in part, in any previous application for a degree. Except where stated otherwise by reference or acknowledgment, the work presented is entirely my own.

Mohammed Al Balushi

"Real knowledge is to know the extent of one's ignorance" Confucius (551-479 BC).

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This thesis sets a new boundary between two distinct phases of my personal and professional life, the past and the future. It is the past that enabled such a quest and it is the future that creates such excitement and enthusiasm. I should remain first grateful to God for all the blessings I have been granted.

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"*Praise be to Allah*". مُحَمَّدْ

Abstract

As Darwin noted, “it's not the strongest species that survive, nor the most intelligent, but the most responsive to change”. Organizations have long been investing heavily to ascertain a better future, in particular, they have embraced quality management systems in pursuit of their goals. However, change and adverse conditions necessitate not only quality and high performance, but also resilience. This research aims to investigate the relationship between quality management and organizational resilience. It examines the impact ISO 9001 implementation has on resourcefulness (the main component of resilience) in public organizations. It also examines how organizational structure affects the relationship between ISO 9001 implementation and resourcefulness.

Using semi-structured interviews, the research seeks to address the gap in the literature regarding the potential impact quality management initiatives have on resourcefulness. The study contributes to the body of knowledge by integrating and expanding the literature on resourcefulness. It will also provide empirical evidence on the proposed relationships. For more robustness, an insider-outsider approach is used for knowledgeable reflection on the findings by a senior and experienced member of the studied organization.

The findings show that ISO does positively impact resilience within the context of the research. However, the impact attenuates under routine-based environments, while it flourishes under process-orientation. The findings demonstrate that the organizational structure plays the most important role when it comes to organizational resilience, indirectly by facilitating the implementation of the quality management system and directly by enhancing resourcefulness; thus, resilience.

Lay summary

Just like people, organizations live through difficulties either natural (e.g. earthquakes and floods) or human-made (e.g. wars and terror attacks). Such events can have severe effects on the operations of both public and private institutions, including educational systems. For example, as a result of war in Syria and Yemen, access to education has deteriorated tremendously. Hence, the ability to overcome such events and regain operation is vital, which is the core subject of this study.

In this thesis, I examine how certain quality management principles affect organizations' ability to overcome difficulties. Similarly, I also inspect whether the work environment plays any role here. I interviewed 33 employees from the Oman Ministry of Education in the Ministry's headquarter in Muscat in an attempt to collect evidence on the two abovementioned questions. The interviews took place between November 2017 and May 2018.

The findings demonstrate that the implementation of the quality management principles enhance the ability to overcome difficulties (e.g. adverse weather conditions, financial difficulties, etc.). Added to that, the findings show that the nature of the work environment is instrumental to realise the aforementioned result. Environments that are marked by - among others - intensive communication, detection of change and rapid decision-making exhibit better capability to overcome difficulty.

Abbreviations

ASQ	American Society for Quality
BAB	British Assessment Bureau
COSO	Committee of Sponsoring Organizations of the Treadway Commission
CSF	Critical Success Factor
D	Department
DG	Directorate-General
ERM	Enterprise Risk Management
HRO	High Reliability Organization
IFAC	International Federation of Accountants
ISO	International Organization for Standardization
IT	Information Technology
MoE	Ministry of Education
NSF	National Science Foundation (USA)
PDO	Petroleum Development Oman
QAQDAS	Computer-Assisted Qualitative Data Analysis Software
RA	Risk Analysis
SME	Small and Medium Enterprises
TQM	Total Quality Management

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Chapter 1: Introduction

1.1 Background

According to Ancarani and Capaldo (2001), due to the lack of a competitive nature in the public sector, public institutions experience little pressure. In fact, compared to the private service sector, the public sector has a larger number of customers, say Virtanen and Stenvall (2014), often covering all citizens and residents in some cases. However, when facing adverse conditions (crisis and disasters), both the public and private sectors suffer equally. Over the past years, the Sultanate of Oman, as a result of changing global climate, has been affected severely turning the country into a regional hot spot for seasonal storms. These events have had a direct impact on the education system causing delays, and damage and loss of valuable equipment. Add to that, the recent decline in oil prices, the main source of income for the country (Al Mawali et al., 2016), has posed a huge challenge to the education system leading to enormous cuts in expenditure which in turn reduces both available resources and extent of operation. Events like the 2001 terrorist attack, 2008 financial crisis, and the Japanese earthquake and tsunami in 2011 (Coaffee, 2013; Chakravorty, 2015) require much more than just high-quality performance. They require resilience.

Helm (2015) suggests that the consequences of adverse events are getting more complex and unpredictable, spreading across borders in the interconnected world of today. Baddeley et al. (1990) suggest that situations are becoming harder to control due to technology and market pressure. This proposition matches Beck's (1992; 2006) view on risk in Risk Society: Towards A New Modernity. Beck emphasizes that as a result of modernization, new 'more destructive' global-level risks came to existence. He explains that risks did exist prior to modernity but on a 'personal' level. Considering the range of risks people have experienced before and after modernity, including volcanoes, earthquakes and wars, risk went beyond the personal level. It affected communities, groups of people and perhaps populations. According to Mythen and Walklate (2006), Beck suggests that

people used to encounter nature-produced risks, unlike the human caused risks of modernity. People are also responsible for mitigating these risks. Taleb (2012) shares a similar belief pointing that complex systems and technology increased unpredictability and adverse conditions. Likewise, Graham (1988) argues that the introduction of technological change affects organizations' operations and objectives. In other words, the introduction of new technology can disrupt the flow of work. Beck (1992) indicates that the high risk of a specific event may be overshadowed by the higher risk of another event. Again, complexity and risks have always surrounded people. Each age had its own problems and complex risks that people had to face. These could have caused the disappearance of entire populations at some points. As Perrow (1984) puts it, modernity has turned the world in to a more 'tightly-coupled' environment.

As a result of adverse conditions, organizations may decline, survive, bounce back or bounce forward (Australian Government, 2011). The ability of an organization to adapt to changes and difficulties and regain operation level is known as organizational resilience. According to Coaffee (2013), resilience is "the capacity to withstand and rebound from disruptive challenges". Vogus and Stucliffe (2007) define organizational resilience as "the maintainance of positive adjustment under challenging circumstances such that the organization emerges from those conditions strengthened and more resourceful". It is important to realize that resilience is mainly about regaining partial or full operation. Many researchers believe that increased uncertainty has substantiated the role of resilience (e.g. Mallak, 1998; Lengnick-Hall et al., 2011; Kantur and Iseri-Say, 2012; Mafabi et al., 2012; Winston, 2014). For Helm (2015), resilience is a characteristic that enables an organization to adapt to changes and difficulties. The literature introduces two types of resilience, namely, inherent and adaptive resilience. The first refers to capability under normal conditions, while the later refers to capability under abnormal/adverse conditions (Rose, 2004; Tinerney and Bruneau, 2007; Orchiston et al., 2015). Valikangas and Romme (2012) explain that organizational resilience has two dimensions: strategic and operational.

Strategic resilience refers to readiness to difficult conditions and operational resilience is about responding to such situations. Giordano (1997) suggest that resourcefulness, self-confidence, curiousness, self-discipline, sound judgement and flexibility relate to resilience. According to Pal et al. (2014), to enhance resilience, an organization has to nurture resourcefulness, competitiveness, and learning and cultural aspects.

In the business and management literature, a number of scholars have defined resourcefulness. According to Bruneau et al. (2003), resourcefulness is “the capacity to identify problems, establish priorities, and mobilize resources when conditions exist that threaten to disrupt some element, system, or other unit of analysis”. On the other hand, McCann and Selsky (2012) define it as “the creative assembly and use of individual, team, organization, and ecosystem capabilities and resources to act and react to events in the external environment”. Newsome (2014) introduces it as “the ability to adapt to crises, respond flexibly and – when possible – transform a negative impact into a positive”. There are three main assumptions regarding resourcefulness. First resourcefulness hints to the availability of required resources (Tierney and Bruneau, 2007). Second, self-organization makes the system more capable to respond to difficulties (Global Risks report, 2013). Finally, resourcefulness is considered the most important component of organizational resilience (Wicker et al., 2013).

1.2 Rationale, objectives and questions

Recently, organizational resilience has been of interest to both researchers and practitioners as the business environment witnesses growing uncertainty (e.g. Ponomarov, 2009; Goetsch and Davis, 2014; Kantur and Iseri-Say, 2015; Sahebjamnia et al., 2015; Hosseini et al., 2016). The concept as a whole has been subject to rigorous study world-wide, with Google Scholar presenting more than 13 million results for a search on organizational resilience. However, the components of the concept, in particular resourcefulness, have not had the same attention, especially in the context of operational risk. The concept of resilience has not also been sufficiently studied in organizational

settings in relation to other management systems, like quality management systems. Add to that, the organizational structure has not been necessarily accounted for in studies on organizational resilience. Finally, there is a lack of evidence on the relationship between quality management and resilience on one side, and the impact of process-orientation on this relation on the other.

The study has two main objectives: 1) identify the impact of the implementation of the ISO 9001 quality management system on resourcefulness and 2) investigate the effect of process-orientation on the relationship between quality management principles and resourcefulness. In its quest to realize the objectives, the research aimed at answering two main questions: 1) to what extent does the implementation of ISO 9001 Quality Management System affect Resourcefulness? And 2) how does process-orientation affect the relationship between ISO 9001 implementation and the level of resourcefulness? Beside these two main questions, the study seeks to find evidence on the following three questions: 1) is there evidence that self-organization generates better ability to respond to challenges within the context of this research?, 2) Is there evidence that entrepreneurial spirit develops capability for survival within the context of this research? And 3) is there evidence that mindful organizations are more open to change within the context of this research?

1.3 Significance of research

The research makes a number of contributions to the body of knowledge. It addresses the concept of resilience from a holistic view, not just in relation to scope within the environment but also in relation to other management systems and practices. It empirically investigates how resourcefulness behaves in a setting marked by the implementation of quality management systems, the ISO 9001 standard. This is a distinctive feature for this research as it goes beyond assessing first order (direct) effects. Moreover, the research contributes to the literature on strategic management and organizational structure by showing how organizational structures moderate the relationship between quality management principles, in this case ISO 9001 principles, and

resourcefulness. The research provides empirical evidence on how both routine- and process-based structures influence the impact of the standard on resourcefulness. By demonstrating the vital role of process-orientation in enhancing resilience, the research exhibits how high reliability can result from and coexist with auditing.

Add to that, the research makes additional contributions to the broader body of knowledge on management. It contributes to the literature on self-organization by empirically studying how the capability to self-organize impacts resourcefulness. It provides insight on how self-organization supports the system to overcome structural shortcomings during normal operation, whilst improving resilience during difficulties. Similarly, the study contributes to the literature in the field of entrepreneurship by focusing on the teleological nature of the concept, 'what entrepreneurial action leads to' (Mitchell et al., 2012), (Thornberry, 2006). The study investigates how entrepreneurial spirit contributes to resourcefulness and provides partial evidence in support of that. Also, the study contributes to the body of literature on mindfulness (e.g. Gartner, 2011) by empirically investigating the role it plays during normal and difficult times. Mindfulness supports transformation by creating openness to change, which in turn benefits the organization during normal and difficult times.

Other contributions include the choice of methodology and context. By devising an insider-outsider approach, the study introduces an uncommon perspective on the study of resilience. The presence of a local informer provides a more trusted and inclusive analysis that ensures balanced conclusions are drawn. The context of the research is another distinctive feature. Studying resilience in a public educational context is a unique contribution, especially, with the increased attention devoted to the topic by international organizations like UNESCO (Fredriksen, 2015) following many humanitarian crises around the world.

In addition to theoretical contributions, the study aims at making practical contributions. First, it may result in integrating resilience in both the strategic

planning and operation of quality management. As a result, the study may contribute to revising policy in relation to organizational structure, quality management and risk management. It also seeks to contribute to practice by helping managers understand how quality management initiatives affect organization's capability to encounter challenges. At the same time, this work aspires to help practitioners better understand resilience (resourcefulness) as a practice by introducing it as a set of processes and attributes.

1.4 Approach

The research used an inductive strategy to develop theory and deployed a qualitative approach for data collection. 32 semi-structured interviews were used in the main data collection phase. The choice was based on the fact that semi-structured interviews allow for clearer and more precise responses. Data collection started with a pilot study, which prompted minor changes. Then, the rest of the interviews followed. For more robustness, the research used an insider-outsider approach, where an expert from the organization was interviewed to reflect on the findings of the study.

1.5 Evaluation

The study yields three main findings. First, it shows that ISO 9001 implementation positively impacted resourcefulness by promoting process-orientation and standardizing basic risk management practices across the organization. Second, it reveals that the impact of the ISO 9001 standard diminished under routine-based environments, thrived under semi-process-based and process-based environments and faded again under highly process orientation. Context demonstrates that the organizational structure highly impacts both ISO 9001 implementation and resourcefulness by facilitating the implementation of the first and enhancing the latter. Finally, the study shows that in comparison to the effect of the ISO 9001 standard, the organizational structure has much more effect on resourcefulness, hence resilience.

1.6 Limitations

Throughout the research quest, limitations have been identified. First, sampling procedure is considered the main limitation. During the fieldwork, every department and sub-unit (section) in the studied Directorate-Generals (DGs) were invited to participate in the study. A total of 32 interviews were held; however, when considering stratification factors, a few departments were under-presented with only 2 people. Second, another issue was the methodology choice, which resulted in a representation issue. Females represented only one quarter of the total number of participants. This biased the representation of the sample. Third, longitudinal effects are considered another limitation as data collection coincided with the implementation of the latest version (ISO 9001:2015) of the standard. This was a great opportunity to understand how the latest version had impacted; however, time limitation made it difficult as implementation was at its early stage. Fourth, the scarcity of research on resilience in relation to quality management practices makes it difficult to relate the findings to extant literature. Hence, a follow-up study, perhaps quantitative in nature, might have been complementary to provide further empirical support.

1.7 Definitions of Terms

To ensure no confusion is caused due to used terminologies, the following definitions are guidelines on the main concepts used throughout the study.

Quality Management System (QMS)

“A formalized system that documents processes, procedures, and responsibilities for achieving quality policies and objectives”, (ASQ, 2019).

ISO 9001

“…The most recognized and implemented quality management system standard in the world”; it “specifies the requirements for a QMS that organizations can use to develop their own programs”, (ASQ, 2019).

Organizational Resilience

“The maintenance of positive adjustment under challenging circumstances such that the organization emerges from those conditions strengthened and more resourceful”, (Vogus and Sutcliffe, 2007).

Resourcefulness

“The capacity to identify problems, establish priorities, and mobilize resources when conditions exist that threaten to disrupt some element, system, or other unit of analysis”, (Bruneau et al., 2003).

Sensemaking

“A process, prompted by violated expectations, that involves attending to and bracketing cues in the environment, creating intersubjective meaning through cycles of interpretation and action, and thereby enacting a more ordered environment from which further cues can be drawn”, (Maitlis and Christianson, 2014).

Self-organization

“The mechanism or the process enabling a system to change its organization without explicit external command during its execution time”, (Di Marzo Serugendo et al., 2005).

Entrepreneurial spirit

“The process by which individuals inside organizations pursue opportunities independent of the resources they currently control; this involves doing new things and departing from the customary to pursue opportunities”, (Hisrich and Kearney, 2012).

Mindfulness

“Enhanced attention to and awareness of current experience or present reality”, (Brown and Ryan, 2003).

1.8 Thesis structure

This chapter introduces the research work covering: the general topic, background, rationale, objectives and questions, significance of research, approach, evaluation, limitations, definitions of terms, and thesis structure. The rest of the study goes as shown below.

Chapter 2: Literature Review

This chapter reviews the relevant literature, identifies gaps and sets the basis for the theoretical foundation of the research argument. It also covers the development of the concepts of risk and risk management, and the main constructs referred to during the discussion.

Chapter 3: Methodology

This chapter introduces the philosophical underpinnings of the research, choice of strategy, approach and tool, and procedures related to data collection. It also previews analysis and addresses research robustness.

Chapter 4: Analysis and Results

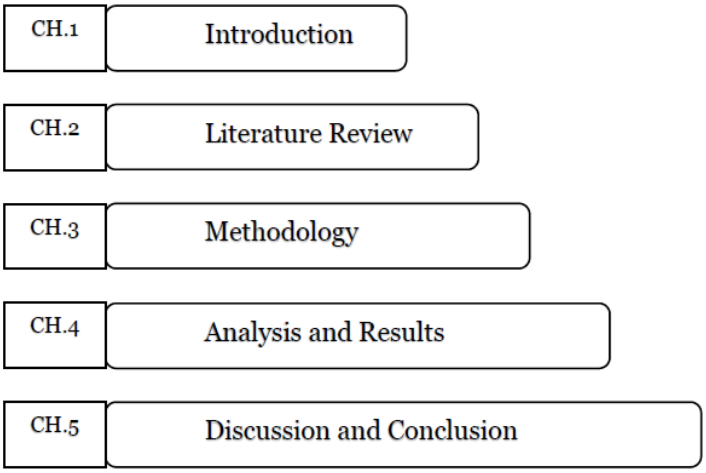
This chapter introduces participants' profiles, analyses interview inputs and presents results. It also presents the inputs from the insider expert to further assess the analysis process.

Chapter 5: Discussion and Conclusion

This chapter summarizes the research, discusses the findings and proposes directions for future research. The discussion covers research contributions, implications and limitations. It ends with researcher's concluding remarks.

Figure 1.1 (next page) previews thesis structure.

Figure 1.1: Thesis structure.



Source: Author.

Chapter 2: Literature Review

2.1 Chapter Overview:

This chapter reviews the theory of the three fields, namely, resourcefulness, ISO 9001 system and organizational structure. However, to better understand the connection between resourcefulness, organizational resilience and risk management at its broadest sense, the chapter starts from the basic constructs of risk management and builds on. The review concludes with the introduction of a conceptual framework that sets the ground for the research. The chapter is structured as follows: section 2.2 presents a synopsis on the conception of risk. It detects the evolution of the concept over time. Sections 2.3 and 2.4 revisit the theory of risk management highlighting its evolution. Section 2.5 inspects the literature of organizational resilience, examining the conceptual and practical aspects of the concept. Section 2.6 examines resourcefulness in terms of conception, processes, attributes and practice. Section 2.7 discusses quality management in general and ISO 9001 in particular. Section 2.8 addresses organizational structure, its implementation and effects. Finally, section 2.9 summarizes the discussion and introduces a conceptual framework to guide the study.

2.2 Risk

According to Aven and Renn (2010), risk is a ‘basic constituent’ in the lives of people. Berg (2010) adds that risk is inevitable in all aspects of life for humans and organizations of all types. It is part of every human or organizational interaction. Aven and Renn (2010) explain that risks can be due to natural events or human-related causes such as wars. Mitroff and Alpaslan (2003) name three types of risks/uncertainties: natural disasters (e.g. floods), malicious actions (e.g. terrorism) and human-related failures (e.g. unsound performance by people or technology). Aven and Renn (2010) state that the literature presents various definitions for risk, yet no single definition has been agreed upon. The various definitions express risk either as an expected value and probability of events, consequences and uncertainty. The International

Risk Governance Council (IRGC) (2005) defines risk as “an uncertain consequence of an event or an activity with respect to something that humans value”. In relation to an event, Barwise (2014) refers to risk as “a measure of its probable consequence”. Simply, it can be described as an opportunity or condition favourable to an end.

Beneplanc and Rochet (2011) report that risk-taking has always accompanied humans throughout their lives. Hunting for food, fighting for new lands or resources, and immigrating in pursuit of safer conditions are examples of risky behaviours people undertook mainly for survival. Adams (2002), believes that every person is a “freelance risk manager” where at the individual level simple reasoning is the main method to deal with risk. For instance, an ordinary daily walk or navigation from a place to another involves several risk assessments and decision-making. Brown (2012) says that in general people use two strategies when dealing with risk. They tend to avoid it when possible, especially, if it is not worth taking. Alternatively, they take risky opportunities that provide chances of positive outcomes. So, reasoning in the context of risk can be thought of as balancing benefit (reward) and damage (loss). Wharton and Ansell (1992) indicate that one of the possible roots for the term risk might be the Arabic word ‘risq’ (livelihood or fortune). It is notable to mention that in the Arabic literature, risk had two different conceptions referring to the pre- and post-Islamic eras. In the pre-Islam era, risk connotated with good and bad fortune. Zaqzouq (2017) shows that in the post-Islamic era, risk has been connotated with opportunities and threats in a religious context. Indeed, this meaning has been integrated in daily life.

Al Saadi (2012) demonstrates that as early as 4000 B.C., the Sumerians of Iraq referred to Oman as ‘Maghan’ or the country of ships. This reflects early travel and trade across the Arabian Gulf. According to Dr. Mohamed Redha Bhacker (2013), Editor-In-Chief, Journal of Oman Studies, “archeological evidence from Oman and the Arabian Gulf suggests that the region is not only one of the oldest continuously inhabited places in the world, but also provides the earliest evidence of boat building and long-distance seafaring, dated to as

early as the sixth millennium BC". He explains that this evidence indicates ship building in the third millennium B.C. context, beside deep-water fishing. Dr. Bhacker shows that by 2350 B.C. Omani traders sailed between Oman and Mesopotamia crossing the Arabian Gulf and the Gulf of Oman. This indicates risk taking in pursuit of profit in very early stages. Similarly, Tchang Zu Yan indicates that Arab-Chinese maritime trade existed 1500 years ago during the Han dynasty (Atheer, 2014). Yan shows that the Omani city of Suhar, used to be known as the 'gateway to China' for its maritime trade with Chinese ports then.

Beneplanc and Rochet (2011) show that the idea of risk-taking in economic and business activities has been around for a long time. Merchants financed voyages on wooden ships that sailed through seas full of dangers (e.g. pirates and storms). The sailors themselves posed a threat on both the investment and valuable goods to be brought in return. Haight (1986) says that normally risk and accident are closely related in the different contexts. However, accidents are always avoided, while risks might be sought in some cases (e.g. gambling and insurance). According to Lupton (2013), prior to modernity, risk was associated with natural events that people could hardly do anything about. Humans would try to estimate the occurrence of such events and strive to reduce their effect. This might be why the 'rain man' had historically been a major figure in several civilizations. However, human-related risks have been present in the pre-modernity era. For example, people had known crime, wars and tyranny. Schneider (1976), explains that serious attempts were taken in Italy in the late 15th and 16th centuries to utilize probability in Games. This came as a result of the growth in games and commerce. This led to an increase in gambling activity. However, because of the opposition from the church, the efforts were interrupted at the time. Better circumstances later in the 17th century in France established grounds for the theory of probability, in particular, for gambling. Debnath and Basu (2015) state that Pierre-Simon Laplace's treatise (Analytical Theory of Probability) was the basis of insurance statistics in the same century.

Skinns and Scott (2011) reveal that in the 17th century, the concept of risk began to be associated with industrialization. The knowledge of statistics and probability of the 18th and 19th centuries became key for risk management later. Since the 18th century, risk has been considered an important aspect of decision-making by economists. Knight (1921) is known for differentiating between risk and uncertainty as measurable and unmeasurable probability. He believes probability deals with both risk and uncertainty. He simply proposes that risk can be modelled, while uncertainty cannot. According to Dizikes (2010) and Cowan (2016), the concept is very important in Knight's theory. It explains that risk can be measured, therefore, insured. It also indicates that profit can be made from uncertainty through 'quality' investments as explained by MIT's Chair of Department of Economics, Professor Ricardo Caballero (Cowan, 2016). Lupton (2013) demonstrates that uncertainty was used to refer to events that probability cannot provide estimates of the likelihood of their occurrence.

In the post modernity era, risk is dealt with in a mere technical manner, where events are predictable through probability. However, Haight (1986) argues that the word risk as a probability can sound inappropriate in many contexts; for example, when tossing a coin in a game. This sounds more like a connotational issue. Sedgwick (2012) says that risk can be associated with good or bad outcomes. For example, risk in the share market means either loss or benefit. He elaborates that though risk is seen as two-sided, its conceived sides (win and loss) are one-sided each. Although risk connotes with harm or negativism, or experiencing danger, it refers to probability in statistical context. It might not be an indication to undesirable consequences however. In a hospital, a diagnosis might indicate a chronic disease or pregnancy. The first would be regarded a negative event while the second is most probably not. Beneplanc and Rochet (2011) say that risks are also associated with entrepreneurship where they form the very core of an entrepreneurial spirit. However, in the context of entrepreneurship, it is more about positive opportunities, which definitely entail degrees of risk. Lupton (2013) highlights that from the 20th century, risk has only been linked to

negative outcomes. It simply refers to ‘danger’ and indicates both predictable and unpredictable events.

In terms of its impact, the Royal Society (1992) cites Green and Brown’s distinction between individual and societal risks. They explain that an individual suffering from a snake bite differs from a societal level exposure to nuclear radiation. The Royal Society shows that this distinction has direct implications on risk management. Haight (1986) reports that since estimation varies based on available information, the concepts of objective and subjective risks were introduced. Objective risk is considered by specialists (experts), while subjective risk is experienced by those who go through it (users). This classification may result in a new risk, difference (gap) between objective and subjective estimation. For example, road engineers represent the objective risk perspective, while road users represent the subjective perspective. Still, subjectivity remains a major element even among experts. The Royal Society Report (1992) indicates that risk is both personal and frequential. The report mentions three risks introduced by Slovic et al. in 1980 following a factor analysis. The study revealed that dread risk, unknown risk and number of exposed people are the main factors in risk conception. Dread risk refers to ‘judgement of scale’, while unknown risk refers to ‘judgement of observability. Dread risks include, inter alia, crime and weapons of mass destruction, whereas unknown risks include, inter alia, DNA and technology research. The factor analysis used to establish a perception for risk was ‘Bayesian’ where degrees of belief were used as probabilities (Renn and Walker, 2008). Lupton (2013) demonstrates that seven groups of risks create most of the concerns among people and organizations: 1) environmental, 2) lifestyle, 3) medical, 4) interpersonal, 5) economic, 6) criminal and 7) political risks. In this thesis, risk is used to refer to both danger and uncertainty.

Though the review has introduced risk broadly, the case in Chapter 4 addresses operational risk within the context. Operational risk in the context refers to events that obstruct continuity of operation such as: weather condition, equipment failure and absence/performance of employees.

2.3 Risk Management

Sutton (2015) says that risk management is an important aspect of excellence and integrity at organizational levels. Renn and Walker (2008) state that risk management refers to “the creation and evaluation of options for initiating or changing human activities or (natural and artificial) structures with the objective being to increase the net benefit to human society and prevent harm to humans and what they value”. The process is scientific, systematic, very sophisticated and knowledge-based; however, it still involves subjectivity. Pym (2015) indicates that risk management is concerned with information collection and decision-making. Beneplanc and Rochet (2011) show that risk management is mainly about deciding on the proportion of risk to be borne by the organization itself and the proportion to be outsourced to insurance companies. This might be true in many cases, but in the majority of cases it is about dealing with risk internally. Risk management facilitates decision-making by top management in relation to potential risks. For example, risk management is an integral part of quality management (or vice versa) as organizations continuously seek to reduce the risk of customer dissatisfaction. Furthermore, risk management contributes to decision-making with regard to the capital and assets to be maintained by the organization.

Sutton (2015) states that risk management addresses technical analysis, management systems and human behaviour, in addition to other issues. Despite being an integral part of modern business management today, risk management has emerged over recent decades. In Hard Times of 1854, Charles Dickens indicated that firms did not take pollution and safety issues seriously. However, with the rapid increase in industrial accidents in the early 20th century, codes were set to ensure the safety of workers. In the middle of the century, occupational safety became a priority. By the 1960s, system techniques like the Fault Tree Analysis (FTA) were introduced in the military. These techniques were a shift in the culture of the industrial community leading to the introduction of risk management. Beneplanc and Rochet (2011) clarify that at its early stages, risk management was introduced to deal with

risks during normal times. This was achieved through somewhat simple indicators, with an assumption that the business environment behaves in an expected manner. For example, balance sheets (reserves) were used as approach to protect their operations from financial risks.

In terms of problem fighting and problem prevention, Soeters (2000) suggests that organizations have two sides, a cold and hot one. Cold organizations are ordinary office units with a bureaucratic approach. White-collar work is carried out in these organizations. This side of the organization is not in direct contact with problems. These include periods of 'normal operation' when no action is required to be taken. These might be the period of 'observation and presence'. On the other hand, organizations might have to work in 'hot' conditions under critical, threatening and unclear circumstances. Hot organizations are structured around flexible groups that are critical towards outsiders. Staff in these organizations or units operate with a one team spirit. Soeters (2000) provides the example of management and street police to differentiate between the two sides. Management police normally have codes to follow while street police are flexible to respond to different potential situations.

Likewise, Agarwal and Ansell (2016) cite Ansoff's five levels of turbulence that distinguish between conditions in different markets. The five levels are as follows: 1) repetitive, steady and predictable change; 2) expanding, slow and incremental change; 3) changing, rapid but still incremental; 4) discontinuous, predictable in some respects and discontinuous in others; and 5) surpriseful, discontinuous and unpredictable. According to Agarwal and Ansell (2016), the first two levels, repetitive and expanding, refer to normal market conditions. The third level, changing, refers to volatile market conditions. The fourth and fifth levels, discontinuous and surpriseful, refer to crisis market conditions. Aven and Renn (2010) state that within risk management risks might be categorized systematically based on simplicity, complexity, uncertainty and ambiguity. Simplicity refers to those risks that can be predicted with accuracy like car accident rates and seasonal storms. Complexity refers to those risks that are sophisticated by nature and require advanced methods for estimation.

The fall in biodiversity on earth is an example of a complex risk. Uncertainty refers to difficulty in the prediction of events and their impact. Events like earthquakes represent such risks as no full data on the likelihood of occurrence is possessed by people. This perspective is similar to Knight's perspective to risk and certainty.

However, some allege uncertain events like earthquakes can be predicted. For example, Battison (2011) claims that an earthquake can be predicted within up to 30 seconds before it occurs using advanced systems. She admits that this includes false alarms that can waste resources and shake people's trust in the system. Despite that, Dr. Richard Walker form the University of Oxford confirms that only one earthquake incident had been successfully predicted in due time (Battison, 2001). Still, it is important to acknowledge that 30 seconds can mean saving lives and reducing impact when precautionary procedures are placed beforehand. According to the European Commission (2014), "even 10 seconds can make a difference". The Commission explains that during the Japanese earthquake and tsunami in 2011, thanks to early-warning systems, the high-speed trains were stopped within seconds. It is worth noting that an uncertainty that once was not predictable can become a risk with the advancement of knowledge and technology. Ambiguity, according to Aven and Renn (2010), refers to the different opinions on a specific risk. Cloning, for example, is opposed by many when it comes to creating new humans. Yet it is seen as a hope for the sick when it comes to organ transplantation. Renn and Walker (2008) debate that risk management provides three possible outcomes:

1. Intolerable situations: here the cause (a machine for example) must be terminated or replaced, or impact reduced, and exposure limited.
2. Tolerable situations: here risk is decreased or differently handled either by practical procedures or policy changes.
3. Acceptable situations: here the risk exposes no real threats (negligible). However, risk allocation strategies, in particular risk sharing, might be appropriate.

Rasmussen (1997; 2000) proposed the concept of ‘boundaries of safe operation and performance’. The boundaries refer to the safe zone within which normal operation occurs. He suggests that when a system is developed, it is defined by business, technical and safety constraints. A balance between these three dimensions should keep the system away from the boundary (within the safe zone). On the other hand, crossing the boundaries may cause an accident unless operation is pulled back to the safe zone. Rasmussen (1997) argues that operation usually moves toward the boundaries due to trends in ‘dynamic societies’. These trends include fast change, increasing operation, tight-coupling of operation, fierce competition and deregulation. Add to that, humans do not introduce a stable contribution (Rasmussen, 1997; 2000). Rasmussen (1997) proposes that improved risk management requires three steps: 1) identifying the boundaries of safe operation, 2) building awareness on these boundaries among stakeholders, and 3) enabling stakeholders to adapt to the boundaries. This sounds more like a standardized procedure, which might restrict mobility and; therefore, pose risk. However, the identification of boundaries and spreading awareness on them are not enough by themselves. Still performance might drift over time toward the boundaries with the people being ignorant. The firms should be able to adapt to the changing boundaries or environment. Sometimes people might be tempted to use the space allowed by the boundary getting close to the danger zone. In cases of a drift or use of boundary, the firm reaches at the edge of risk. As explained earlier, it is not only about being within the zone. Balance between the different constraints must be reserved too.

According to Giannakis and Papadopoulos (2016) and Rouse (2016), risk management as a process consists of several steps that vary in accounts within the literature. Generally, there are five main processes or steps for risk management. The first step is the identification and estimation of potential risks/threats. The second step is risk analysis where risk rate (frequency) and consequence are investigated. This aims to determine how each risk will affect the organization. The third step is risk assessment where in-depth evaluation of risks is carried out. Risk assessment is the basis for any decision regarding

the identified risks. Risk mitigation is the forth step where a risk management option is selected for each of the risks. Ridley and Channing (1999) and Renn and Walker (2008) reveal that the risk options vary between risk avoidance, risk reduction, risk transfer and risk retention. Giannakis and Papadopoulos (2016) and Rouse (2016) clarify that the last step is follow-up and monitoring to keep risks under control (see Figure 2.1). In general, the different models and frameworks use a similar approach with some being more detailed. The most important thing is to keep the cyclic process continuous.

Ansell (2017) suggests a somewhat similar four-step process. The first step is awareness which is about perceiving the risk. The second step is assessment which deals with estimating the chance of occurrence and potential consequences. The third step is evaluation which is about judgement and risk perception. The final step is absorption which seeks to reduce and defray risks. Ansell also introduces a more detailed six-step 'risk governance model'. The model involves: 1) defining strategy; this includes setting a risk management strategy within the organization, 2) risk identification, 3) risk assessment, 4) determining mitigation options; the possible options/approaches for risk mitigation are considered, 5) evaluation and implementation; the mitigation options are evaluated and the best option/approach is implemented, and 6) monitoring and review; the newly implemented option is scrutinised to double check effectiveness. The model is cyclic and addresses other factors such as ownership, training consistency and culture.

Figure 2.1: Example of a risk management process.

Source: Giannakis and Papadopoulos (2016).

Pym (2015) confirms that risk management has gone beyond avoidance of risks as it has become a means for benefit generation. Sutton (2015) argues that for an effective risk management, organizations have to pursue a holistic approach addressing, inter alia, safety, environmental aspects, financial loss and reputation. Calkin et al. (2014) suggest that the effectiveness of any risk management system depends on the clarity of the specified risk reduction objectives. Beneplanc and Rochet (2011) stress that risk management must involve four key aspects. First, it should be complete and holistic for missing any risk may lead to devastating results. Despite its importance, the possibility of identifying all risks might be unreachable. Otherwise, there would be no need for all the hustle and bustle on risk management. Second, risk modelling itself should be subject to 'informed scepticism' as many experiences like the subprime market crisis have proved that modelling can be inaccurate or even totally wrong. The over emphasis on calculative risk management can turn itself into a source of risk. Third, the business environment should be dealt with carefully as changes, whether positive or negative, may strike suddenly. Fourth, since humans are the real cause of many crises, good human resource management is essential especially in terms of incentives. It is necessary here that incentives are aligned toward good practice in risk reduction and business continuity to realize the objectives of risk management.

Beneplanc and Rochet (2011) establish that risk quantification represents both the financial impact and rate of risks. Taking in consideration rate and severity, the risk is mapped. Risk mapping quantifies the risks faced by the organization implementing key processes of risk management. It involves four steps: 1) identifying and grouping potential risks, 2) quantifying effect and rate, 3) analysing correlations and possible scenarios, and 4) modelling the impact of risks on the organization. The quality of the process depends on the quality of the data used in the first place. Loss control follows risk quantification where it aims at preventing risks and reducing their effects after occurrence. Ridley and Channing (1999) indicate that loss control is a management system placed to decrease or eradicate risk that might cause loss to an organization.

Beneplanc and Rochet (2011) point that decision over risk allocation is the final necessary step in risk management. The organization should decide on what risks to cover internally and those to transfer to external firms or investors.

Jarrow (2011) shows that with the aim of analysing and predicting risk, risk management models are developed and utilized. Risk management models may be theoretical or quantitative. While theoretical models deal with risks in a cause and effect perspective, quantitative models examine whether variables are statically related. A decision tree represents a theoretical model while time series represent quantitative models. A model seeks to mathematically simplify an event in order to generate inferences and forecasts. Cruz (2002) maintains that models are fundamental in risk management, but they involve high complexity. They include advanced mathematical and statistical techniques for the quantification and estimation of risks. Panjer (2006) states that probability is considered the most useful means to both represent and understand uncertainty and associated risk. Koller (2000) points that in business, normally potential financial and abject failures are assessed. Financial failures refer to values either positive or negative. Abject failures are those conditions that may lead to failure prior to execution. For example, assessing the effect of a planned new factory on the surrounding environment is an assessment of an abject risk.

An example of a risk management model is the Copula model. Chang et al. (2016) say the Copula function was first introduced by Sklar in 1959. Kovacevic et al. (2013) explain that Copula is a statistical tool that has gained popularity in finance recently. Jondeau and Rockinger (2006) state that the Copula function is used to model a multivariate distribution at times when only marginal distributions are available. Another example of a risk management model is GARCH. Huang et al. (2013) explain that the Generalized Autoregressive Conditional Heteroscedasticity, known as GARCH, is a model used to explain volatility clustering. It is a tool for the evaluation of unexpected risks within a context. It is used by financial institutions to quantify stock market

return. Different risk management models are developed and used for different contexts.

Given interdependencies, risk rates should be kept to the minimum to avoid a ‘chain reaction’. For example, an oil leak can cause a boycott campaign by environmental activists (Beneplanc and Rochet, 2011). Dramatically new risks have emerged in the business environment over recent years. Some come from the growing environmental and perhaps human rights concerns by consumers and people in general. Others result from unexpected terror attacks, wars, failures and accidents (e.g. the Samsung Note 7 explosion issue). The various recent crises and difficult times indicate a need to handle risk in a holistic approach. Managing risk in silos, where only the concerned department is involved, is extremely unsafe. Beneplanc and Rochet (2011) argue that the fall of Enron and Lehman & Brothers proves the need for a holistic efficient risk management. Aven and Renn (2010) debate that risk management needs to allow space for the integration of diversity and transdisciplinarity, while at the same time accommodate standardized activities.

2.4 Enterprise Risk Management

Fraser and Simkins (2010) argue that under traditional risk management, many organizations address risk in silos where each department or unit focuses on specific risks. Organizations might fail to integrate risk management into strategic planning. This in turn may lead to overlooking strategic risks known as ‘blind spots’. Enterprise Risk Management (ERM), on the other hand, deals with risks in a holistic integrated approach. Every department or unit contributes to the process via a strategic, holistic and integrated system for risk management. ERM seeks to explicitly integrate risk management into both strategies setting and implementation. Olson and Wu (2008) show that ERM is a process that emphasizes managerial focus developed in the 1990s. In a speech in 2008, the US Federal Reserve Governor emphasized that survivability of organizations depends on

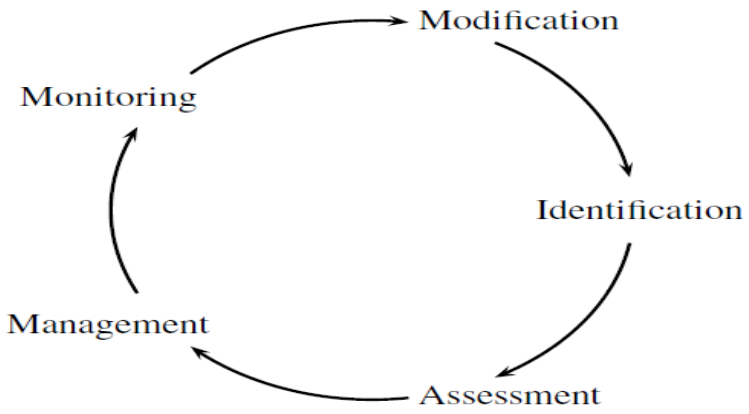
integrating risk management into strategic planning (Fraser and Simkins, 2010).

According to Fraser and Simkins (2010), ERM is defined as “a process, effected by an entity’s board of directors, management and other personnel, applied in strategy setting and across the enterprise, designed to identify potential events that may affect the entity, and manage risk to be within its risk appetite, to provide reasonable assurance regarding the achievement of entity objectives”. This definition was originally introduced by the Committee of Sponsoring Organizations of the Treadway Commission (COSO). ERM is looked at as an evolution of traditional risk management. Zhao et al. (2015) claim that the evolution of ERM has been driven by governance requirements (e.g. New York Stock Exchange, UK’s Corporate Governance Code and ISO 31000:2009). Sweeting (2011) points that ERM is a continuous process that utilizes a five-stage control cycle. These are the same stages usually used in traditional risk management (Figure 2.2 describes ERM control cycle). He categorizes ERM responses to risks into four main groups: risk reduction, risk removal, risk transfer and risk acceptance. These are obviously the same response options in traditional risk management. However, Zhao et al. (2015) explain that unlike traditional risk management, ERM pays attention to risk interdependence across the organization. Hence, it can be inferred that ERM is more a philosophy or mindset toward risk management, where a more holistic and integrated approach is considered.

Simona-Iulia (2014) shows that ERM sets goals that become the focus of an organization-wide risk management program. According to Olson and Wu (2008), ERM aims at tackling the effect created by risk interdependencies across the different units of an organization. Chitakornkijsil (2010) asserts that there are two main objectives that risk management seeks to achieve: pre-loss goals and post-loss goals. Pre-loss goals refer to the goals that need to be in place during normal conditions. These include, inter alia, compliance to regulations and social responsibility. They mainly concern with reducing anxiety within the organizational context. Post-loss goals refer to the goals that need to be in place in case of an adverse condition. The post-loss goals

concern, inter alia, survival, business continuity and stability. Chitakornkijsil (2010) applies these concepts to ERM. These represent the strategic and operational goals known in risk management. Arena et al. (2011) explain that ERM can be used for decision-making, compliance with governance requirements and internal auditing.

Figure 2.2: ERM control cycle.



Source: Sweeting (2011).

Hallowell et al. (2013) indicate that the implementation of ERM improves efficiency in the use of key resources, ability to assess interdependency of risk, risk management, financial stability and the overall risk culture. They mention that another important benefit for ERM is its contribution to preventing handling risks by multiple actors at multiple times (duplication of effort). This does not only improve efficiency, rather it mitigates the risk of creating imbalance, which might produce a worse scenario. For example, a department shifting to lean practices can reduce its inventory tremendously, however, reducing the inventory without considering the needs of other departments can impact operations. Harvey (2015) indicates that many of the issues that ERM deals with are dealt with by traditional risk management. Yet, he adds that ERM is not just about addressing risks, as it creates value for the organization. Simona-Iulia (2014) confirms that ERM can be applied in any organizational context. It has been implemented in various businesses

including financial and insurance institutions, manufacturing firms, the energy sector and chemical industries (Zhao et al., 2015).

Bromiley et al. (2015) believe that the 2007 subprime crisis shed doubts on the effectiveness of ERM. For example, Countrywide Mortgage, which was a model for its successful ERM programme, almost became bankrupt in 2008. Lundqvist (2014) and Bromiley et al. (2015) add that despite there is still limited research on ERM, the results of the undertaken research indicate mixed outcomes. Simona-Iulia (2014) establishes that ERM cannot predict all potential risks indeed; thus, crisis management plans have to be in place for emergencies. It is important to emphasize that any model, including ERM, cannot be perfect since dealing with uncertainty. Such programmes depend on the human factor, which remains prone to errors. Yet it is assumed that having an ERM programmes reduces vulnerability to risks to a certain degree. This degree, no matter how small it may be, might be the only reason for survival during difficult times.

2.5 Organizational Resilience

Chakravorty (2015) indicates that the term Resilience originates from the Latin word 'resilio' or to jump back. Coutu (2002) and Bonilla (2015) explain that the study of resilience began 4 decades ago when a psychologist, Norman Garmezy, started studying the resistance of some children to problems. The term has been studied in various contexts including the business environment ever since. Helm (2015) says that it should be noted that there is no ‘universally’ agreed upon definition for resilience in general yet. In simple words, Coaffee (2013) defines resilience as "the capacity to withstand and rebound from disruptive challenges". Chakravorty (2015) shows that in engineering the term refers to the ability of a system to get back to the 'normal condition' after a 'turbulent' change. Institutional or organizational resilience is defined by Vogus and Sutcliffe (2007) as "the maintenance of positive adjustment under challenging circumstances such that the organization emerges from those conditions strengthened and more resourceful". The rest of the research uses both resilience and organizational resilience interchangeably to refer to organizational resilience, unless stated otherwise.

Mitchell and Harris (2012) says it is important to be aware that resilience is a risk management approach. Helm (2015) points that initially risk management aimed at assessing the 'likelihood' specific impacts may occur because of a particular event, bearing in mind the source. These are called the 'known unknowns'. Later it expanded to unexpected events, the 'unknown unknowns'. Resilience is identified as a feature of a system that enables it to go through and rebound from adverse conditions. In other words, resilience is not just a predetermined measure for a predictable event, it is rather a characteristic enabling the system to adapt and respond to shocks. North and Varvakis (2016) suggest that organizational resilience infuses a 'paradigm' shift into the organization, as organizations have to be ready for quick reactions to changes even under unpredictable and disordered conditions. According to the Australian Government (2011), in general, resilience, as a risk management approach, focuses on protection, performance and adaptation. Protection is about building in enough robustness to stand against adversity. Performance refers to the capability to do things right the first time and ability to respond to change very quickly. Adaptation is a means to keep pace with changes by learning and exploring.

Adverse conditions affect firms in different ways leading to one of the following situations: 1) decline, where the firm accepts the fact that the event might stop its operations; 2) survival, where the firm manages to operate in reduced form; 3) bounce back, where prior level of operations is regained effectively within a short time; and 4) bounce forward, where operation is further improved making gains from the event (Australian Government, 2011). Sawalha (2015) indicates that these levels represent the resilience objectives of firms. Yet, for a business, it is important to be able to deal with the situation encountered. That is the essence of resilience as improvement can be sought using different approaches. Survival, even in a somewhat reduced form is essential for any firm during adverse conditions. Business continuity is the main role of resilience within the organizational context.

Theorists have identified two types of resilience, inherent and adaptive resilience. Inherent resilience is capability under normal conditions such as reallocating resources to face price fluctuations and substituting the source of damaged inputs with another. Adaptive resilience is capability during crisis conditions like enhancing the market through providing information to match suppliers to customers (Rose, 2004; Tierney and Bruneau, 2007; Orchiston et al., 2016). Rose (2004) states that resilience can occur at three different levels: 1) microeconomic, at the individual level of firms, households or organizations; 2) mesoeconomic, at the level of economic sector, individual market or cooperative group; 3) macroeconomic, at the level of all individual units and markets combined. The Global Risk Report (2013) and Howell (2013) identify 5 components for organizational resilience, namely, robustness, redundancy, resourcefulness, response and recovery. Kantur and Iseri-Say (2012) and Wicker et al. (2013) suggest that organizational resilience is based on 4 components: robustness, redundancy, resourcefulness, and rapidity. Giordano (1997) mentions 7 qualities of resilience: resourcefulness, self-confidence, curiousness, self-discipline, level-headedness, problem-solving and flexibility. Ponomarov and Holcomb (2009) indicate that resilience has important aspects, namely, adaptability, flexibility, maintenance, recovery and dealing with the outcomes of resilience.

Valikangas and Romme (2012) suggest two dimensions for resilience: operational resilience and strategic resilience where the first is about responding to difficulty while the other is about being prepared to respond to difficulty. Van Gorder (2013) suggests that a resilient organization is based on 11 principles: transparency, honesty, consistency, continuous reflection, faith in leadership, pride in organization, continuous and effective real-time communication, accountability, compassionate leadership, stability and engagement. Mallak (1998) identifies 7 principles of resilience: perceive experiences constructively, perform positive adaptive behaviours, ensure adequate external resources, expand decision-making boundaries, practice bricolage, develop tolerance for uncertainty and build virtual role systems.

These principles are the base for a resilience culture which results in a resilient organization, suggests Van Gorder (2013).

The Australian Government (2011) states that a resilient organization is distinguished through its leadership style and culture. Such organization has a culture keen for change and innovation with consistent commitment to resilience. It enhances initiative-taking by spreading trust, setting a clear purpose and empowering people. Besides promoting the overall organizational resilience, the firm seeks to promote the resilience of its employees. Most importantly, highest level administration is engaged in resilience and leads the way ahead. In addition to its effect on leadership and culture, resilience affects networking organization-wide. It promotes the creation of mutual relations, support arrangements and partnerships. It recognizes the interaction inside the firm and identifies any potential vulnerabilities. Finally, resilience encourages open communication, while at the same time alleviating reclusion. Mendonça and Wallace (2015) consider boundary-spanning capability, the ability to communicate with external partners and competing firms and make decisions, to be one of the important concepts of resilience. Hence, organizational resilience takes risk management a step further beyond ERM by considering both external partners and readiness for unexpected events.

Valikangas and Romme (2012) show that enhanced resilience involves training to improve preparedness for change. The US electronic retailer giant BBB trains its staff on three strategic management practices to raise resiliency. First, the firm seeks to enhance employees' ability to see multiple future scenarios, and test and prepare responses. Second, in order to create a resilient organization, the staff is introduced to abnormal situations, so they are ready when these happen. Third, to keep pace with change, a resilient entity is experiment-oriented. Here, the firm continuously explores new ways to better achieve its goals. This encourages innovation and opens doors to further learning. As a result of this approach, BBB achieved significant increases in revenue. Lengnick-Hall et al. (2011) suggest that resilience is

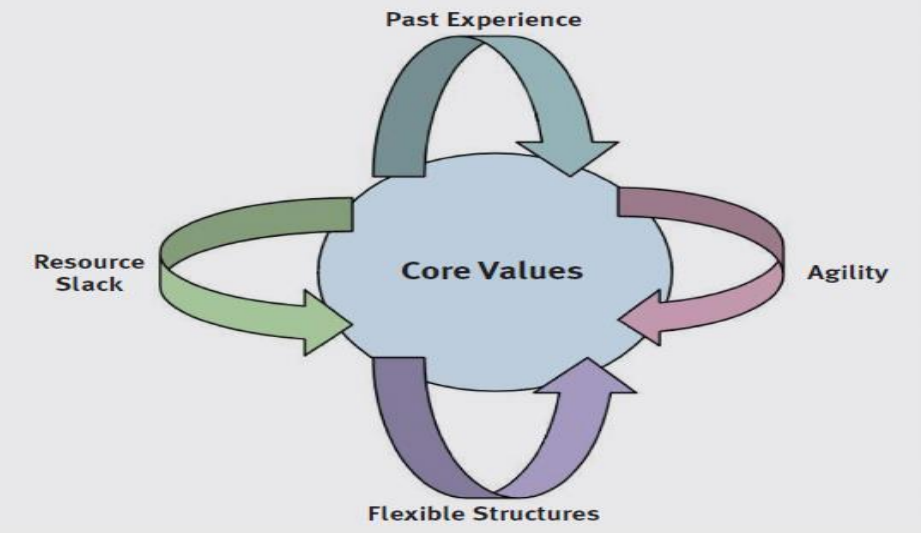
further improved by managing human resources in an attempt to develop employees' competencies. According to Cole (2015), the adoption of a resilience-based approach requires 1) acquisition of knowledge needed to be prepared for disruptions in terms of prediction and putting responses in place; 2) decrease the level of uncertainty of potential risks; and 3) reduce system's exposure to risks and prepare a wide range of responses. Knowledge management plays a vital role in resilience as it reduces uncertainty and exposure to risk.

Cameron and Quinn (1999) say that for an organization to be resilient, it must have the needed resources to get through the adversity and be used to similar experiences. It is important to note that the lack of resources is normally the source of risk. Hence, this assumption might not be always plausible. Similarly, even organizations that managed to go through various difficulties once, might not do it again. So, it is more about how firms utilize what they have or can mobilize to overcome a difficulty. Ambulkar et al. (2015) confirm that effectively developing and managing resources makes the firm ready for adverse conditions. Bonilla (2015) adds two other aspects, flexibility in structure and agility, to form the organizational resilience model (see Figure 2.3). Pal et al. (2014) suggest that for a firm to support resilience, it needs three main assets: resourcefulness, competitiveness and, learning and cultural aspects. Mallak (1998) suggests that in their quest to build-in resilience, managers need to do the following: 1) practice positive reinforcement to promote required behaviour; 2) give positive feedback to help individuals make gain from failure; 3) delegate decision making while making sure others have the required resources to take the responsibility; 4) introduce an appropriate organizational structure to facilitate communication and exchange of information; and 5) develop bricolage skills via training.

According to Lengnick-Hall et al. (2011), the competences, activities, and relations of people, and units within the organization produce resilience. Paté-Cornell (2012) and Paté-Cornell and Cox (2014) believe that the 'Black Swan' concept by Taleb is used as an excuse by organizations to justify bad risk

management. Black swans refer to events that are of large-scale effects and consequences, and not predictable (Taleb, 2012). However, it is agreeable that management plays a central role in any failure, but it is important to be realistic when discussing resilience. As Taleb (2012) explains that, though, retrospective analysis normally indicates the ability to predict any major event, in reality perfect prediction does not exist. The different organizations around the world are built around the individual and collective capacity of employees. These vary across cultures, organizations and times. Add to that, knowledge, technology and other resources vary further complicating the situation. Thus, resilience does not mean ending all problems and risks. It is an approach that attempts to develop the potential to deal with unexpected events.

Figure 2.3: Organizational resilience model.



Source: Bonilla (2015).

The growing uncertainties and vulnerabilities in the world market along with more demanding customers and the challenge posed by climate change make resilience a matter of existence for organizations, especially those working in environments marked with rapid volatile changes and risks (Mallak, 1998; Lengnick-Hall et al., 2011; Kantur and Iseri-Say, 2012; Mafabi et al., 2012; Winston, 2014). In fact, it goes beyond organizations to economic sectors, countries and groups of countries (e.g. conventional car-makers, oil-producing countries…etc). Clark et al. (2012) assume that rapid technological changes

and advancement also pose a challenge that organizations have to face and adapt to. These threats and challenges can come from both inside or outside the organization (Annarelli and Nonino, 2016). Fisk and Dionisi (2010) and Bonilla (2015) argue that for an organization to be resilient it must go through severe or risky conditions while adapting to the situation and not losing its ordinary level of functioning. It is important to mention here that ability to overcome a difficulty can sometimes result from sheer luck. Interventions from the outside can be another reason for survival. For example, government bailout might revive an entire industry or a specific organization. This is to say that survival cannot only be attributed to resilience. Unless the organization intentionally adapted to the conditions using the practice of resilience, recovery cannot be attributed to resilience. There should be resources, capabilities and characteristics within the organization that enhance and exhibit resilient performance.

Stoltz (2004) says that resilience-based strategic planning is essential to achieve better business results and overcome competitors. Sullivan-Taylor and Wilson (2009) and Wilson et al. (2010) explain that resilient organizations are well prepared to adversities, adapt to the changing situations, bounce back and achieve higher performance. Gibson and Tarrant (2010) ascertain that firms with a resilience-based approach better understand the challenges around and are willing to invest to respond to adversities. Looking at the importance of the concept of resilience, the US National Institute of Standards and Technology has identified standards that can help enhance firms' resilience (Hosseini et al., 2016; NIST, 2016).

According to the Australian Government (2011), pursuing a resilience approach brings in enormous advantages for the organization. At the leadership level, resilience leads to better outcomes from planning and enhances leadership capacity. In relation to performance, resilience reduces cost incurred due to disruptions; regains operations and profits to the previous level quickly; and improves reputation. Add to that, resilience makes the system change-ready through improved foresight of threats, enhanced

innovation, and improved ability to utilize adversities and turn lessons into gains. Again, it is important to not get carried away by enthusiasm when talking about any concept. Still, most of the above-mentioned benefits are based on theoretical perspectives. Though, they make sense and are sound and logical, this thesis introduces them as perceived benefits for the pursuit of a resilience approach. Note, a resilient approach is not a single defined way of business management. Different firms could use different strategies and practices to withstand a difficult condition or recover from it. Creativity and innovation play an important role in such approaches since new challenges might require new solutions. The cases in the following section provide some evidence on the benefits of a resilience approach in management.

In terms of implementation, various firms from different business sectors have implemented resilience into their business plans and operations. Firms may implement resilience in compliance with public policy or as an internal initiative. From the electronics giant Philips, Wal-Mart, the City Council Offices of Bankstown (Australian Government, 2011), US air force (Chakravorty, 2015), US Department of Homeland Security (Sawalha, 2015 cited The Reform Institute, 2008), tourism (Orchiston et al., 2016), nuclear power plants and water distribution firms (Labaka et al., 2015), and Community Sports Clubs (Wicker et al., 2013), resilience has proven to be a successful bet in both the private and public sectors. According to an executive from UK's Association of Insurance and Risk Managers in Industry and Commerce, the InterContinental Hotels Group (IHG) invested in creating resilience awareness and culture. As a result, the firm developed an ability to deal with unexpected events (Hurrell, 2014).

In a case study provided by the Australian Government (2011), two firms faced an unexpected event as a burst pipe flooded the two offices. These were two completely separate incidents occurring at different times and locations. The first was a legal firm, while the other was an accounting firm. The legal firm operated under a resilient mindset. It managed to return to normal operation within 6 days. The accounting firm took 6 weeks to reassume work. The same

report introduces an amazing case of an Australian Hi Tech company. A fire in the newly moved-to premises affected the whole facility, 80% of stock and around 400,000 products. Such situation could have easily wiped a business out of the market. Production and sales activities were prioritized to face the event. Resources were devoted to products with the highest financial return. Existing customers were also prioritized over finding new customers. Now, the firm has expanded and operates overseas. The strategies, structure, culture and people within the company were the success factors. These together created a resilient firm.

The above search and review show that the literature provides various models in relation to organizational resilience. Still, two main components stand out, namely, strategic and operational resilience, where the first represents robustness and the latter resourcefulness. Together, these two are meant to design a resilient system and adapt to difficulty. The remaining concepts should be considered under these two capstones. The most important aspect, which is still to some extent undervalued, is the integration of the different concepts, components and practices, whether they relate to resilience or resourcefulness (see next section for resourcefulness). Ensuring these parts are synchronised can enhance performance and ensure better results. Perhaps a good practice would be integrating resilience into the existing management system (e.g. quality system) to build on current capabilities.

2.6 Resourcefulness

2.6.1 Definition

From the above discussion on resilience, resourcefulness is the most reiterated concept indicating the importance of this construct. The Oxford English Dictionary defines resourcefulness as being “skilled in devising expedients or in meeting difficulties; full of practical ingenuity; rich in reserves or resources”. The Merriam-Webster online dictionary (2016) defines resourcefulness as being “able to deal well with new or difficult situations and to find solutions to problems”. In the field of cognitive behaviour,

resourcefulness is introduced as “the ability to cope with difficult, stressful and challenging situations and engage in cognitive self-regulating or self-controlling adaptive responses” (Sahin et al., 2015 cited Meichenbaum, 1977 and Rosenbaum and Jaffe, 1983). Rosenbaum and Jaffe (1983) were the first in the field of psychology to come up with the concept of ‘learned resourcefulness’ which they define as “a basic repertoire of behavior and skills (mostly cognitive) by which individuals self-regulate internal responses (such as pain, anxiety and cognitions) that interfere with the smooth execution of ongoing behavior”.

In the business and management literature, the concept has been defined by a number of researchers. The term resourcefulness is defined by Bruneau et al. (2003) as “the capacity to identify problems, establish priorities, and mobilize resources when conditions exist that threaten to disrupt some element, system, or other unit of analysis”. Tierney and Bruneau (2007) define resourcefulness as “the ability to diagnose and prioritize problems and to initiate solutions by identifying and mobilizing material, monetary, informational, technological, and human resources”. McCann and Selsky (2012) define resourcefulness as “the creative assembly and use of individual, team, organization, and ecosystem capabilities and resources to act and react to events in the external environment”. Howell (2013) defines resourcefulness as “having networks of trust that enable flexible self-organising to adapt to crises in novel ways”. Newsome (2014) defines it as “the ability to adapt to crises, respond flexibly and – when possible – transform a negative impact into a positive”. According to Lengnick-Hall and Beck (2009), in the organizational context, learned resourcefulness is defined as “the accumulation of established and practiced behaviors for innovative problem solving that result in heightened levels of ingenuity, inventiveness, and bricolage (the imaginative use of materials for previously unintended purposes)”. The term resourcefulness is used in this context as provided by Bruneau et al. (2003) for it gives simple and practical guidance on the concept; the other definitions; however, are used to elicit further characteristics of the concept.

2.6.2 Assumptions

In the literature, resourcefulness is constructed around the following assumptions:

1. Being resourceful reflects availability of the resources required to restore/maintain operation (Tierney and Bruneau, 2007);
2. When organizations build in a capacity for self-organization, they become more likely to respond to unexpected challenges (Global Risks Report, 2013);
3. Resourcefulness is the most important component of resilience, as availability of resources is an important condition for the functionality of other components (Wicker et al., 2013).

2.6.3 Qualities

According to Abbott (1990), who addressed resourcefulness in the IT field, in order to be resourceful, a system has to retain three qualities:

1. 'Functional Richness': this reflects ability to achieve the same result using multiple approaches. Here, in case a system fails to achieve the result through the normally utilized approach, a second method is used to restore/maintain operation. This is what Abbott calls a 'non-orthogonal' system;
2. 'Explicitly Testable Goals': it is essential for the system to be able to detect whether it has achieved its goals or not. This might entail also the extent of achievement;
3. 'Ability to develop and carry out plans for achieving its goals': in order to make use of functional richness, the system needs to pay considerable attention to its goals. This involves setting goals and sub-goals, and thoroughly analysing them.

2.6.4 Elements

Based on the definition provided by Bruneau et al. (2003), resourcefulness is constructed of three main processes: (1) problem identification, (2) hazard prioritization and (3) resource mobilization. This thesis adds (4) organizational learning and (5) sensemaking as deemed instrumental elements for resourcefulness based on the rest of definitions and reviewed literature.

2.6.4.1 Problem identification

Problem identification is generally addressed within Risk Management and Enterprise Risk Management (ERM) under risk assessment and evaluation. Renn and Walker (2008) explain that risk assessment is the "task of identifying and exploring, preferably in quantified terms, the types, intensities and likelihood of the (normally undesired) consequences related to a risk". Risk assessment started as a technique used by the military to ensure the reliability of equipment and air transport (Royal Society, 1983). The aim is to identify risk sources and potential uncertain effects (Graham and Rhomberg, 1996) that may hinder the achievement of organizational goals. Renn and Walker (2008) and Aven and Renn (2010) reveal that risk assessment encompasses three components in general, identification and estimation of hazards that can lead to negative effects; assessment and analysis of exposure and vulnerability; and the final estimation of risk combining both probability of occurrence and severity, and potential consequences. COSO (2004) points that this should also cover any events, whether internal or external, that may affect the system's ability to achieve the set objectives. The aim here is to prepare the firm for a best reaction when the risk occurs.

Assessment of medical drugs and food, for example, shows how risk assessment is vital. In the late 1950s and early 1960s, the insufficiently-tested 'Thalidomide' drug, caused thousands of births with defects around the world (Hoffler, 1962; Sjostrom and Nilsson, 1972; Burgio, 1981; BBC, 2005; Laurance, 2011). Examples of risk assessment tools include: The Common Assessment Framework (CAF) by UK's Department of Children, Schools and Families, and Asset Framework by UK's Youth Justice Board (Baker and

Kelley, 2011). Luckily, risk assessment through the evaluation of food, medicine and other elements have saved the lives of millions of people. Assessment can be conducted by the firm itself or a third party. Hermanson (2005) shows that the damage left by Hurricane Katrina was already identified and seen. A newspaper had discussed the issue and accurately predicted some of what went on three years later. Unfortunately, the response to the problem was disappointing. Lives and resources could have been saved (Hermanson, 2005).

However, Nan and Lu (2014) verifies that social support either at the community and organizational levels proved to be a successful bet. Realizing the communication issue during the event, people used social media to exchange information to direct and provide help for those in need of it in affected areas during 2005 Hurricane Katrina. Similarly, social support via social media played an important role during the 2008 Sichuan Earthquake and 2010 Haiti Earthquake. Nourse (2009) explains that social support was used within some for-profits and non-profits to ensure continuity of operation. Employees replaced those exposed because of the hurricane enabling service provision during the crisis in New Orleans. This indicates the importance of external sources for the identification of hazards. Organizations have to build internal and external channels for this purpose. Attention must be paid to voices coming from social media, forecasts and others, beside local (organization level) systems. Andreeva et al. (2014) explain that responsibility for risk should be distributed over the network of stakeholders. Thus, these stakeholders become responsible for risk and accountable for their behaviour. They use ‘knowledgeable supervision’ to refer to shared-responsibility for risk management.

2.6.4.2 Risk prioritization

Risk prioritization is an important tool used to identify the most threatening hazards an organization might face. Hazards are ranked based on their impact or link to the issue of concern. Bueno et al. (2016) affirm that risk prioritization helps in directing resources and efforts to the threats that are more likely to

affect operation or objective achievement. Nassiri et al. (2013) explain that a major step within the risk prioritization activity is the development of a ranking scheme or criteria. According to the American Society for Quality (ASQ) (2016), the criteria vary across the different sectors and fields of industries, giving utmost attention to the most impactful risks. The impacts can affect, inter alia, the safety of people or the financial status of the organization.

The Failure Mode Effects and Criticality Analysis (FMECA), created by the US military in 1940s and developed later by several industries, is an approach, of many others, to identify potential 'failures' and their consequences, beside prioritizing these consequences according to their impact (ASQ, 2016). Mandal et al. (2015) indicate that FMECA has been deployed in various industries and developed to overcome the shortcomings of its traditional version (FMEA[1]). Goetsch and Davis (2014) demonstrate that FMECA is a tool to analyse and define potential hazards; it does not introduce solutions. It can be used to identify failures in both products or services, and processes (Goetsch and Davis, 2014). The human capacity still has to lay the most important part by interpreting outcomes and introducing solutions.

The International Federation of Accountants (IFAC) (2013) points that commonly the overall risk prioritization process requires the involvement of stakeholders, both internal and external, to decide on the best interventions. Wyman (2009) postulates that different groups of stakeholders are involved in data collection regarding vulnerabilities. The Global Risks Report (2014) indicates that a broad range of participants, including, ERM team, Head of Division Business units, Frontline Employees, Managers, Consultants, the Board, Audit Committee, Executives and others, take part in the risk prioritization process. Business Continuity Managers need to be involved indeed. It is important to ensure that people who perform the relevant task are involved and empowered in the process. As part of the risk assessment process, many firms have embraced hazard prioritization in order to integrate the most threatening ones in strategic planning; this includes a periodic

[1] Failure Mode Effects and Analysis.

formalized assessment (The Global Risks Report, 2014). The process may establish a risk map ('heat map'), where hazards are plotted against their likelihood (Wojtasiak-Terech, 2015).

Emergency units in hospitals exhibit a good example of the importance of prioritization, where critical cases must be admitted first. Apgar (2006) shows that in the banking system, banks focus on operating risks in relation to capital, bank operating managers, on the other hand, focus on process risks, while the people in IT focus on security risks. This reflects the priority given to different risks in different departments, based on risk assessment. However, this needs to be done in an integrative approach organization-wide. Risk prioritization should not mean working separately neither at personal or unit levels. As Dell (2005) explains, this is known as 'silo' behaviour where the focus is to fulfil a specific function rather than realizing a process outcome. At the same time, managers and employees have to be objective in the risk prioritization process. Personal and departmental interests must not affect their contributions and decisions.

2.6.4.3 Resource mobilization

According to Henslin (2001) and Zorn et al. (2013), one of the main theories in the field of sociology is the resource mobilization theory that came about in the 1970s. The theory basically assumes the ability of people ('movement's members') to acquire resources and mobilize people to accomplish a shared goal. Batti (2014) states that resource mobilization is defined as "a process whereby resources both financial and non-financial are mobilized either externally or internally to support organizational activities". Diana et al. (2014) define resource mobilization as "the leveraging and/or redirection of resources to support implementation of effective prevention strategies." Ellegaard and Koch (2012) state that in the business environment, resource mobilization refers to organizations' activities in relation to preparing, initiating, and utilizing the resources it has to be used by customers.

Achamkulangare (2014) establishes that with the high uncertainty organizations are surrounded by, resource mobilization has turned into a high

priority world-wide. Batti (2014) indicates that resource mobilization presumes that non-financial resources play a crucial role and some of the resources can be internally produced by the organization itself. Diana et al. (2014) explain that resource mobilization consists of two aspects, namely, leveraging and redirection. Surana and Anadon (2015) points that, in general, organizations, based on size and industry, have different approaches toward resource mobilization due to their distinctive nature; public sector institutions, for instance, might be ready to take higher risks and lower returns, while privately-owned firms normally seek opportunities with lower risk and higher return. Also, large-scale private firms normally build a slack that can be utilized more easily when needed. Though, the practice of using slack is common, practices like Lean have pushed toward eliminating inventory. Thus, a better approach can be realised through close partnerships with suppliers, for example, since having inventory creates risk of damage, loss or expiration; a good relationship may deliver requirements when necessary.

According to Achamkulangare (2014), incorporating resource mobilization within strategic planning has a positive impact on the mobilization process itself. Kalyan (1991) explains that the Indian government devised a resource mobilization campaign between 1985 and 1990 as a means for resource generation, which included service price review, enhancing capacity utilization, improving productivity and using inventories. Goetsch and Davis (2014) say that resourceful people are those able to carry out the job despite the lack of needed resources. They utilize both ideas and resources in ways others do not consider. According to Olcott and Oliver (2014), after the catastrophic earthquake of Japan in 2011, a remarkable resource mobilization process took place in Japan to meet the commitments to customers. The resources came from different sources including customers and competitors.

It is important to note that resource mobilization is a creative and innovative process, especially at difficult times. All resources, whether human, financial or material must be utilized in the best possible way. The case of the Australian Hi Tech company discussed earlier (see section 2.5) is a good

example for a good resource management and mobilization process. The cultural dimension might have an important role. Cooperation between competitors in the Japanese firm case above might have not been applicable in many other cultural contexts. However, building networks and ensuring several alternatives are in place are important for a resilient performance.

2.6.4.4 Organizational learning

Continual change in the external environment requires adaptation, while new knowledge makes up for the change in the surrounding environment (Cangelosi and Dill, 1965; Simon, 2001). MacKinnon and Derickson (2013) argue that resourcefulness has emphasis on establishing learning and adaptation that emerge from the local priorities and needs of the individuals and organisations. Cyert and March (1992) discuss learning within the business environment. They argue that procedures are a result of learning, which can be adaptive to the existing conditions facing the firm. Fiol and Lyles (1985) explain that change is not always a sign of learning, as it comes as an adaptation. Dixon (1999) reveals that organizational learning is defined as "the intentional use of learning processes at the individual, group and system level to continuously transform the organization in a direction that is increasingly satisfying to its stakeholders". Simply, it refers to learning as a change that is placed in the organization following its acquisition of an experience (Huber, 1991; Argote and Miron-Spektor, 2011).

Learning in the organizational context may refer either to the lesson learned or the process through which the lesson was learned. Dixon (1999) indicates that learning occurs through four processes: 1) information generation, 2) integration of newly generated information, 3) interpretation of information and 4) action taken as a result of the previous three steps. These processes together are known as the learning cycle, where the last process contributes again to the first process providing feedback, which leads to continuous improvement and transformation. In case an organization uses benchmarking data, for instance, the process can be shortened by cutting some steps. The same applies with the arrival of knowledge and expertise via new staff, for

example. Argote and Miron-Spektor (2011) show that experiences vary in terms of ability to make inferences from; more frequent experiences tend to be easier than rare and obscure ones. Hence, different learning approaches (e.g. experiments) might be utilised. Argyris and Schon (1996) and Dixon (1999) argue that the learning process should be collective at the organizational level, within an organizational context that facilitates its role. Simon (2001) maintains that this learning must be meaningful; it should be reachable whenever required. Otherwise, the whole process would be worthless.

According to Alder and Clark (1991), based on the extent and nature of change, learning is classified into two types, single-loop and double-loop learning. Single-loop learning introduces change that does not affect the theoretical approach in place. For example, change in product specification affect the product itself or maybe the process, however, it does not have to affect the operational strategy. Double-loop learning introduces changes to the strategy, values and operational theory of the organization. At the internal level, the learning process is a complex one as dealing with unidentified problems in a process may lead to actions with negative effects, mostly temporarily, in some cases. Argote (2013) shows that learning curves graph cost and output over time. They simply graph output against experience over a certain period of time. Normally, productivity increases as experience increases. It is important to have diversity among organizational actors to ensure more effective learning. As Page (2014) and Lanaj et al. (2018) explain, divergent perspectives improve performance and ultimately resilience.

Dixon (1999) reports that in the 1960s, the World Health Organization (WHO) deployed mass vaccination to battle smallpox world-wide. However, in a Nigerian region area where 90% of the population was vaccinated, smallpox outbroke while limited supplies of the vaccine were available. Thus, the affected cases were identified, and those affected and the people living around them were vaccinated to prevent the spread of the disease. This new

learned ‘surveillance-containment’ strategy was adopted later by WHO. The results showed that the disease could be contained by vaccinating 50% of the population. Indeed, continuous knowledge acquisition and learning are vital for survival. The rules of the market or business environment change constantly. This means more efforts must be put to identify both potential issues and best practices. Most importantly, the acquired knowledge should be meaningful to the organizational context. It needs to be disseminated within the whole context for people to be able to act when a difficulty hits. This requires education and training to be integrated within the business strategy.

2.6.4.5 Sensemaking

Maitlis and Christianson (2014) introduce sensemaking as “a process, prompted by violated expectations, that involves attending to and bracketing cues in the environment, creating intersubjective meaning through cycles of interpretation and action, and thereby enacting a more ordered environment from which further cues can be drawn”. Weick (1993) and Weick et al. (2005) explain that sensemaking simply refers to the extraction of meaning from the issues encountered in a way that enables the system to minimize the effects. This is done by making ‘retrospective sense’ of what goes around. In other words, it is a process where cues/difficulties or adverse conditions are turned into meaningful communication that serves to overcome the situation. Mattsson et al. (2015) suggest that sensemaking has two dimensions, the sensemaking process and the outcome of the process.

Weick (1988) finds that under abnormal/turbulent conditions sensemaking becomes more difficult. He explains that it is important under such conditions to have an adequate and reliable sensemaking process to make sure things do not get out of control. Ben-Shalom et al. (2012) argue that under extreme conditions like wars and catastrophises, sensemaking capability is affected by personal traits like determination and resilience. Those who exhibit the required characteristics, like resilience, can produce a good sensemaking process. This should not be understood that sensemaking cannot be acquired through training. Weick et al. (2005) introduce a number of characteristics

about the organization of sensemaking. They indicate that sensemaking 1) organizes the chaotic vision, 2) starts with noticing and bracketing, 3) is about labelling and categorization, 4) is retrospective, 5) is about presumption, 6) is social and systematic, 7) is about action, and 8) is about communication to organize. It is better to look at sensemaking in a more simple and direct approach to enable disseminating it across the spectrum of employees. Weick (2012) demonstrates that sensemaking can be a continuous (ongoing) or periodic process (project-specific). In some contexts, where cues keep occurring, sensemaking might appear to be continuous while it is in fact a set of separate periodic processes.

However, not always things go as planned or expected. In The Collapse of Sensemaking, Weick (1993) discusses the Mann Gulch Incident, where anxiety, failure in communication and lack of resources led to catastrophic results to firefighters sent to extinguish what was initially thought a minor incident. The thought work needed for the success of the work was not done properly to create meaning and order of the situation, says Weick (1993; 2007). Brainstorming sessions resemble sensemaking in organizations, where meaning is drawn from the issues encountered.

Oclott and Oliver (2014) introduce the Renesas's Naka factory example in Japan. Before recovery actions took place, a huge sensemaking process was carried out involving both people from the factory and others joining from outside. The thought work estimated recovery to take 6 months; however, good sensemaking halved that. Organizations need to be capable of being 'informedly sceptic' as critical thinking proves vital. Obviously, there are people with inherent sensemaking skills around, but there are others without such skills. All people need to have these critical thinking skills to tackle any issue immediately. Many of the big issues resulted from tiny avoidable mistakes. The history of air traffic crashes presents numerous examples. This is not to say that sensemaking results in perfection. It is at the end carried out by humans and might go wrong. But, not having such process at hand could result in a more catastrophic outcome.

2.6.5 Attributes

The Global Risks Report (2013) identifies 3 attributes for resourcefulness, namely, capacity for self-organization, creativity and innovation. These are used by the report as a basis for potential indicators to measure resourcefulness as a component of resilience. McCann and Selsky (2012) indicate that resourcefulness-job-related skills include entrepreneurial spirit, flexibility and creative mind. The thesis considers both mindfulness and loose-coupling important attributes of resourcefulness, since both cognitive awareness and preparedness, and the structure of the firm are vital to be ready to absorb any shocks immediately. Since both adaptability and flexibility are inherent within self-organization (Heylighen, 2001;Global Risks Report, 2013), the attributes of resourcefulness can be summarized to include self-organization, innovation and creativity, entrepreneurial spirit (corporate entrepreneurship), mindfulness and loose-coupling. The next sections shed more light on these attributes.

2.6.5.1 Self-organization

Di Marzo Serugendo et al. (2005) define self-organization as “the mechanism or the process enabling a system to change its organization without explicit external command during its execution time”. Geerlof and Beckhoven (2016) clarify that the concept originated in science, in particular physics, chemistry and biology. It is deep-rooted in the theory of complexity which originated in the field of physics. According to Del Val et al. (2014), to promote self-organization, a system is required to have some key features: 1) absence of external or central control, authority or supervision; 2) ability of the system to evolve; and 3) ability to deal with uncertainty. Del Val et al. (2014) elaborate that self-organization is a continuous process undertaken by individuals in the absence of central command. Individuals utilize locally collected data to take a decision whenever it is important to self-organize.

Chiles (2004) thinks that the idea of self-organization stems from the belief that individual actions can tremendously impact the whole population or group. Stevenson and Harmeling (1990) propose that this goes in line with the theory

of complexity which emphasizes that actions taken at difficult times by individuals may have dramatic consequences on the wider group as a whole. This is important as the final response is based on individual (e.g. employee- or unit-level) reactions in many cases. Di Marzo Serugendo et al. (2005) suggest two types of self-organizing systems, namely, strong and weak self-organizing systems. In strong systems no internal or external explicit control are exposed. Weak systems are those with internal control practiced over the process. Regardless of the presence/absence of control, the capability to reorganise work and continue operation is instrumental for any organization. Nan and Lu (2014) report that during Hurricane Katrine in 2005, ordinary individuals utilized the power of social networks and communication media and became influential in disaster response.

According to Schild and Bussmann (2007), to face the growing challenges change brought into the automobile industry, DaimlerChrysler led a consortium aiming at addressing these issues. As a result, a new self-organizing system was introduced where new multi-purpose machines were used. These machines could perform more than one function just by changing a tool. Thus, failure of a machine could easily be overcome. Ironically, all businesses want to stay operating forever, yet self-organization is still not a fundamental attribute in a vast number of organizations. This is why many firms encounter difficulties in the marketplace when change occurs. This attribute must be considered in all fields, aspects and industries. It is either to cope with change or suffer either immediately or in the medium and long run.

2.6.5.2 Creativity and Innovation

Demyen and Ciurea (2016) indicate that creativity has been present in management research since the middle of the last century. Raina (1999) states that creativity is defined as “A process of perceiving new relationships and new challenges, coping with changing situations, and expressing one’s unique perceptions and responses”. Woodman et al. (1993) show that creativity at organizational level is defined as “the creation of a valuable, useful new product, service, idea, procedure, or process by individuals working

together in a complex social system". Abdul Karim and Sarfraz (2016) point that creativity has two dimensions, novelty and usefulness. Bharti and Qureshi (2012) establish that creativity involves two processes: thinking and producing. Creativity has a wide scope (Demyen and Ciurea, 2016) and is applicable in all aspects of business and management. It is about taking risk and going beyond the boundaries (Friedman and Forster, 2001).

According to Perry-Smith and Mannucci (2017), creativity theorists emphasize the significance of introducing novel and useful ideas. Chua et al. (2015) claim that for creativity to be successful, it should be received by the audience, among other factors also. They argue that the culture of the audience affects the likely success of creativity. However, the audience can direct and focus the creative idea for better alignment. Mehta and Zhu (2016) indicate that research shows a negative relationship between availability of resources and creativity. However, this might not be the case in reality. Most innovations come from organizations rich in resources like Apple and Samsung, to name a few. An example of creativity would be the creation of a new product or a new use of an existing product to face a novel issue.

Innovation is defined as "the generation, acceptance and implementation of new ideas, processes, products or services" (Anahita et al., 2009 cited Thomson, 1965). Eisenhardt and Martin (2000) and Cardinal (2001) establish that with the rapid change in the business environment, innovation is looked at as a crucial competitive advantage. Damanpour (1991) suggests that innovation and change are tightly related. A 1995 OECD paper by Geroski demonstrates that innovative firms are less affected by pressures. Siguaw et al. (2006) indicate that innovation promotes capabilities within the organization and improves response to change. Zahra and Covin (1994) explain that innovation is a core element for survival and evolution. However, Cirani et al. (2016) show that there are many obstacles that countries, specifically developing, encounter in their surge for innovation. These include the technology gap, inefficiency, competition and fund allocation.

Rogers (1962) and Denning (2016) indicate the importance of communication as a means of ensuring the acceptance of presented innovation by decision-makers. Jain (2016) argues that though creativity and innovation are related, they are distinct. Innovation can use previous or existing ideas, but creativity is genuinely novel. Gupta and Banerjee (2016) stress the importance of individual creativity for an organization to be innovative. They explain that to gain a competitive advantage, both creativity and innovation must work together. Zuzul (2016) asserts that innovation results from the interaction among a group of experts from different backgrounds. Li et al. (2018) show that employee involvement is positively linked with innovation. Jain (2016) stresses that creativity is the most important component of innovation. As stated, both creativity and innovation are crucial for a resourceful organization. Add to that, creativity and innovation have to be leveraged through training. The collective creativity and innovation of the firm stems from that of its staff, when systematically nurtured and utilised. The two concepts are increasingly becoming integrated into management systems, like quality and risk management systems (e.g. Design for Six Sigma, FMECA, …etc).

2.6.5.3 Entrepreneurial spirit

According to Hisrich and Kearney (2012), entrepreneurship is defined as “the process of creating something new with value by devoting the necessary time and effort assuming the accompanying financial, psychic, and social risks and uncertainties; and receiving the resulting rewards of monetary and personal satisfaction”. Entrepreneurs seek to introduce new creative and innovative means for the creation of value. Martin (2010) mentions that “An entrepreneur sees an opportunity which others do not fully recognize, to meet an unsatisfied demand or to radically improve the performance of an existing business. They have unquenchable self-belief that this opportunity can be made real through hard work, commitment and the adaptability to learn the lessons of the market along the way”. Evans (1949) says that “Entrepreneurs…are those who organize, manage, and actively control the affairs of units that combine the factors of production for the supply of goods and services”.

Hisrich and Kearney (2012) reveal that corporate entrepreneurship is “the process by which individuals inside organizations pursue opportunities independent of the resources they currently control; this involves doing new things and departing from the customary to pursue opportunities”. Thornberry (2006) ascertains that by the end of the 1990s, corporate entrepreneurship emerged as a main trend. The concept of corporate entrepreneurship itself was introduced in 1985 by Gifford Pinchot. The whole notion was based on firms’ desire for their employees to act like entrepreneurs. This (entrepreneur-like behaviour) is important to adapt to changes and make the utmost out of new trends and technology. Denton (1993) suggest that those with an entrepreneurial spirit have a feeling of ownership in the business or organization.

According to Hisrich and Kearney (2012), social and corporate entrepreneurship have been present in the private, public, for-profit and non-profit organizations. It is not limited to a specific group of people or organizations. Corporate entrepreneurship gained more importance as businesses and consumers have become more dynamic. Thornberry (2006) claims that organizations with entrepreneurial spirit, especially in leadership, develop ability for survival. The absence of entrepreneurial perspective at leadership and management levels may lead to negative consequences in the volatile business environment of today. That is increasingly getting more important as innovation rate increases and cycle times decrease. According to Michael Cherock, CEO of AE Works, companies fall back after prosperity because they lack entrepreneurial spirit (Gest, 2016). In fact, this can be attributed to many factors, mainly the absence of innovation, yet entrepreneurship remains important. Hisrich and Kearney (2012) point that entrepreneurial spirit in an organizational context leads to the establishment of a new firm or development of innovation within the already existing context. Gradinaru et al. (2012) indicate that entrepreneurship is also an important source for employment. Thornberry (2006) confirms that this is gaining more attention as competition for jobs get fiercer. In this context, the focus is on development of existing firms, mainly through initiative-taking and innovation.

According to Thornberry (2006), entrepreneurial spirit brings in risk-taking, routine avoidance, opportunity-seizing and passion for improved performance. Add to that, entrepreneurial spirit is always focused on value creation and may seek resources from the outside when required. The entrepreneurial skills can be acquired through learning when real desire is there. Entrepreneurial mindset should precede the pursuit of entrepreneurial skills. This mindset includes qualities like: personal confidence and self-control, ability to work with uncertainty, readiness to hire smarter people than him/herself, passion for value creation, opportunistic character, urgency, determination, resilience, optimistic, humorous and inherent entrepreneurship in one's personality. According to Baron (1998), people with entrepreneurial spirit deploy their cognitive abilities to cope with uncertainty and pressure.

Osborne and Gaebler (1992) suggests that at country level, entrepreneurial governments encourage competition between product and service providers. They pass control to the public rather than keep it within the corridors of the decision-makers alone. Guzhva et al. (2008) conducted an empirical study to identify the financial benefits entrepreneurial spirit brings in to the US General Aviation airports using quantitative and qualitative data. This included interviews and discussions, beside a survey. Logistic regression was used to analyze data. The results indicate that airports managed by entrepreneurial managers had better financial resources and sources than the rest. Airports with entrepreneurial spirit are more likely to operate without external funding. In a resourceful context, entrepreneurial skills are vital as first-liners are the first defense system. They have to be able to contain the situation at least until support and better solutions arrive, whenever required. Leadership and management should exhibit entrepreneurial characteristics. This enables the firm as a whole to view business in a different approach seizing any opportunity for improvement. It creates an internal culture where ideas are encouraged, adopted and turned into reality.

2.6.5.4 Mindfulness

Vogus et al. (2014) show that an organization that always manages to go through tough times in a successful 'error-free manner' is known as a High Reliability Organization (HRO). Examples of such systems include nuclear power plants, aircraft carriers and hospital emergency units (Weick et al., 2004; Vogus, 2011). Weick et al. (2004) state that the concept of 'mindfulness' (vigilance) is a pillar in HRO. Mindfulness is defined as "a psychological state in which individuals engage in active information processing while performing their current tasks such that they are actively analysing, categorizing, and making distinctions in data" (Krieger, 2005 cited Langer, 1997). Brown and Ryan (2003) define it as "enhanced attention to and awareness of current experience or present reality". Brown and Ryan (2003) and Brown et al. (2007) clarify that the concept is rooted in the Buddhist philosophy where consciousness and awareness are educated. It is about the capacity to be both aware and conscious about the undertaken experience.

Brown et al. (2007) and Mazumdar (2014) agree that high levels of mindfulness show increased self-awareness. According to Weick and Sutcliffe (2006), the focus of mindfulness in the business environment is to establish a clear understanding of developing hazards and the factors that affect this understanding and go beyond the habit of having a set of expectations. This is extremely important as relying only on automation and modelling is in itself risky. Calculative and standardised risk management is a major source of debate as many events have shown its shortcoming. Farny et al. (2018) refer to mindfulness as the "collective alertness" among community members. It is a personal trait that can be acquired via training (Van De Veer et al., 2016) and that varies across people by nature (Brown and Ryan, 2003). Bashford (2012) demonstrates that many firms, including Google, London Business School and the UK Home Office implemented mindfulness programmes. Van De Veer et al. (2016) show that mindfulness is constructed around attention to the present/current experience. Brown et al. (2007) considers flexibility an important feature of mindfulness. Weick et al. (2004) hypothesise that

mindfulness is the production of five processes: a preoccupation with failure, reluctance to simplify, sensitivity to operation, commitment to resilience and deference to expertise.

Langer (1992) hints that mindful people use opportunities others are not aware of. Weick et al. (2004) assume that mindful organizations invest heavily in thought work to be aware of what goes around and stay alert. He elaborates that within organizations, mindfulness runs on two levels: individually, where people seek improvement on their personal level, and collectively, where people jointly work to improve the organization as a whole. Ensuring collective mindfulness is practised is vital for both efficiency and survival. Gartner (2011) claims that mindful organizations are always open to change. Ramiller and Swanson (2009) suggest that these organizations might set mindfulness routines that ensure continuous self-assessment. However, Khisty (2010) recognizes that mindfulness is a difficult practice that requires great patience and exercise. Reb and Choi (2014) report that engagement in mindfulness has shown positive impact on both the individual by, inter alia, reducing stress and the group by improving communication. Sun et al. (2016) add that mindful people are consciously paying attention to the experience and analysing it. They scan the surrounding environment processing information for enlightened decision making (Fiol and O'Conner, 2003).

Vogus (2011) gives an example from health care where enhanced mindfulness had led to improved safety and outcome quality. In a 2003-2004 study by Vogus and Sutcliffe, over 70 nursing units from 10 different US hospitals were investigated. The study reveals that the higher the level of mindfulness is the less medication errors are within a unit. Added to that, higher levels of psychological safety existed between nurses and their manager nurse under higher mindful settings. The idea of having people alerted and aware of the surrounding conditions is important. However, humans remain humans and this alertness should go through periods of passiveness or inactiveness. Therefore, it is important to have systems in place to ensure being vigilant to the experience. These may include

discussion sessions, checklists, control charts or any other form of detection techniques. Additionally, being mindful (vigilant) does not mean building a totally negative attitude toward risk. Being completely risk averse can cause negative consequences (e.g. missing opportunities for development and profit). Hence, evaluating perceived failure should aim at both survival and development.

2.6.5.5 Loose-coupling

In Normal Accidents, Charles Perrow sheds light on a very important aspect an organization needs to take account of when designing a system, 'coupling'. Perrow (1984) explains that coupling originated within sociology in the 1970s. According to Perrow (1984) and Pancs (2016), coupling refers to the nature of the interdependencies between the different parts (units) of a system. The connections might be tight or loose based on how the system was initially designed. In tightly-coupled systems, elements are very dependent on one another with tight proceduralization and monitoring in place. This means that the interdependence between the units is very strong. Thus, the failure of a single unit may cause other units to stop also.

On the other hand, in loosely-coupled systems, there is little or even no interdependence between the different units with flexibility in place. The units here do not have to be operated under one standardized code of rules or guidelines. Weick (1976) clarifies that the processes work and respond as a system, yet each has its own separate 'identity'. Note that coupling refers to the various levels of relations and interdependences within a system and between the system and the industry or environment around (see Table 2.1). A system may be internally characterized as loosely-coupled, while at the same time be tightly-coupled to external elements. This is when internal processes are independent and separated, yet the system as a whole is tightly-coupled to external factors like government regulations or sector practices. Also, coupling can be timely based on factors like season and project-based initiatives. Finally, a system might be 'decoupled' when no

relation or interdependency with a particular aspect exists (i.e. regulations), describes Tilcsik (2010).

Table 2.1: Tight and loose coupling.

Coupling	Characteristics
Tight	• Time-dependent processes (the product/service line moves continuously). • Process sequence is fixed. • Centralized. • Overall goal achieved through one way only. • Just in time resource management. • Changes can be very costly. • Few substitutions possible. • Responsiveness.
Loose	• Standby mode possible. • More flexibility with sequencing. • Decentralized. • More than one way toward achieving the goal. • Availability of resources (slack). • Changes are easily implemented. • Many substitutions possible. • Responsiveness and distinctiveness.

Source: Perrow (1984) and Douglas and Weick (1990).

Weick (1976), Perrow (1984) and Pancs (2016) agree that loosely-coupled organizations are more adaptable to changing environments. A unit of the system can be readjusted and modified while keeping the organization intact. Weick (1976) adds that loosely-coupled organizations are capable of encountering and surviving a wider range of changes. On the other hand, Perrow (1984) shows that while loose-coupling allows space for manoeuvrability, tight-coupling does restrict such action. However, different environments may require a different type of coupling. For example, continuous processing lines, like a medical drug plant, need tight-coupling as resources are allocated efficiently and in a strict manner. Standardized

responses are immediately introduced in case of any deviation. In loosely-coupled organizations, like an assembly plant, different sections handle different parts with different processes. That is done with minimal interdependency between sections and processes. Though the concept of coupling might be a source of debate, it looks closer and more relevant to resourcefulness.

2.7 Quality Management

Unlike resilience, the concept of quality management[2] has been around for a long time. Every aspect relating to it has been subject to close examination and review. Kemp (2006) demonstrates that when tracing the development of the quality movement, the establishment of standards is the cornerstone leading to today's quality achievements. Since the days of Hammurabi, standards have existed whether in the form of legal codes, medicine instructions or rules of business. However, industrial standards came to existence in the 19th century during the American civil war. In the battlefield it is a matter of life or death where every component of weapon is vital. Guns were made separately with unique parts that fitted together. Each gun if broken needed to be repaired by a skilled gunsmith at a factory for parts of other guns would have most probably not worked. Thus, the idea of standardization emerged. The military looked for easily replaceable parts, so parts of other pieces could be used, or spare parts could be taken to the battlefield. Furthermore, the parts should have been identical even if coming from different suppliers. This was solved with the idea of specification, determined targets and tolerances, adding consistency to products (Evans and Lindsay, 2011).

According to Kemp (2006), to identify that the product or service meets the identified standards, inspection, examining and comparing product attributes to specifications, was used. Each single product would be inspected and those

[2] Quality Management is defined as "All activities of the overall management function that determine the quality policy, objectives, and responsibilities and implement them by such means as quality planning, quality control, and quality improvement within the quality system", (De Feo, 2017).

identified as defective would be sent for rework or discarded. Inspection is referred to as the first quality management paradigm. However, with the introduction of mass production, inspection became inapplicable as it required long time and huge efforts. Shewhart's statistical methodology known as quality control used statistical sampling to examine part of the products with confidence that the entire quantity meets the set specifications (De Feo, 2017). The quality control process included the core processes in the production or service line. Loffler (2001) explains that quality control is the second quality management paradigm. The third paradigm is quality assurance where in the 1950s of the last century the focus was shifted to include other non-core activities, to the process rather than the product. Toward the end of the 1970s, a new quality approach was introduced known as Total Quality Management (TQM), which is the forth paradigm. This approach went beyond the boundaries of the firm to include customers, suppliers and other partners. This particular philosophy is considered the driving force that enabled Japan to dominate the electronics and car making industries in the 1980s and 1990s. Boulter et al. (2013) confirms that TQM-based quality award winners are achievers of highest performance level.

Over the past years, several quality approaches, methodologies and techniques have come to existence, i.e. Toyota's Kaizen and JIT, Motorola's Six Sigma, besides QFD, FMECA and other techniques, demonstrating the never-ending cycle of improvement quality brings along (Graham, 1988; Gambi et al., 2015). For example, Levine and Toffel (2010) hint that firms with ISO certification (a quality assurance framework) show much better performance compared to non-adopters.

2.7.1 ISO 9001 Standard

According to ISO (1997; 2016), during the conference of 'national standardizing organizations' in 1946, which took place in London at the Institute of Civil Engineers between October 14th to 26th, the International Organization for Standardization (ISO) was established in the presence of 65 delegates from 25 countries. The ISO body came as a result of a merger

between two organizations, namely, the International Federation of the National Standardizing Associations (ISA) and United Nations Standards Coordinating Committee (UNSCC). The first was established in New York in 1926 while the other was established two years before the establishment of ISO. ISA was run from Switzerland while UNSCC was run from London. The establishment of ISO was 'to facilitate the international coordination and unification of industrial standards' (ISO, 1997; Goetsch and Davis, 2014; ISO, 2016).

A year later, ISO became officially active with 67 technical committees working on specific fields from its elected headquarter, the Swiss city of Geneva. However, at the beginning ISO took part in seminars on 'testing and quality control'. The organization started its own programme in this field in 1978 when a committee for 'Quality Management and Quality Assurance' was established. This came following a proposal by the Director-General of the British Standards Institution. This paved the way for the eventual introduction of the globally known ISO 9000 standard (ISO, 1997; 2016).

2.7.1.1 ISO 9000

ISO 9000 is a series of standards concerned with quality management systems introduced first in 1986, according to the British Assessment Bureau (BAB) (BAB, 2016). The ISO 9000 standard specifies the requirements of a quality management system[3] (QMS) (ASQ, 2016). It is a quality assurance system. According to the 7th edition of Juran's Quality Handbook (2017), the ISO standard specifies the minimum requirements for a quality management system. Castka et al. (2015) explains that the standard certification process is a 'multi-tier governance' that involves four main groups of players: organizations seeking certification, certification bodies and auditors, accreditation bodies, and the standard setting body. According to Albuquerque et al. (2007) and ASQ (2016), when a firm/organization is ISO

[3] A QMA is "A formalized system that documents processes, procedures, and responsibilities for achieving quality policies and objectives", (ASQ, 2019).

9000 certified, it indicates that it has a consistent quality management system that keeps good recording of the quality-related issues. This shows firm's ability to consistently meet the requirements of its customers. It is important to note that ISO 9000 does only refer to the quality management system. It does not indicate anything about the quality of the product itself. So far, five versions of ISO 9000 standard have been issued since the launch of the first version in 1987 (BAB, 2016). The evolution of the standard has led to the inclusion of new industries, refinement in the standard's requirements and response to the expectations firms looked for as a result of changing environments.

2.7.1.2 ISO 9000:1987

Stevenson and Barnes (2001) suggest that with the aim of establishing global standards to externally assure the quality of quality management systems, the first version of the ISO 9000 standard was launched in 1987. Bamford and Forrester (2010), Goetsch and Davis (2014) and BAB (2016) reveal that the standard had an evident British influence, as it had the same structure of the UK BS 5750 standard by the British Standard Institute (BSI). BAB (2016) points that the standard was also affected by military standards, in particular US military standards, which made it more suitable for manufacturing, focusing on conformity of outputs. Gupta and Pongetti (1998) maintain that in its early stages, only European agents sought ISO 9000 certification, but later, it turned into a global phenomenon. Goetsch and Davis (2014) claim that the version necessitated large amounts of paperwork firms needed to present as evidence of compliance.

2.7.1.3 ISO 9000:1994

Though, this edition did not bring in a major change, it attempted to move from the quality control manufacturing mindset at the time toward quality assurance. Beside compliance with the proceduralized documentation, there was a focus on preventative actions to achieve assurance (West et al., 2012; Goetsch and Davis, 2014; BAB, 2016). However, Bamford and Forrester (2010) and Javier et al. (2014) indicate that this edition did not include explicit

reference to continuous improvement. Tsim et al. (2002) argue that the main focus of this standard was the prevention of nonconformity as a means to achieve customer satisfaction. Santos and Escanciano (2002) show that the standard was criticized for, among others, bureaucracy, narrow scope and excessive documentation. Ironically, all versions of the standard have received the same criticism in relation to documentation, even the most recent ones.

2.7.1.4 ISO 9001:2000

According to Martinez-Costa et al. (2009), this version was a big change in the ISO 9000 philosophy. Process management, customer satisfaction and continuous improvement had more emphasis. Documentation was reduced as the goal was to prove the smooth flow of the system, keeping documentation as a means not a goal. Bamford and Forrester (2010) explain that the major changes in this version were the introduction of continuous improvement and resource management. Add to that, the system approach was adopted in this version. A set of new quality management principles were introduced in this issue to function as a foundation for the quality management related standards (BAB, 2016). Goetsch and Davis (2014) verify that the version introduced performance metrics as a means to improve effectiveness. Alfonso et al. (2006) and Martinez-Costa et al. (2009) hint that research indicates that this version of the ISO 9000 standard demonstrated more implementation of TQM concepts than the previous versions.

2.7.1.5 ISO 9001:2008

This edition presented some slight modifications that aimed at clarifying the requirements already in place and making the standard more consistent with other standards (BAB, 2016). Furthermore, Abdul Samat et al. (2012) explain that the 2008 revision aimed at making the standard compatible for all organizations, regardless of size. Ismyrlis et al. (2015) affirm that this fourth edition was more customer-focused and generic, designed for both the manufacturing and service industries. Heras-Saizarbitoria et al. (2011) demonstrate that as a result of this reviewed version, the application of the

ISO 9001 standard boomed in the service sector with education, social activities, the tourism industry, and the public and social services being in the lead.

2.7.1.6 ISO 9001:2015

This is the most recent issue of the standard that keeps it up to date with new quality management practices (West and Cianfrani, 2016;BAB, 2016). West and Cianfrani (2016) and ASQ (2016) explain that this version includes changes that consider the volatile changing business environments organizations have to work in. The standard is the first in the series to explicitly and directly address risk through risk-based thinking. It systematically explores the strengths, weaknesses, threats and opportunities a system may encounter. Murray (2016) confirms that preventive action to addressing risk has become part of 'strategic and operational' planning in this edition, integrating risk-based thinking with the Plan-Do-Check-Act (PDCA) cycle, also known as the Deming cycle in quality.

2.7.2 Quality Management Principles

No doubt, to successfully implement a quality management programme, an organization should successfully implement the principles the programme is based on. According to ISO (2012), the ISO 9000 standard is based on eight quality management principles developed by international experts, namely, Customer Focus, Leadership, Involvement of People, Process Approach, System Approach to Management, Continual Improvement, Factual Approach to Decision Making, and Mutually Beneficial Supplier Relationships. The principles can represent a framework for performance improvement in organizations. Hoyle (2009) says that the principles might be used in process-design validation, decision validation, and system and process auditing. This section presents an overview of these principles.

2.7.2.1 Customer focus

One of the fundamental principles of the quality movement has been customer focus. ISO (2012) emphasises this principle pointing that the existence of

organizations depends on their customers. Thus, customer needs - present and future needs - and requirements should be understood and met, and expectations exceeded. This might include researching customer needs, measuring customer satisfaction and systematically managing customer relations. Abdul Samat et al. (2012) point that firm's policy and objectives should reflect understanding customer needs. According to BAB (2015), customer focus increases customer satisfaction and loyalty, increases revenue, and reduces waste. Customer centricity should focus on value as transactions are value-based. Both the customer - beneficiary - and organization seek value.

2.7.2.2 Leadership

BAB (2015) indicates that a business would struggle if no clear and strong leadership is in place. For ISO (2012), leadership provides an organization with a unified direction toward determined goals. It also establishes an enabling environment that fully engages people to realize the set objectives. This includes setting a clear vision, spreading trust and eradicating fear, and inspiring contribution. BAB (2015) suggests that leadership results in better employee engagement, higher motivation and improved productivity. A major emphasis should be leading by example, which is missing in the standard.

2.7.2.3 Involvement of people

ISO (2012) considers people to be the essence of the organization. The standard assumes that the full capacities of people are realized when people are fully engaged. The implementation of this principle can lead to, inter alia, ability for people to identify obstacles to their performance, self-evaluation and assessment against pre-set personal objectives, and free-sharing of expertise among people. Abdul Samat et al. (2012) stress involving people in the ISO standard implementation process. BAB (2015) argues that applying this principle increases motivation, triggers innovation and improves productivity. Employee empowerment should also be a requirement to ensure faster results, especially in difficult times.

2.7.2.4 Process approach

ISO (2012) maintains that managing activities and resources in a process approach leads to more effective results. The implications of applying this principle include creating clear responsibility for activity management, measuring activity capability, and risk and impact evaluation on relevant and concerned parties. BAB (2015) points out that process approach eradicates waste, reduces cost, and enhances consistency and continuous improvement.

2.7.2.5 System approach to management

ISO (2012) states that a system approach to management creates a more efficient and effective organization. This means recognizing, understanding and handling interconnected processes as a system. Adopting this approach should lead to restructuring the system for the most efficient and effective performance, understanding interdependencies in the system, and continuously improving the system. BAB (2015) confirms that the application of this principle increases efficiency. The aim here is to keep an eye on the overall system, while monitoring processes at the same time.

2.7.2.6 Continual improvement

ISO (2012) deems continual improvement important for total performance. The standard calls to adopt continual improvement as a permanent objective for the organization. ISO perceives that the application of this principle leads to, inter alia, deploying a continual improvement approach across the organization, training people for continual improvement techniques, and identifying and recognising improvement. According to BAB (2012), continual improvement leads to more flexibility, promoted performance and adaptation to new realities. By continuously improving (a practical approach), people gain valuable knowledge and expertise, which can be of great use during difficulties.

2.7.2.7 Factual approach to decision making

ISO (2012) maintains that effective decision-making requires data-analysis and information. According to ISO, this principle leads to providing access to data when needed, using valid analysis methods and making evidence-based decisions - this includes using experience and intuition in the process. BAB (2012) introduces two benefits for the implementation of this principle: better understanding of the business environment through collected data and ability to justify decisions when required.

2.7.2.8 Mutually beneficial supplier relationships

ISO (2012) considers mutually beneficial relations between organizations and suppliers a source of enhancement for value creation. This is basically because both organizations and suppliers are interdependent. According to ISO, the application of this principle leads to positive results, including, open communication, information-sharing and setting co-operative development activities. BAB (2015) explains that this principle leads to promoting long-term relations, optimized cost and capital, and flexibility when faced by changes in the market or customer needs. External partners should be considered resources an organization can mutually capitalise on.

2.7.3 ISO Implementation

Ching and Woan-Yuh (2008) affirm that worldwide many organizations observed various benefits after the implementation of the ISO 9000 standard, while many others failed to see any benefits. Alfonso et al. (2006) establish that away from the belief that ISO 9000 directly brings in success, the standard is just an important step toward the development of an effective quality management system. The proper use of the implemented quality management system is the best means to achieve any perceived benefits. According to Zelnik et al. (2012), practice has proved that achieving certification does not achieve the final purpose, be it financial or other. In fact, it paves the way for further, perhaps breakthrough, development of the QMS (Zelnik et al., 2012). However, with ISO being a quality assurance system, it

is not expected to have breakthrough developments as a result of its implementation, though, it remains possible. The main focus is conformance to standard. Psomas et al. (2010) ascertain that ineffective implementation of a QMS is a reason for not achieving desired results.

Ghatavi (1994) suggests that effective implementation of ISO 9000 stems from firms' deep understanding of their core processes, where they fully grasp how information is integrated into the final product or service. Thus, the requirements for meeting quality in critical activities must be well understood. A 1995 study by Taylor that covered different industries shows that only 7% of the participating firms considered ISO 9000 as a strategic option within quality management. A similar study by Williams (2004) argues that the same applies to the sample of his study. Douglas et al. (1999) believe that the forced acquisition of the standard is more likely to produce negative attitudes among management and employees. This is because social aspects go in line with technical aspects and ignoring them could backfire. Goetsch and Davis (2014) explain that when adopted because of external pressure only with no real internal motivation, ISO 9000 might turn into a burden which might negatively affect the organization. A survey by Williams (2004) on 5 US firms from different industries supports this argument as the highest scoring in terms of benefits are firms that implemented ISO 9000 for quality improvement, while those forced to do scored the lowest points in terms of benefits.

According to Rusjan and Alic (2010), when a company introduces a QMS with internal motivation being the driver for that, it seeks a level of effectiveness and efficiency beyond what is required by the ISO 9000 standard requirements. It also pursues continuous improvement organization-wide. Rusjan and Alic (2010) hint that both the requirements of the 1994 and 2000 versions of ISO 9000, when grasped and implemented appropriately, reduce bureaucracy and introduce an 'innovative' way for the development and implementation of the QMS. This in turn improves output quality and organizational performance. A number of studies have come with Critical

Success Factors (CSF) for the effective and successful implementation of the ISO 9000 standard within different organizational contexts.

Psomas et al. (2010) conducted an empirical study on 93 Small and Medium Enterprises (SMEs), using a questionnaire filled by quality managers. The study aimed at identifying the CSFs required for the effective implementation of ISO 9001:2008 in the Greek service sector. The findings reveal that complying to the standard's minimal requirements is not enough for an effective implementation. The study concludes that companies' internal motivation, attributes, employee attributes, alongside the quality system requirements and external environment characteristics must be met to achieve effective implementation. In an empirical study to identify the CSFs and issues related to the maintenance of ISO 9000 during and after the certification period, Wahid and Corner (2009) interviewed 14 people from top, middle and lower management responsible for operations and quality, and those in charge of ISO 9000 implementation in a construction company in Malaysia. The researchers conclude that top management commitment, employee involvement and participation, teamwork, continuous improvement, reward system, understanding of ISO 9000, measurement of performance, and communication are the CSFs for the effective implementation of ISO 9000.

Patil et al. (2012) held a pilot survey involving 20 Indian firms from the construction industry. The survey aimed to investigate the CSFs that have influence over the effective implementation, operation and continuous improvement of a QMS. The results show that the most influential factors are employee empowerment by top management, top management taking care of employee wellbeing, top management always updating employees' knowledge, employees are trained on job-related skills and total quality concepts. In an empirical study using survey questionnaires to examine how Taiwanese businesses implemented ISO 9000 successfully, Ching and Woan-Yuh (2008) find that top management support, quality planning, employee involvement and continuous improvement are key for the effective

implementation of the standard. Furthermore, the study indicates that these factors are sequential rather than being thought of as parallel.

The discussion over the implementation of the ISO 9001 standard reveals the central role organizational structures play. The structure seems to determine both the success of the implementation and its outcomes. Hence, the next section addresses organizational structure in more detail.

2.8 Organizational Structure

Organizational structure concerns the assignment and division of roles within organization, and the interactions between horizontal and vertical groups (Gulati and Puranam, 2009; Jarzabkowski et al., 2016). With the evolution of organizational theory, organizational structures have also evolved over time. Different organizational structures bring various benefits to the organization. This part addresses two organizational structures, routine-based and process-based structures, in further details.

2.8.1 Routine-oriented organizational structure

Hammer and Champy (1993) point that routine or organizational routine was first introduced by Edwin O. Stene in 1940. He defined it as the “part of any organization's activities which has become habitual because of repetition and which is followed regularly without specific directions or detailed supervision by any member of the organization”. This structure is an extension of the innovatory realisation of Adam Smith in 1776, who proposed the breaking up of work into smaller and simpler tasks (Smith, 1962). Here, no perception is required as tasks are performed habitually in a more mechanical manner. It is worth noting that even routines involve a certain amount of awareness, otherwise no productivity would be observed. Cyert and March (1992) introduce three possible outcomes for proceduralization, specifically, avoidance of uncertainty, preservation of rules and maintenance of simplicity. These outcomes come as a result of a firm’s objective from the implementation of certain procedures. Gersick and Hackman (1990) propose

that routines are characterized by: 1) repeatability, 2) similar functionality, 3) pattern of behaviour and 4) a given situation.

Stene (1940) argues that routine does not hinder initiatives and mental efforts. He believes that for a worker to become creative in his work, he needs first to master the practical dimensions. He thinks organizations may adapt to new routines (change) in their pursuit of organizational objectives. Thompson (1967) indicates that routinization or proceduralization is a source of stability for an organization. Nelson and Winter (1982) argue that routines are a desired norm within an organization to resist undesirable changes in the system that might be caused by the environment. They add that routines play an important part in the acquisition of knowledge and skills in the organization, noting that people learn by doing. They also argue that routine is important to have control over processes by keeping the production processes homogeneous. Gersick and Hackman (1990) indicate that routine behaviour is a source of efficiency with time and energy saved, since no planning or strategy setting is required for the performance of the job. Follett (1996) argues that proceduralization contributes to the overall good of the organization, despite compromising individual benefit in some cases.

In a case study by Adler et al. (1999), 60 interviews were held with 60 differently ranked employees of a Toyota subsidiary in USA. The aim of the study was to conceptualize the relationship between efficiency and flexibility. The results show that ‘metaroutines’ - routines set to change other routines - facilitate efficiency in the performance of nonroutine activities. Adler et al. (1999) note that workers kept working on routine tasks that were temporally separated from nonroutine work. The structure also proved important in facilitating parallel work on both routine and nonroutine work in different units. It is worth noting that in the Toyota way (Lean) of work, routines are patterns that involve high level of awareness both at the individual and group levels. Feldman (2000) held a longitudinal study where 20 unstructured interviews with people from a housing organization, plus 1,750 hours of observation took place over four years. The researcher concluded that routines like any other

organizational element can change and improve over time. The organizational setting in the studied environment supported change. In a literature-review, Feldman and Pentland (2003) argue that routine can be a source of variety, when both the ostensive, idea, and performative, action, of routine are taken in account. By focusing on the performative aspect, routines can be changed and improved. It seems the discussion concentrates on routine as a procedure rather on routine as a culture, which has different implications. At the end, certain procedures should be followed to perform any tasks.

On the other hand, Stene (1940) warns that routine does not always promote coordination of activities. It is also limited to regular repetitive activities, for they are more likely to be useless during abnormal situations. Nelson and Winter (1982) explain that routines might hinder flexibility and change as proceduralized behaviour might become so inherent that it resists change. They also cannot be applied to all organizations, for example, R&D firms which are change-centred. This means a change in a machine or behaviour might take longer time to be acquired due to resistance to change in the system because of routinization. A 1984 conceptual study by Hannan and Freeman (1984) concluded that routine causes structural inertia. This in turn minimizes firms' ability to successfully survive when faced by adverse conditions or difficult times. In a theoretical paper, Weiss and Ilgen (1985) show that what they called 'routinized behaviour' leads to several negative consequences. Routinization reduces both awareness of the surrounding environment and the responsiveness of the system. It leads to not considering alternative approaches that might be required at specific points to face emerging threats.

Gersick and Hackman (1990) argue that routine behaviour turns into inflexible mindless actions with time. They might govern the group of people following the routine, while the opposite should be the case. They refer to the Florida Flight 90 tragedy in 1982. The plane crash was caused by the routine 'mindless' checklisting the pilots performed. They confirmed that the engine anti-ice system was off, which must have not been so in snowy weather, but

coming from a warm region, they repeated a routine check. Unfortunately, 79 people were killed in the crash. Gersick and Hackman (1990) also argue that routine behaviour can lead to failure or dysfunction when the environment changes, while actions remain the same. Contingency situations can be difficult to handle for staff used to handle routine work. They also suggest that routine might lead to reduced innovation with time, as little or no cognitive work is required. As a result, participants turn into passive contributors in terms of innovative initiatives. Davenport (1993) indicates that procedure-orientation lacks cross-functional and cross-organizational attributes, making the flow of information within the system ineffective and inefficient. Hammer and Champy (1993) suggest that US procedure-based firms lack flexibility, responsiveness and customer focus. This gave Japanese firms like Mazda the upper hand against US firms like Ford.

It is crucial to differentiate between the procedure-based structure and its standardized procedures, and specific operating procedures. Cyert and March (1992) describe specific operating procedures as detailed instructions set for the performance of routine activities. These are part of almost all organizational processes including those not routine-based. These normally change depending on the nature of the process or the practices in use. Surgical operations are good examples, as procedures aim at both reducing risk and, improving effectiveness and efficiency. They change depending on the specific diagnosed condition of the patient.

2.8.2 Process-oriented organizational structure

According to Hammer and Champy (1993), procedure-based organizations were mostly incorporating the principles of Adam Smith, dividing work into smaller tasks to realize better results. The approach worked well at the time; however, with the increase in the number of simplified tasks, processes became very complex. Thus, the management of these processes became complicated and very difficult. A winning strategy at a point might turn into a losing one at some other point, so no one single strategy can be used forever as a winning bet. Argyris and Schon (1996) say that the introduction of

process-orientation into organizational structure triggered changes at all strategic and managerial levels within organizations. Davenport and Short (1990) agree that the quality movement revolutionized organizational structures shifting the focus from the traditional task thinking to process thinking. According to Vera and Kuntz (2007), by the 1990s, process-oriented organizational structures became of great interest to both theorists and practitioners worldwide. The main notion is that when organizations are centred around their core processes, cost reduction and quality enhancement are realized.

Hammer (1996) demonstrates that process-orientation 'reversed' the industrial revolution by putting the parts the revolution decomposed together again. Hinterhuber (1995) reveals that in process-orientation, suppliers and customers are involved through a horizontal organizational structure that enables open communication. Hammer and Champy (1993) noticed that some firms managed to introduce a breakthrough improvement to their performance. Close examination revealed that these firms introduced major or wide-ranging change to their processes. Hammer (1990) and Davenport and Short (1990) explain that this was known as 'business process reengineering', where a radical change is introduced, as opposed to the traditional incremental change approach. This was driven by customer demand, competition and finally the endlessly changing business environment. Unlike the task-centred separated job descriptions in routine-based structures, process-based structures are cross-functional and centred around the outcome. Here employees are empowered to handle a complete transaction.

Hammer (1990; 2007) confirms that change should not be restricted to processes themselves, all organizational aspects related to processes must be affected and aligned with the new system. This includes training, work flow, sequence, etc. According to Hammer and Champy (1993), under process orientation 1) work units are replaced by process teams, 2) jobs changed from simple to multidimensional, 3) people are empowered to make decisions on

their own, 4) education replaces training, 5) focus shifted from activity to results, 6) advancement becomes based on ability rather on performance, 7) productive values take the place of protective values, 8) managers become coaches not supervisors, 9) flat organizational structures replace hierarchical structures, and 10) executives embrace leadership.

Hammer and Champy (1993) and Davenport (1994) argue that Information Technology (IT) played an important role in facilitating and enhancing the process-based organizational structure. It enabled firms to move from the specialist to the generalist employee perspective. Vanhaverbeke and Torremans (1999) explain that the transformation to a process-oriented organization begins with the identification of an organization's key processes, which vary based on industry and the organization itself. Then the system is redesigned around these processes. Process-centred structures improve firms' ability to cope with emerging hazards and complexity in the business environment. This is an important aspect for resilience, especially to be considered before implementing quality or risk management systems.

According to Hammer and Champy (1993), IBM Credit Corporation, a subsidiary of IBM, witnessed incredible outcomes when it implemented the process-oriented approach. Its ability to handle deals increased 100 times, using the new process thinking alongside computerized systems. Cycle times were reduced to one tenth in comparison to the previous time. Davenport and Nohria (1994) report that at Pacific Bell telephone service provider, an order had to go through 11 jobs and 5 working days. After implementing a process-based system, service was provided using one job within a maximum of 2.3 days, with 80% of orders delivered on the same day. The Internal Revenue Service managed to improve both productivity and employee satisfaction following the implementation of a new process-based system for tax collection. In a case study by Ongaro (2004), process orientation was introduced to an Italian public service. The results showed improved cycle time from 150 to 90 days. Quality of contact with customers also improved in terms of timeliness and completeness of information presented to customers.

Hammer and Stanton (1995) say that AT&T turned a big loss into a big profit through business reengineering, where process-oriented approaches were devised. Armistead and Machin (1998) carried out a case study on the government-owned UK Royal Mail which embraced TQM in the early 1990s. TQM is a process-based quality management framework. The results indicate improved productivity. Forsberg et al. (1999) conducted an empirical study using a survey on a number of Swedish organizations from different backgrounds (public and private, small and large manufacturing and service organizations). The aim of the study was to investigate the impact of process-orientation on these firms. The results show that process-orientation has a positive impact on all the studied dimensions. These include cooperation, cost, customer-orientation, lead-time, standardization, learning abilities and holistic view. Hertz et al. (2001) performed a case study on the Swedish automobile company, Volvo's, strategy. The adoption of the process-oriented structure improved sales, market share, profitability, lead-times, delivery precision and customer satisfaction. Silvestro and Westley (2002) carried out a latitudinal case study using semi-structured in-depth interviews with 20 people (managers and staff) from two UK based organizations. The firms came from different backgrounds, an electronics company and a large retail firm. The results show that market responsiveness was improved, cooperation between functions was enhanced and alignment of the firm's objectives promoted.

Vera and Kuntz (2007) investigated, theoretically and empirically, the feasibility of implementing a process-oriented organizational design in hospitals. Data came from a database of a German state and from a questionnaire sent to 192 CEOs of hospitals within the state. The result indicates that high level of process-orientation within hospitals leads to moderate but significant positive impact on efficiency. Peter and Klaus' (2007) case study on a Swiss bank explores the effect of process reengineering and process-based IT on overall quality. The results show improvements in terms of cycle time, reliability and process-related performance. Skrinjar et al. (2008) empirically investigated process-maturity level and its impact on financial and

non-financial performance of organizations among 405 Slovenian and Croatian organizations. The researchers used a questionnaire sent to CEOs and chairpersons. The results indicate that higher level of process-orientation directly enhances non-financial performance and indirectly improves financial performance. An empirical study by Kohlbacher and Reijers (2013) used interviews from a random sample of 132 Austrian manufacturing firms. The study aimed at exploring the relationship between process-orientation and performance. The results show that process orientation is positively related to organizational performance.

On the other hand, Hammer and Champy (1993) claim that 50% to 70% of the organizations that undertooke redesign toward a process-oriented structure failed in the early 1990s. Hammer and Stanton (1995) believe the high figures of failure reflect the difficulty of moving from the old prevailing approach to the emerging process-oriented approach. Again, the main source of failure has been ignoring the social aspects in the transformation. Vanhaverbeke and Torremans (1999) argue that processes cannot be the only basis for organizational structures. They point out that functional skills and product/service management are integral also. Added to that, not all activities undertaken within a system can be aligned with the process approach. Hammer (2007) reveals that hundreds of firms that followed the process-based approach made little or slow growth. He admitted that the process-orientation journey is hard and needs huge efforts. Silvestro and Westley (2002) found that process orientation brought in some negative effects, namely, replication of expertise, increased complexity, higher costs, horizontal silos, inconsistent functional decisions, and declined efficiency of the operations network. As for the time being, there is a consensus among quality practitioners on the central role of process-orientation for successful implementation of QMSs (De Feo, 2017).

2.8.3 ISO 9001 Structure

From the very beginning, the quality movement has been constructed around process-thinking principles. Edwards Deming, the father of quality,

emphasized in his 14 points both continuous improvement, involvement of people, education, communication and cross-functionality (Deming, 2013). Another prominent quality guru, Joseph Juran, embraced similar principles urging the need for communication, continuous improvement and training in his famous trilogy (Quality Planning, Quality Control and Quality Improvement) (De Feo & Juran, 2012). Philip Crosby, the developer of the zero-defect concept, also stressed cross-functionality, training, education, communication, continuous improvement and involvement of employees (Crosby, 1979). Armand Feigenbaum, who first introduced Total Quality Control, highlights that involvement of employees, teamwork, continuous improvement and engagement of customers and suppliers are essential for quality management (Feigenbaum, 1983). The Japanese quality guru, Kaoru Ishikawa, emphasizes process-thinking in his approach to quality. He endorses continuous improvement, employee empowerment, communication and cross-functionality (Watson, 2004; Goetsch and Davis, 2014).

Seddon (2000) and BAB (2016) agree that the first two versions of the ISO 9000 standard started as inspection tools leading to high levels of bureaucracy. The focus was control within certain types of organizations, mostly manufacturing. Firms needed to prove that they did what they said. This led to large amounts of documentation and documents that turned into a burden. Seddon (2000) indicates that the standard received a lot of criticism, especially, as it did not impose improvement as a requirement. In fact, the functional structure, routinization, had its shadows on the standard as it was built on the basis of the British ‘BS 5750’ standard. The 2000 issue of ISO 9000 was a major review refocusing the standard to better respond to the needs of organizations as a tool for improvement. It reduced documentation and centred the standard around process-orientation, a core concept of the quality movement. Continuous improvement became a main principle of the standard, beside involvement of people and engagement of partners, which are main principles of the process-oriented organizational structure. Also, prevention of problems replaced the traditional corrective concept within the previous version. The next two reviews, though not big, continued to move the

standard toward TQM principles. West and Cianfrani (2016) and ASQ (2016) point that the most interesting thing in the ISO 9001:2015 version is the explicit introduction of risk-thinking.

2.9 Discussion

The conversation above reviewed the relevant literature in relation to resourcefulness, ISO 9001 and organizational structure. The literature on resilience and resourcefulness focused mostly on reciting the benefits of the concepts, mainly in isolation from management systems. This restricts having deep understanding of resilience and limits its applicability. Similarly, the discussion over ISO 9001 standard lacks evidence on its implications for resilience/resourcefulness. Also, the role of the organizational structure in the relationship between quality management systems (ISO 9001) and resilience is not tackled sufficiently. Thus, the research proceeds with the aim of filling these gaps.

The human experience shows that nothing is more constant than change itself. With the world being so 'tightly-coupled' in some areas, the effects of unexpected scenarios may go far beyond the expected. The US mortgage crisis in 2007 caused a global recession that lasted for years. At a country level, growing challenges faced by organizations create more battle for resources. In difficult times, less resources need to be used to operate. The Oman Ministry of Education (MoE) has invested in quality management over the recent years. The Ministry was successfully ISO 9001:2008 certified in 2014. The main aim is to improve the outcome of the educations system. However, the biggest challenge the Ministry faces is resource-scarcity. As a result of the decline in oil prices[4], the country had to cut expenditures. This includes the entire public sector, with education having the lion share in the budget. This raises questions on the capability of the public sector to cope with the new situation, more importantly, on the effect of the quality initiatives

[4] The decline in oil prices has caused serious problems for all oil-producing countries, including Oman. This in turn has impacted financial allocations for Education. This situation is referred to throughout the thesis as financial crisis or difficulty/crisis. In Chapter 4, participants also refer to it in a similar way.

undertaken, mainly the ISO 9001 standard on the ability to deal with difficulties. Hence, the impact of the ISO 9001 standard on organizational resilience is of utmost importance for the entire public sector.

It is evident through the arguments in previous sections that to realize the benefits of ISO 9001, an organization needs to effectively implement the standard. This entails the implementation of the quality management principles the standard embraces indeed, within an enabling environment. As Donald Schon, from MIT, says an effective professional does not only carry out work, but also reflects on the done work (Hammer, 1996). Organizational structure is a critical success factor for any organization. As discussed earlier, flat structures (process-oriented) bring in multiple benefits. These structures emphasise outcomes rather than functions. They create environments where communication is enhanced all over the structure. Barriers between the different departments and units are eliminated. Under flat structures, employees are empowered to make decisions. Education is key to create a multidisciplinary and efficient staff. Change is part of the game here with staff encouraged to introduce new incremental or breakthrough improvements. Managers should become coaches helping employees to improve and overcome problems. Top management should embrace leadership within an open-minded environment where all are involved and engaged. At the same time, process-orientation requires continuously responding to evolving demands.

The ISO 9001 standard, on the other hand, promotes several features within an organization. It is centred around process-thinking, where the task is identified as a process with stakeholders and plans specified. The standard stresses continuous improvement, with the PDCA cycle being the core concept for the pursuit of continuous improvement all over the organization. Both training and education are essential in the standard. The quality techniques and methods, besides work skills should be instilled in the staff. ISO 9001 requires involvement and empowerment of people. People are involved in planning, execution and evaluation. Decisions are delegated for

less bureaucracy and centralization. Add to that, suppliers and customers are engaged for better planning and outcome. This should be done within an environment where communication is promoted in all directions. Cross-functionality[5] and teamwork are nurtured among the staff. This might entail a culture change to overcome traditional perspectives of competition for promotion. It is assumed here that higher process-orientation provides a better environment for the realization of ISO 9001 benefits, including continuous improvement.

Building organizational resilience in general and resourcefulness in particular requires key elements. First, education and training are of utmost importance. The competencies of the human resource builds in resilience as resourceful organizations require resourceful people. Resource management is another important aspect. Resourceful organizations effectively utilize available resources to achieve the maximum. In difficult times, resource allocation must be prioritized based on outcomes and return. In a resourceful environment, reinforcement is always used to encourage creativity and innovation. Positive feedback constructs a ground for trust and inspires more innovation. Empowerment is also promoted within a resourceful organization. Responding to an unexpected event requires quick reactions. This is achieved through smooth communication and delegation of authority. Both multi-functionality[6] and cross-functionality are important for a resilient organization. It is important that work (planning, execution and evaluation) is carried out cross-functionally. Silos must be avoided under a transparent context. People should be able to carry out multiple roles to replace others when needed. Finally, resourcefulness requires a flat organizational structure. Traditional hierarchies restrict the flow of information and inhibit creativity and innovation.

[5] Cross-functionality refers to deploying people from different functional expertise towards a unified goal.

[6] Multifunctionality (multidisciplinarity) refers to utilising familiarity with different disciplines while staying within the functional boundary.

Resourcefulness is characterized by flexibility, self-organization, functional richness, problem identification, learning, sensemaking, loose-coupling and mindfulness alongside the other features addressed earlier throughout this chapter. These go well with top management commitment, continuous improvement, the PDCA cycle, reliability, efficiency and effectiveness that ISO 9001 brings in. They also align well with flexibility, change, multidisciplinarity, communication and complete-process approach introduced by process-orientation (see Table 2.2). Thus, this study assumes that the implementation of ISO 9001 system enhances resourcefulness in an organizational setting. It also assumes that higher levels of process-orientation further improve this relationship by directly affecting ISO 9001 implementation and indirectly affecting resourcefulness.

2.10 Chapter Summary

This chapter has reviewed the literature of the three main bodies of knowledge relevant to the study: resourcefulness, ISO 9001 and organizational structure. A conceptual framework to guide the research has been developed, which will steer the reminder of the research quest. The review has shown the intersections between the three fields, while highlighting the lack of research on the impact of quality management initiatives on resilience and the role of the organizational structure in this relationship. Further detail on the utilization of the concepts for extraction of knowledge and development of theory is provided in subsequent chapters.

Table 2.2: Intersections between organizational structure, ISO 9001 and resourcefulness.

#	Concept/principal	Organizational structure	ISO 9001	Resourcefulness
1	Communication	√	√	√
2	Engagement	√	√	√
3	Empowerment	√	√	√
4	Teamwork	√	√	√
5	Multidisciplinarity	√	√	√
6	Cross-functionality	√	√	√
7	Fact-based	√	√	√
8	Process-thinking	√	√	√
9	Integration	√	√	√
10	Goal-setting	√	√	√
11	Ensuring capability	√	√	√
12	Resource management	√	√	√
13	Learning & Education	√	√	√
14	Problem identification	√	√	√
15	Improvement	√	√	√
16	Creativity & innovation	√	√	√
17	Change-readiness	√	√	√
18	Deference to expertise	√	√	√
19	Leadership	√	√	√
20	Risk-thinking		√*	√
21	Mindfulness		√	√
22	Sensemaking		√	√
23	Self-organization		√	√
24	Coupling		√	√
25	Entrepreneurship			√

*Introduced in the 2015 version (**Source:** Author).

Chapter 3: Methodology

3.1 Chapter Overview

This chapter introduces and explains the selected methodological framework chosen for the research. It sets the basis for decisions regarding the different facets of methodological aspects, both in terms of the philosophical grounds and research design. The chapter is structured as follows: sections 3.2 through 3.5 introduce the research focus, objectives and questions. Section 3.6 discusses the philosophical foundations of the researcher, hence, the form of research. Sections 3.7 through 3.9 establish the research design, methodology and ethics. Section 3.11 addresses the development of interview questions, including formulation and review. Section 3.12 tackles anticipated problems, while section 3.13 presents the context of the studied organization. Section 3.15 covers pilot testing. Section 3.18 provides an overview of the analysis approach. This is the conceptual framework for analysis (analysis is presented in Chapter 4). Finally, section 3.19 discusses research quality.

3.2 Research aim

According to Blaikie (2009), research aim refers to “the types of knowledge a researcher wishes to produce”. Berg (1995) and Blaikie (2000) suggest two types of research in terms of aim. These are basic and action research. Kruus (1971) explains that basic research (also known as fundamental research) is a concept from the early 20th century that refers to the search for knowledge with no applications in mind. Prior to that, application most often used to precede ‘science’. Basic research is undertaken to create an understanding of a social phenomenon (Blaikie, 2000). It does not take into consideration the ‘practical ends’; it introduces new knowledge that may solve practical problems. Basic research is the raw material practical applications are built on. However, researchers undertaking basic research are aware of the potential direct or indirect consequences of knowledge development. Eventually, the advancement of knowledge aims toward the overall ‘well-being of mankind’. Normally, the researcher has no restrictions or barriers

unleashing her/his imagination and creativity in basic research, reports the National Science Foundation (NSF) (1953). Since this project aims at understanding a theoretical social phenomenon, it is a basic research.

Frankfort-Nachmias and Nachmias (1996) offer three aims for social research, namely, explanation, prediction and understanding. Blaikie (2000) classifies basic research into 8 categories based on objective. The first type is exploratory research; exploratory research provides an accurate and comprehensive picture of the studied phenomenon. It provides an account of a situation with clarity unseen before. The second type is descriptive research; here the research presents a more detailed account than the previous type and usually has a narrower focus. The third type is understanding research; here the research goes beyond causes to reasons. It attempts to understand why a particular action occurs. The fourth type is explanatory research; here the researcher seeks to be educated by those s/he is observing. The fifth type is predictive research; this research attempts to make predictions about the future based on available information. The sixth type is change research; this type of research tries to introduce change to the social setting, either through the research or its consequences. The seventh type is evaluation research; here the focus is to assess the consequences or effects of, inter alia, events, actions or behaviour. The final type is impact assessment research; this research attempts to assess the future consequences of present actions.

Adams and Schvaneveldt (1985) and Sarantakos (1994) explain that among its three main purposes, exploratory research ‘satisfies curiosity’ and provides recommendation on further research in the field of study. Frankfort-Nachmias and Nachmias (1996) explain that taking an exploratory approach means providing an analysis that is both systematic and empirical. Blaikie (2000), Stebbins (2001) and Robson (2016) demonstrate that exploratory research is used when dealing with previously unstudied phenomena. Sarantakos (1994) and Robson (2016) add that exploratory research is more suitable for qualitative data. As this study aims to explore what is believed an uncovered

relationship using a qualitative approach (see next sections), it is deemed exploratory research.

3.3 Research focus

Blaxter et al. (2010) say that “research is a social activity that can be powerfully affected by the researcher’s own motivations and values”. The research focus in this project emanates from two personal motives: the researcher’s academic background in both education and quality management, and the researcher’s professional experience in the field of education. According to Blaxter et al. (2010), research has to be focused to accommodate the needs of the researcher, in addition to relevant regulatory requirements or expectations. This project is a sponsored research by the government of Oman. The growing concerns over the quality of the education system and pressure imposed by changing environments have driven this direction in research. Hence, this research stems from an official need in MoE.

During the Extraordinary meeting of the UNESCO International Institute of Educational Planning (IIEP) Governing Board in Muscat in 2015, the chair of the board, Dr. Birger Fredriksen (2015), stated that “resilience of education systems through crisis-sensitive planning has unfortunately become increasingly important because of the many education systems – and children – affected by conflicts and emergencies”. Being a UNESCO member state, Oman has always sought to realize the goals set by the organization. Thus, this project is considered one further step toward a new need raised by the international organization.

3.4 Research objectives

Within its stated focus, the research seeks to achieve the following objectives:

1. Identify the impact of the implementation of ISO 9001 quality management principles on resourcefulness;
2. Investigate the effect of process-orientation on the relationship between quality management principles and resourcefulness.

3.5 Research questions

In its pursuit of the two abovementioned objectives, this project aims at answering two main questions, which are:

1. To what extent does the implementation of ISO 9001 Quality Management Principles affect Resourcefulness?
2. How does process-orientation affect the relationship between the implementation of ISO 9001 principles and level of resourcefulness?

Beside the two main questions, the study seeks to provide evidence to the following questions:

3. Is there evidence that self-organization generates better ability to respond to challenges within the context of this research?
4. Is there evidence that entrepreneurial spirit develops capability for survival within the context of this research?
5. Is there evidence that mindful organizations are more open to change within the context of this research?

3.6 Paradigm

Guba (1990) defines paradigm as “a basic set of beliefs that guide action”. He clarifies that a paradigm defines researchers’ ‘worldview’. At the same time, paradigms cannot be totally established in terms of truthfulness for they are identified and accepted based on sense (Denzin and Lincoln, 1994). A paradigm includes 3 components: ontology, epistemology and methodology. Tracy (2012) adds axiology, “the values associated with the area of research”, to the previous three elements. This thesis addresses the first three common components.

Hofstede (2001) highlights the ignorance of some researchers of epistemology and ontology-related beliefs. Denzin and Lincoln (1994) suggest that despite different paradigms representing different philosophies, they have crucial implications on the implementation, interpretation and final outcomes

(e.g. decisions) of a research. Huff (2009) indicates that paradigm selection impacts research design, as it, inter alia, can set objectives and facilitate the identification of problems. Fellows and Liu (2015) show that paradigms influence not only embraced views, as they also impact the approach to inquiry and discovery.

3.6.1 Ontology

Everitt and Fisher (1995) indicate that ontology originates from the Greek word ‘ontos’ or the ‘study of being’. Munn (2008) broadly defines ontology as “the study of the traits which all existing things have insofar as they exist”. According to Everitt and Fisher (1995), since ontology is concerned with beings, philosophy has provided four basic categories of existing things. These elements are: physical, minds, abstract items, and space and time. Effingham (2013) claims that in general, ontologists categorize things as tangible and intangible. He shows that philosophers have no overall consensus on the items to be included on the two different lists. According to Effingham (2013), one of the typical aims of ontology is to have a minimal number of things in a person’s ontology. However, he emphasizes that this reduction in ontology should not lead to a loss in properties.

3.6.2 Epistemology

According to Everitt and Fisher (1995), epistemology originates from the Greek word ‘episteme’ which means rationale. Everitt and Fisher (1995) demonstrate that in modern English the term means ‘theory of knowledge’. Slife and Williams (1995) show that philosophically “epistemology concerns the nature, origins, and limits of knowledge”. Frankfort-Nachmias and Nachmias (1996) introduce epistemology as “the study of the foundations of knowledge”. It studies the fundamental grounds (assumptions) knowledge generation is based on. According to them, these assumptions are: nature is orderly, we can know nature, all natural phenomena have natural causes, nothing is self-evident, knowledge is derived from the acquisition of experience, and knowledge is superior to ignorance. Huff (2009) indicates that epistemology relates to what people can identify about existing things.

3.6.3 Methodology

Adams and Schvaneveldt (1985) define research methodology as “the application of scientific procedures toward acquiring answers to a wide variety of research questions”. Scientific procedures here refer to understanding how to conduct research. Sarantakos (1994) explains that “methodology translates the principles of a paradigm in a research language, and shows how the world can be explained, handled, approached or studied”. Frankfort-Nachmias and Nachmias (1996) consider methodology the ground against which the knowledge claimed or introduced by research is evaluated. They describe it as an explicit scheme of rules and measures.

Cohen (1934) claims that to scientists, methodology is more important than the research outcomes. However, this personal belief is debatable among scientists, perhaps more among social scholars. Adams and Schvaneveldt (1985) indicate that methodology systematically approaches data collection and problem-solving. This in turn provides useful data, makes results understandable by others and enables replication of procedures by others. Frankfort-Nachmias and Nachmias (1996) establish that methodology serves three main functions within research. First, it sets rules for communication. Second, it establishes grounds for reasoning. Third, it creates the needed platform for inter-subjectivity (information-sharing with other scientists). Sarantakos (1994) indicates that methodology resulting from the research principles can be quantitative or qualitative.

3.6.4 Selected paradigm

Crotty (1998) demonstrates that a paradigm forms the ‘reality’ to be studied by the researcher and makes both the methodology and methods legitimate. Hofstede (2001) believes that the ontological and epistemological underpinnings of a paradigm stem from one’s personal beliefs and assumptions acquired from culture and during early life. Denzin and Lincoln (1994) show that based on the way a researcher (thinker) answers the questions related to ontology, epistemology and methodology, the selected paradigm represents most enlightened and sophisticated view of its holder.

The ontological question examines the nature of reality and, consequently, what can be known about it. The epistemological question addresses the nature of the relation between the researcher and that to be known. The third question considers how the researcher can find about what they are trying to know.

Following a personal reflection on his philosophical stance, the researcher reached a conclusion that local relativism and social constructionism best represent his beliefs. The researcher believes that no absolute truth exists. He similarly believes in the existence of multiple realities constructed through 'socio-cultural processes'. Interaction and exchange play an instrumental role in both creating the reality and understanding it. The researcher also believes in the subjective nature of social knowledge and the impact of participants on the research. Parallel to the researcher's ontological and epistemological beliefs, the research methodology (detailed throughout this chapter) is consistent with the mentioned philosophy.

3.6.4.1 Relativism

Baghramian (2004) indicates that relativism was observed in classical Greek philosophy. This includes the different conceptions of 'God' people had. Modern criteria of relativism, however, originated in the 18th and 19th century with the development of philosophy. Hinshaw (1948) introduces Protagoras's classic "man is the measure of all things" as a Greek model of relativism. Baghramian (2015) presents two types of relativism, namely, global and local relativism. Global relativists generalize their relative belief to everything. Local relativists, on the other hand, limit their relative belief to specific areas. They acknowledge that relativism does not apply to scientific facts.

Drummond (2005) explains that epistemological relativism refers to the belief among relativists that it is impossible to know if there is an absolute truth. Al-Amoudi and Willmott (2011) explain that "the process of retroductive judgement by which generative mechanisms are identified is understood to be mediated by historically and culturally partial processes of interrogation". Gregersen and Koppe (1988) consider epistemological relativism to be the

core of relativism. Hence, epistemological relativism relates to the inability to reach absolute knowledge, and the role of history and culture in forming perspectives and understanding. As Coulby (1993) describes it, “human knowledge is the achievement of a huge variety of cultures and societies”. In other words, the accumulated human knowledge of any time is compiled by a variety of civilizations over history. According to Al-Amoudi and Willmott (2011), epistemological relativism is widely linked with constructionism.

3.6.4.2 Social constructionism

According to Denzin and Lincoln (1994), constructionists have a belief that what is viewed by other paradigms as objective and true knowledge is no more than perspective. This means the existence of several realities according to constructionism. Gergen (1985) ascertains that for constructionists, understanding occurs as a result of the engagement of people in the phenomenon rather than derived from nature. Gergen (1985) and Burr (2015) believe this is the source of the different variations in conception across cultures and over the different periods of history. Denzin and Lincoln (1994) demonstrate that constructionists stress the importance and practical role of theory building and perception. This more suits qualitative inquiry.

Burr (2015) shows that social constructionism can be traced back to postmodernism which emphasized the co-presence of multiple realities and different styles of life. Gergen (1985) indicates that social constructionism more appropriately reflects the reality of the world created through social interaction and exchange (Denzin and Lincoln, 1994). Gergen (1985) explains that constructionism is based on the belief that “the terms in which the world is understood are social artifacts, products of historically situated interchanges among people”. Burr (2015) says that constructionism is a call to challenge the traditional idea of objective and unbiased knowledge. It ‘invites’ those engaged in social science to have a critical view of a world created through the exchange between people and nature. This ensures not forcing an unsuitable understanding to different contexts. Yet, it makes comparison more challenging.

Gergen (1985) and Burr (2015) verify that understanding is relative to culture and history. Lock and Strong (2010) explain that social changes like the human rights movement result from 'socio-cultural processes'. They stress the fact that people and perhaps animals do have a meaningful life experience. Burr (2015) shows that ignoring this aspect has led to forcing particular knowledge into systems of other cultures. Denzin and Lincoln (1994), Lock and Strong (2010) and Burr (2010) explain that within social constructionism there is no one school. It is a broad area with its central principles holding the followers together under the term constructionism.

3.7 Research design

Bryman and Bell (2003) and Bryman (2004) state that a research design refers to the criteria utilized for the evaluation of business research. They introduce research design as "a framework for the generation of evidence that is suited to both a certain set of criteria and to the research question in which the investigator is interested". It is necessary to differentiate between research design and research method here. As explained by Bryman and Bell (2003) and Bryman (2004), research design guides the implementation of the research method and the following data analysis stage. On the other hand, research method is a data-collection technique or tool. Blaikie (2000) confirms that research design is a control measure for the design process. He believes research design sets a framework that controls researcher's work.

According to Bryman and Bell (2003) and Bryman (2004), the decision over research design has a direct impact on other aspects of the research. These aspects include: the expression of causality between variables, generalization to a larger population, understanding within a specific social context, action and its meaning, and temporally appreciating social phenomena and the interconnections between them. Throughout this chapter the adopted research design is introduced with all design-related aspects for this research project.

3.7.1 Research approach

The research approach refers mainly to the nature of the research method used. The method can be either quantitative, qualitative or a combination of both. The latter is known as the mixed method approach. Quantitative research is numeric-data-oriented, whereas qualitative research is oriented toward non-numeric data.

According to Denzin and Lincoln (1994), qualitative research has reflected throughout its history commitment to subjectivity, a desire to contextualize experiences and a willingness to interpret observations. With an emphasis on processes and meanings, it aims at studying things in their natural environment or setting and capturing the aspects people contribute to the phenomenon (Denzin and Lincoln, 1994). Watkins and Gioia (2015) explain that meaning refers to experiences. As Sarantakos (1994) puts it, qualitative research explores social relations and describes reality in the way people experience it. It deploys a variety of methods (e.g. interview, case study, observation, texts, images…etc.). Several methodologies might be used together for a deeper understanding of the phenomenon in question (Denzin and Lincoln, 1994). Sarantakos (1994) cites Lamnek's (1988) six principles of qualitative research. These principles are: openness in all aspects, research as a communication, the process nature of the undertaken research and studied phenomenon, reflexivity of object and analysis, explication, and flexibility.

Sarantakos (1994) posits that qualitative research demonstrates a number of characteristics. He indicates that qualitative research assumes the social world is constructed by people. It also attempts to capture the real interface. It covers a small sample and does not use random sampling. Add to that, it does not use or present numerical or statistical data. It seeks to approach reality with no present ideas or patterns. It is worth noting that qualitative sampling does utilize random sampling based on research aim and questions. Sarantakos (1994) continues that qualitative research places both the researcher and participant in an equal position. Besides, it studies or attempts

to study the phenomenon within its real setting (from the inside). Finally, it intends to understand participants rather than measure them. Sarantakos (1994) mentions six advantages for qualitative research: studying people in their natural setting, emphasis on meaning and interpretation, in-depth understanding of the setting and phenomenon, elevating the role of the participant, providing flexibility, and introducing a real account of the world. Carr (1994) adds validity as an advantage of the qualitative approach. A further advantage could be the deeper engagement of the researcher.

On the other hand, a number of weaknesses have been associated with qualitative research. Carr (1994) points that researcher involvement may affect the research. This might cause a bias which in turn impacts validity. He adds uncontrolled focus as another weakness. This occurs when the researcher ends up with a huge amount of data that cannot be reduced to a manageable scope. Reliability is another issue for qualitative research due to its unstandardized nature, says Carr. Sarantakos (1994) lists a number of weaknesses of the qualitative approach: risk of collecting useless information, time-consumption, representativeness and generalization due to the small size of the sample, and ethical issues since it involves directly dealing with participants and entering their setting. However, the research design is meant to overcome the disadvantages and capitalise on the advantages of the selected research approach.

Marshal and Rossman (2006) identify six types of research that qualitative research should focus on. These include research that cannot be performed using quantitative methods due to practical and ethical issues, including the ‘why’-question research. This particular situation is applicable here as a quantitative approach will result in a snapshot of the current period. This provides no information about any transformation over time. In addition, a quantitative approach lacks the flexibility for in-depth understanding of investigated topics, beside inability to examine those emerging during data collection. Marshal and Rossman (2006) also mention research that covers informal and unstructured interactions and activities. Similarly, Richards and

Morse (2013) give five reasons to use a qualitative research approach. First, when diminutive information about the phenomenon is known and exploratory research is needed. Second, when studying a transitional situation as such situation necessitates in-depth research that qualitative methods offer. Third, when there is a need to study participants' experience. Fourth, when the study focuses on developing a new theoretical position. Qualitative research is more suitable for theory development. Fifth, when there is a need to understand the interactions between the proposed variables (the 'why'-question research). In this case the interaction between quality management and organizational resilience.

Based on the philosophical assumptions of the researcher, the research will use a qualitative approach. Moreover, the abovementioned reasons do apply to this study, thus, making the chosen approach the most suitable indeed.

3.7.2 Qualitative methods in management research

In a 1979 article, Van Maanen et al. mention the monopoly of quantitative methods in social research. They refer to the 'slow emergence' of qualitative research in the field at the time, including disciplines like economy. Van Maanen and his team aimed at encouraging the use of qualitative research in the field of organizational research. Reason and Rowan (1981) argue that qualitative research contributes to the body of knowledge in management research. According to Argyris (1985), following a qualitative approach offers research in management and business administration effective tools. Prasad and Prasad (2002) suggest that qualitative research 'exploded' within management research due to the limitations of the conventional quantitative approach. Cassell et al. (2006) show that papers with qualitative methods are regularly published in top US and European journals.

Bartunek et al. (2006) published an article on 'What Makes Management Research Interesting?'. Among the features they recommended was qualitative research. This is mainly because qualitative research contributes to developing theory. Bluhm et al. (2011) show that the number of qualitative papers in top US journals has grown significantly. The number of qualitative

works published within the last 10 years, prior to the publication of their paper, was more than the number in the previous 20 years. In their study on 198 papers from top European and American Journals, they indicate that more researchers are shifting to the qualitative approach. This is because qualitative research contributes to theory generation.

The abovementioned brief aims at shedding light on the presence of qualitative research in management research. The growth in scholars using qualitative methods reflects the effectiveness and success of the approach, especially, in theory building.

3.7.3 Research strategy

Blaikie (2000) indicates that research strategy is a framework of procedures set to answer the research questions. There are a number of ways people approach this aspect of research. According to Copi (1978), traditionally, arguments are referred to as deductive and inductive. Whewell (1967) explains that “in deduction we infer particular from general truths; while in induction we infer general from particular”. These strategies imply different processes toward answering the questions (Blaikie, 2000).

Ghauri et al. (1995) refer to induction as “the process of observing facts to generate a theory and is perhaps the first step in scientific methods”. Thus, in the inductive strategy, theory follows observation. Blaikie (2000) affirms that the strategy uses ‘inductive logic’ to infer assumptions from data. Ghauri et al. (1995) explain that conclusions are drawn from experiments (observations). The conclusions, however, must be consistent with the provided inputs or facts. Tracy (2012) describes a four-step process of inductive research. The first step is observing interactions; the second step is theorising patterns; the third step is making and examining claims; the fourth step is drawing conclusions (theory-building). According to Blaikie (2000), this strategy has a better potential to answer ‘what’ and ‘why’ questions. Open-ended questions are utilized to gather relevant responses (Frankfort-Nachmias and Nachmias, 1996). This strategy is more associated with qualitative research than quantitative research (Sarantakos, 1994; Tracy, 2012).

Based on the research philosophical underpinnings, objectives and questions, and approach, this research will follow an inductive strategy. This strategy is more suitable and useful as it involves eliciting inputs from participants for theory-building. Participants are perceived partners in the project as explained in the section on paradigm. Add to that, interaction with participants is considered an important research asset within the selected paradigm. Moreover, research objectives are geared toward theorizing the relationship between quality management and organizational resilience (in particular ISO 9001 implementation and resourcefulness). In addition, 'what' and 'why' questions are utilized for the purpose. Thus, the inductive strategy is perceived most useful. Finally, in the previous section, the research opted for the qualitative approach, which is commonly associated with the inductive approach.

3.8 Data collection

One of the most important elements of research is data collection. It is broadly defined as "the process of gathering and measuring information on variables of interest, in an established systematic fashion that enables one to answer stated research questions, test hypotheses, and evaluate outcomes" (Responsible Conduct in Data Management, n.d.). Hypotheses testing is associated with quantitative data. In qualitative research, data collection is generally concerned with answering the research questions and evaluating outcomes. However, Silverman (2014) explains that in qualitative research hypothesis testing is used to refer to the process of checking ideas emerging from data. Researchers use a variety of research methods to collect data. These include, inter alia, surveys, observation, interviews and tests. Sarantakos (1994) describes the research method as the connection between the researcher and respondents.

This research is developed on the basis of in-depth interviews as a source of primary data. The literature is also used as a source of secondary data.

3.8.1 Interviews

Berg (1995) refers to interview as a conversation for the purpose of information-collection. Denzin and Lincoln (1994) point that interviewing has a long history dating back to the ancient days of the Egyptians. However, Charles Booth is known for using interviews for data collection in a social survey for the first time in 1886. His study was published later under the title “Life and Labour of the People in London (1902-1903)”. According to Denzin and Lincoln (1994) and Sarantakos (1994), interviews are among the most commonly used methods in social research. They come with a range of forms and purposes, including, face-to-face exchange with an individual, face-to-face exchange with a group of people, mailed questionnaire and telephone surveys. An interview can be conducted over a single or multiple session(s) (Denzin and Lincoln, 1994). Interviews are usually categorized as structured, semi-structured and unstructured interviews, also called standardized, semi-standardized and unstandardized interviews by some sources.

In the structured interview, the researcher asks a pre-established set of questions. These questions are thought to be comprehensive to cover the issue under study. There is little room for flexibility since all interviews are aimed to produce standardized data that normally fall into pre-identified schemes. Thus, all participants receive the same questions in the same order (Denzin and Lincoln, 1994; Berg, 1995). In unstructured interviews, the researcher assumes that not all related questions can be anticipated. Therefore, a list of questions is prepared, but others are generated and adapted according to the flow of the conversation to achieve the aim of the research. This type of interviews allows space for the collection of extra data (Denzin and Lincoln, 1994; Berg, 1995). Add to that, Berg (1995) indicates that unstructured data can be used to establish familiarity with participants, especially if the researcher is unfamiliar with them.

Semi-structured interviews come somewhere between structured and unstructured interviews. Here, the researcher prepares a list of predetermined questions and may ask further questions that are dependant on the answer

given. The general belief here is that people have different understanding of the world. Hence, the researcher seeks to approach the participant from his own perspective (Berg, 1995). According to Bryman and Bell (2003) and Bryman (2004), unstructured and semi-structured interviews are the most common in qualitative research. Bryman and Bell (2003) and Bryman (2004) establish that semi-structured interviews are better for investigation with a 'fairly clear focus'. This helps to identify and address more specified topics.

Sarantakos (1994) gives a number of advantages for interviews. He believes that interviews provide flexibility, high response rate and easy management. In addition, he suggests that interviews guarantee observation of non-verbal behaviour. Sarantakos (1994) assumes that interviews require lesser level of motivation and patience (in comparison to questionnaires). Furthermore, interviews offer control over setting, space to correct any misunderstanding, control over question sequence and ability to record spontaneous responses. Moreover, interviews allow the identification of the respondent. On top of that, with interviews completion is normally ensured. Other advantages include control over time and venue, capacity to use complex questions and more details are gathered. However, the amount of details should be balanced, so the flow of research is not hindered by both unnecessary data and perhaps analysis paralysis later. Ghauri et al. (1995) suggest that interviews elicit a clearer and more precise response from participants.

On the other hand, Sarantakos (1994) presents factors that undermine the method. These are: cost and time consumption, presence of interviewer might cause bias, inconvenience, lack of anonymity, and less effectiveness when discussing sensitive issues. Ghauri et al. (1995) define three disadvantages for interviews: they require a skilled and thoughtful interviewer, they are time-consuming, and they are hard in terms of interpretation and analysis. However, good planning and preparation should help overcome such issues.

Ghauri et al. (1995) indicate that interviews are well-suited for studies with an exploratory and inductive nature, added to that, interviews align well with constructionism and qualitative research, in particular semi-structured

interviews. This is true as understanding the studied phenomenon requires understanding the individual experience of participants. Accordingly, this research employs semi-structured interviews for data collection in order to achieve the research objectives.

3.8.2 Sampling

Sampling decisions are some of the most important in research. Sarantakos (1994), Frankfort-Nachmias and Nachmias (1996), Zikmund (1996) and Saunders et al. (1997) confirm that sampling enables the study of a relatively small number of units as a representation of the whole population. Sarantakos (1994) defines sampling as “the process of choosing the research units of the target population, which are to be included in the study”. Frankfort-Nachmias and Nachmias (1996) state that it is essential for a sample to be as representative as possible. A representative sample is one that reflects the population when analysed. In qualitative research, the aim might be to represent the sample itself, not the population. Ghauri et al. (1995) agree that sampling is very useful and versatile in business studies. Saunders et al. (1997) show that sampling is used instead of studying the whole population for four main reasons, practicality, resource constraints, time consumption and time pressure.

According to Sarantakos (1994), sampling in qualitative research reflects the philosophy of the approach. For instance, it utilizes less quantification, structure and restriction when compared to quantitative sampling. Mostly, qualitative research opts for non-probability procedures such as purposive, theoretical, accidental and snowball sampling. Sarantakos (1994) and Saunders et al. (1997) clarify that purposive sampling (also known as judgemental sampling) gives the researcher the freedom to use her/his judgement. The aim is to select a sample that best fits the purpose of the study and answers the questions. Saunders et al. (1997) add that this procedure is suitable when studying a homogenous sample in-depth.

This study utilizes a purposive procedure to ensure suitable participants are interviewed. As the study investigates the impact of the implementation of ISO

9001 on resourcefulness, interviewees must be familiar with the situation before and after the implementation of the standard. They should be also familiar with difficulties faced by the organization over recent years. Moreover, the research seeks to identify a diverse sample in terms of job ranks to reflect a more realistic view.

Sarantakos (1994) reports that several researchers believe that size relates to the nature of the population. In other words, the decision deals with the quality aspect rather than quantity aspect. He provides considerations to be accounted when drawing a sample. These include: A) homogeneity; when the population is homogenous, a small sample can be sufficient, and B) research approach: quantitative research requires larger samples than qualitative research (qualitative research is more intense and time consuming). Since this study follows a qualitative approach aiming at an in-depth study of a specific population (the population comes from the same macro context), considering intensity and time restrictions, a sample of 20 participants was perceived to meet the objectives of the study. However, the researcher was conscious that the matter depended on reaching saturation (coverage). Hence, the process ended with a total of 32 interviews.

3.8.3 Unit of analysis

According to Trochim and Donnelly (2008), the unit of analysis is the main entity a researcher analyses in the study. They demonstrate that examples of units of analysis include individuals, group/s of people, objects (e.g. documents and visual items) and social phenomena (e.g. divorce and crime).

Frankfort-Nachmias and Nachmias (1996) highlight two misconceptions researchers must be aware of when deciding on the unit of analysis, the ‘ecological and individualistic fallacies’. The researcher needs to be careful when making inferences about individuals based on data collected about groups (e.g. communities or nations) to avoid the ecological fallacy. The researcher must be equally careful when drawing inferences about individuals based on data collected about individuals to avoid the individualistic fallacy.

In this study, the unit of analysis is an organization, MoE, whereas the unit of collection will be individual employees within the Ministry.

3.8.4 Access

Data collection depends totally on obtaining access to its source. Gummesson (1991) describes access as the number one challenge for a researcher. Saunders et al. (1997) show that access can be problematic for three main reasons. First, due to time and resource constraints, organizations might not be ready for such a step. Second, requests for access might fail to interest those in the organization. This is affected by the perceived value of the topic, potential sensitivity of the issue and doubts about the researcher him/herself. Third, other external events may force the organization to refuse such requests, even if it is ready for such query.

This study is sponsored by the Oman Ministry of Higher Education and the Ministry provided all the necessary help and support to ensure access to data. Added to that, the study is sponsored based on a request from the Ministry of Education, the organization to be studied. Hence, the Ministry of Education was committed to providing access for data collection. Finally, the researcher is an employee in the Ministry of Education, which further facilitated access.

3.9 Research ethics

Frankfort-Nachmias and Nachmias (1996) indicate that social research ethics ensure the “rights and welfare of persons and communities that are the subjects of scientific studies”. Ethical issues may arise because of a number of research-related dimensions, including, the research problem, the environment where the research is conducted, research procedures, data collection method, the type of participants and nature of collected data. Sarantakos (1994) illustrates that, in general, codes of ethics deal with professional standard and ethical conduct; the researcher-participant relation; the researcher-researcher relation; and the treatment of animals in research.

As Frankfort-Nachmias and Nachmias (1996) mention, professional communities have set ethical codes for their members to follow. These codes

describe the required and prohibited. This study follows the ethical codes of the University of Edinburgh. These ethics are: respect for free and informed consent; respect for privacy, anonymity and confidentiality; respect for vulnerable persons; and respect for physical and psychological safety of researchers. In relation to the studied organization, written approval had been obtained prior to arranging for and conducting the interviews.

3.10 Insider-outsider approach

As a means to produce a more robust research, the research employs an insider-outsider approach. This provides experienced reflection on findings by a senior member from the studied organization. Evered and Louis (1981) considers the insider more suitable for cases related to, among others, coping and survival. Gioia et al. (2010) explains that the approach provides an experienced insider voice for the best articulations of reasons behind observed notions and actions. However, the insider expert takes no role in data analysis to avoid any bias (Gioia et al., 2010). By combining an insider and outsider inquiry, a more holistic and trustworthy approach is reached (see Figure 3.1).

Figure 3.1: Insider vs Outsider research inquiry.

Dimension of Difference	MODE OF INQUIRY	
	From the Outside	From the Inside
Researcher's relationship to setting	Detachment, neutrality	"Being there," immersion
Validation basis	Measurement and logic	Experiential
Researcher's role	Onlooker	Actor
Source of categories	A priori	Interactively emergent
Aim of inquiry	Universality and generalizability	Situational relevance
Type of knowledge acquired	Universal, nomothetic: theoria	Particular, idiographic: praxis
Nature of data and meaning	Factual, context free	Interpreted, contextually embedded

Source: Evered and Louis (1981).

3.11 Interview questions

Ghauri et al. (1995) emphasize that interview questions should be linked to the research problem. The draft questions should be compared to the problem

by the researcher and others several times. This enables checking both consistency and accuracy of these questions. Berg (1995) points that question-wording should stimulate as complete answers as possible from participants. Ghauri et al. (1995) suggest holding a pilot study to check interviewees' understanding of the drafted questions. A pilot study also provides more information about the 'cultural endowment' of participants.

When formulating questions, Berg (1995) warns of a few issues that need to be considered. First, questions should normalize any potential sensitivity. It should indicate that a behaviour or event relates to the general population not the participant alone. Second, 'double-barrelled' questions should be avoided. These are questions that seek to collect responses on more than one issue at the same time. Third, questions need to avoid complexity; the researcher should maintain simplicity and brevity. Fourth, sequencing is crucial for the flow and success of the interview. Easy questions should come first followed by gradually more complex ones. An additional important rule is avoidance of unfamiliar terms.

3.11.1 Formulation

To ensure linking interview questions to research objectives and questions, each research objective and its relevant research question(s) were grouped in a table. For each group, questions were developed in the same table in accordance with the research objective and question (see tables in Appendix A). The first draft consisted of six tables each dedicated to a research question. However, due to interconnectedness between research objectives and questions, four tables were merged to introduce better coherence and flow. As a result, three sets of questions were introduced, with one for introductory questions, while each set of the other two covering one of the two main research questions, organizational structure and resourcefulness.

The question set regarding organizational structure was developed based on the literature review in Chapter 2. Nine main concepts were selected to assess the organizational structure, namely, communication, employee engagement, employee empowerment, routine/process-orientation, multidisciplinarity,

cross-functionality, expertise-utilization, change readiness and leadership's perception of existing structure. These concepts were the most emphasised in the literature, besides being general enough to encompass other concepts and specific enough to be assessed. Similarly, questions about resourcefulness were developed following a consultation of the literature in Chapter 2. Ten questions were developed, each representing one main component or attribute of resourcefulness, with one assessing the overall resourcefulness of the system. The questions covered, problem identification and prioritization, resource mobilization, organizational learning, sensemaking, self-organization, entrepreneurial spirit, mindfulness, coupling and overall resourcefulness.

3.11.2 Feedback

According to Flick (2007), feedback and peer checks represent good practice in qualitative research. These measures enhance the quality of the work. Hence, following the preparation of the first draft of interview questions, these were passed to experts (academics from the relevant field(s) of study) for review. Two academics reviewed the first draft questions. This resulted in two main changes. First, the used language sounded more academic than everyday communication. This might have made it difficult for participants to understand the questions. Therefore, questions were rewritten using everyday language. Second, due to the complexity of studied concepts, questions looked complex too. Again, this could have hindered the flow of interviews and resulted in inappropriate responses, if any. Thus, complex questions were divided into multiple simple questions. After implementing the recommendations of the experts, the second draft was sent again for review to the reviewers (this time there were three academic reviewers). Though, the language looked eligible and simple, the scope of the questions posed restrictions to answers (being very narrow questions) and the interview was anticipated to be very long, according to reviewers. Therefore, questions were regrouped and reformulated into more open-ended questions. Finally, the third draft was approved.

Similarly, PhD colleagues of the researcher were involved in the review process. Two PhD researchers from the relevant fields of study kindly reviewed the different drafts. The main comments were similar to those raised by the academics concerning language and length of the interview. Realising that the studied context has its own particularity, experts from the studied organization were invited to review the questions. One PhD holder and 1 experienced senior supervisor (both long serving and middle management employees) were involved in the review to ensure eliciting feedback from multiple sources and levels. This aimed mainly at ensuring that the used concepts are clear and reasonable. The remarks of these reviewers concerned mainly the length of the interview and some complexity of terminology.

Based on reviewers' feedback, the final draft was deemed appropriate and ready for a pilot study. Hence, the questions, information sheet and interview consent form were translated and sent for review by two professional translators.

3.12 Anticipated problems

Before conducting data collection (interviews), some challenges were perceived. First, the research data collection method (interviews) was scarcely used in the country. Researchers tend to avoid it as individuals do not cooperate giving the time it requires. Similarly, organizations think interviews might hinder workflow. Hence, though, the researcher had access for data collection, both oral and written confirmations had to be made to the organization that personal interviews will be conducted over several weeks. This ensured both the flow of the data collection phase and workflow within the studied units. Similarly, participants had been interviewed based on personal consent, ensuring them their anonymity, right to withdraw and choice of conducting the interview over two sessions. The two-session approach could ease fears of delays, probably encouraging more people to participate. Second, interviews needed to avoid peak periods during which workload becomes very high in the organization. Otherwise, participating individuals

would have focused on answering the interview as fast as possible, rather than providing proper and complete responses.

Third, it was expected to have some uninformed participants or incomplete responses. Therefore, additional interviews were requested to compensate for any potential problems. Forth, due to the breadth of the topic investigated, the interview seemed to be very long. The main effort was reducing the number of questions based on the literature and inputs from reviewers, eradicating nonessential questions. Added to that, conducting the interviews over two sessions was suggested, yet the challenges would have been then loss of link between the main topics, besides doubts about meeting the participants again. However, the pilot study clarified that it was not an essential measure, which proved right at the end as only one interview was held over more than one session. Inputs regarding interview length and flow were gathered after each interview during the pilot study.

Fifth, bearing in mind cultural factors, recording of interviews was perceived as unacceptable by some, especially female participants. In fact, females could have not accepted having an interview in case of recording. The researcher made it clear from the very beginning that interviews would not be recorded without permission from participants. Added to that, interviews were conducted in participants' setting to make them feel more comfortable and calmer. Finally, due to the same cultural factors, it was expected that males were more open to interviews than females. This might have caused a bias both in data collection and outcomes later. The researcher encouraged both the organization and females to take part. In addition, the researcher considered issues raised by female participants (e.g. no recording) to overcome this issue.

3.13 Geographical location, context and time

Data collection was conducted in the capital city of the Sultanate of Oman, Muscat, where the headquarter of MoE is located. For more harmony and consistency, the researcher studied two Directorate-Generals (DGs) within

the Ministry. These were the first two units within the organization to implement the ISO 9001 standard.

Data collection took place between November 2017 and May 2018. This included the time required to initiate correspondence, acquire official permission, do the pilot study, identify a sample and conduct the interviews. To ensure that data collection did not affect the workflow within the units, two interviews were proposed every week, though more were conducted sometimes. Below is a detailed timeframe for the research project (Table 3.1).

Table 3.1: Research timeframe.

Year	Action
1	**Preparation** ✓ Literature review. ✓ Research methodology. ✓ Interview questions (draft preparation).
2	**Data collection** ✓ Interview questions (review). ✓ Pilot study. ✓ Research tool evaluation and reorganization. ✓ Conducting interviews. ✓ Data transcription. ✓ Initiating analysis (coding using Quirkos).
3	**Analysis and findings** ✓ Analysing data. ✓ Presenting findings. ✓ Writing up.

Source: author.

3.14 Interview preparation

To prepare for interviews, the researcher was engaged in extensive reading. These readings focused on the main aspects to consider before, during and after the interview. Denscombe (1998) and Creswell (2007) point to taking participants' consent as an essential requirement, indicating to them the time required to complete the interview. Creswell (2007) indicates that the

interviewee has the right to know how this data will be used. According to Saunders et al. (1997), the interviewer should have good knowledge of the context to be studied. This can be achieved by reading previous research on the same organization or exploring documents published by the organization itself (use of secondary data). Good preparation enables the interviewer to assess collected information and avoid bias. Saunders et al. (1997) also point to the importance of supplying the covered themes to interviewees in advance. This enables them to prepare well, therefore, providing a better account of the studied concepts. At least, having the themes in advance, will give them the opportunity to understand any new concepts.

According to Denscombe (1998) and Creswell (2007), the interview needs to be conducted in a place with no disruption and where privacy is guaranteed. Saunders et al. (1997) and Denscombe (1998) emphasise that the interviewer's appearance is an important factor. It might impact the interviewees' impression toward the researcher and perhaps the research. The dress should be acceptable within the studied community/organization. Added to that, Saunders et al. (1997) clarify that opening comments need to be trust-builders and relaxing. Denscombe (1998) indicates that these comments must avoid upsetting the interviewee. He also suggests starting with easy questions. Denscombe (1998) points also to two important aspects to be considered during the interview. First, proper eye contact should be maintained with interviewees. Second, at the end of the interview, participants should be invited to provide feedback on the issues under study. A good idea would be asking for their opinion about the flow of the interview itself. Finally, Denscombe (1998) reminds of the importance of courteously thanking the interviewee at the end.

In line with the abovementioned points and the research ethics, participants were provided with an information sheet about the research (see Appendix B), showing the approximate time required and how their inputs would be used. The summary indicated the themes to be discussed during the interview. On the top of that, both the interview and recording were applied based on their

written consent only (see Appendix D for Interview Consent Form), giving them the choice to stop the recording or withdraw at any time. Most importantly, participants were anonymized, and recordings kept in accordance to the University's regulations. All other issues were considered to ensure the successful implementation of the interviews.

3.15 Pilot testing

Even though some scholars (e.g. Black, 1999) believe that pilot testing may not be effective as different interviewees may approach different questions with different perceptions, Foddy (1993) assures that pilot testing can identify the aspects that can give the interviewer difficulties. Similarly, Morse et al. (2002), explain that pilot tests target refining data collection strategies. Creswell (2007) refers to pilot tests as a means to refine both interview questions and measures. Hence, pilot interviews were perceived necessary to further refine the interview questions and give better sense on how the interview should be approached. Added to that, they helped to identify the real time required for each interview. For this purpose, four interviews were perceived adequate, which resulted of better framing of research questions.

The pilot study revealed and resulted in the following: first, the use of the concept of organizational structure led to confusion between hierarchy and structure, thus it was replaced by 'working environment'. Second, an additional question on efficiency was added to have better understanding of resource mobilization techniques. Third, the pilot showed that females were very reluctant to join in, so it was reiterated that recording was optional. Fourth, based on the pilot, it was decided that a short explanation and sometimes an example (examples were avoided as much as possible since they might have impacted the answer) had to be given for some concepts (e.g. mindfulness). After making the needed adjustments, data collection was conducted across the purposeful sample.

3.16 Recording and note-taking

According to Saunders et al. (1997), recording an interview provides multiple advantages, including, giving attention to listening rather than taking notes, re-listening and accuracy. Denscombe (1998) points to the limitations of human memory for which recording can compensate. On the other hand, Saunders et al. (1997) show that recording interviews can introduce disadvantages such as impeding some responses, possibility of technical problems and long time for transcription. Saunders et al. (1997) reminds of the importance to take interviewees' consent for recording. Similarly, the interviewee should have the right to terminate recording at any time.

According to Denscombe (1998), notes can replace or complete audio recording. Notes can log impressions, whether verbal or contextual, that audio recording normally misses. At the same time, notes can ensure having data in case recording fails or technical issues arise. Denscombe shows that notes are crucial to monitor the progress of the interview. They can be used to, inter alia, highlight key points, underlying logic and inconsistencies.

For transparency and to ensure a more accurate account, interviews were recorded after asking participants' consent. At least two separate recording devices were used in case of any technical failure. This was accompanied by note-taking, while ensuring good eye contact with interviewees. However, in cases where participants declined being recorded, detailed notes were taken.

3.17 Transcription

Transcription is a very important aspect of qualitative data analysis (Denscombe, 1998; Oliver, 2005), yet very time-consuming. According to Denscombe (1998), every hour of recording requires several hours of transcription. Still, the efforts are worthwhile. Denscombe (1998) describes transcription as a valuable component as it puts the researcher closer to the data. Eriksson and Kovalainen (2008) think transcribing interviews make the researcher more familiar with her/his data. Widodo (2014) suggests that transcription provides an opportunity for deep intellectual work. Additionally,

Denscombe (1998) explains that transcribed data is much easier to deal with during analysis. He also points to the need to use ‘annotations’ or informal notes. These refer to notes taken during or immediately after the interview to add richer meaning. Eriksson and Kovalainen (2008) and Silverman (2010) indicate that transcription methods vary in accordance with the studied research problem. No single transcription method exists or applies to all.

Looking at the importance of transcription, the researcher attempted to transcribe each interview directly following its completion. This aimed at minimizing any loss of meaning, including non-verbal expressions and other gestures. The recordings were transcribed in the original language (Arabic). This was due to three main reasons: 1) to enable review and feedback by participants, as they had the right to do that; 2) financial and administrative constraints as translating all transcriptions required much time and financial resources; and 3) to conduct analysis of Arabic transcriptions using Quirkos, which minimised loss of valuable data. To ensure quality, professional translators were asked to review the translation of the quoted parts.

3.18 Analysis

According to Sarantakos (1994), the principles of qualitative data analysis originate from interpretive science. Therefore, qualitative data analysis involves a bit of quantitative methods. Sarantakos explains that data collection is considered an essential component of data analysis in qualitative research. For qualitative data, Sarantakos suggests a three-stage analysis process. These three stages are: data reduction, data organization and data interpretation. These are the three commonly used stages in qualitative data analysis.

According to Sarantakos (1994), data reduction is the “process of manipulating, integrating, transforming and highlighting the data while they are presented”. This refers to summarizing or categorizing data (e.g. transcriptions). The aim in this stage is to have a more focused data to enable inference later. However, the first step would be reading the transcriptions

carefully, so the researcher becomes familiar with the content. Then, key topics and directions are identified throughout the content. This prepares the data for categorization based on specific attributes determined by the researcher. Nevertheless, this step can vary across different research contexts.

Data organization, on the other hand, is the process of specifically grouping data. Here data are further categorized in a way that enables, to some extent, the observation of main trends. Sarantakos (1994), shows that this phase may involve the use of statistical data (e.g. word frequency) and graphs to introduce preliminary results. The phase is concerned with transforming raw data into beneficial information. It is also concerned with preparing this information for the final stage.

The last stage is interpretation. Sarantakos (1994) explains that this stage aims at making decisions and drawing conclusions. The decisions and conclusions target answering the research questions. In this phase, patterns are identified, and trends revealed and clarified. However, the researcher can still repeat data reduction and categorization whenever deemed necessary. Similarly, more data can be collected if needed. The process with its three phases can be repeated until ‘saturation’ is realized. According to Sarantakos (1994), saturation refers to achieving satisfaction with regard to the analysis process.

According to Liamputtong (2005), in qualitative research, it is believed that words have more power than numbers. This is why thematic analysis is common among qualitative researchers. As the overall philosophical underpinnings of the research focus on meaning, the analysis approach used here was based on thematic analysis. Thematic analysis seeks to identify patterns of meaning within texts (e.g. transcripts).

3.18.1 Coding

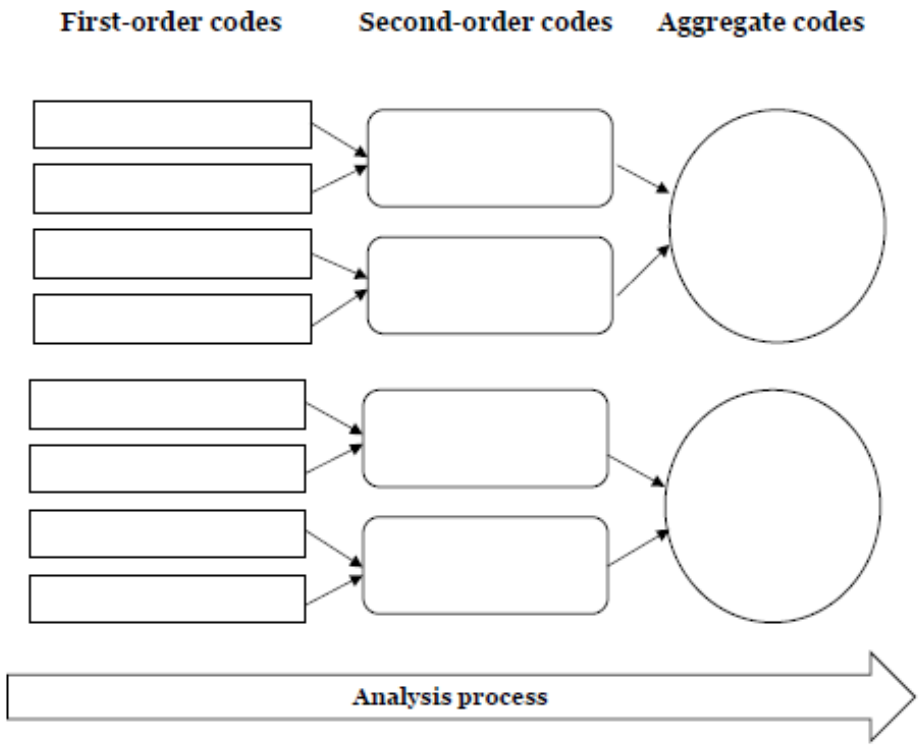
According to Richards and Morse (2007), coding aims at simplifying and focusing chaotic data into meaningful ideas. Charmaz (2014) introduces

coding as attaching “labels to segments of data that depict what each segment is about”. Richards and Morse (2007) point that coding is not a mere mechanical process of labelling. In fact, it entails theorizing and linking data. A key feature of the Sarantakos (1994) approach is coding, a pillar of qualitative data analysis in general. Coding involves both data reduction, data categorization and data representation. This shows the importance of coding as an integral aspect of qualitative data analysis. It is the means by which data is analysed.

According to Blaikie (2009), coding “involves the use of concepts (labels placed on discrete happenings, events, and other instances of the phenomena) and categories (a more abstract notion under which concepts are grouped together)”. Bryman and Bell (2003) and Bryman (2004) emphasise that normally any qualitative data analysis begins with coding. Sarantakos (1994) indicates that several researchers utilize coding as an analysis tool. Blaikie (2000) explains that coding involves two phases, namely, open and axial coding. Open coding refers to categorizing and subcategorizing data, while axial coding is about connecting the different subcategories to the categories. Hence, open coding breaks down data into categories and subcategories, while axial data combines data again using reasoning (e.g. causation and effects). In addition to open and axial coding, Sarantakos (1994) adds selective coding. This is a more specific phase that looks for additional evidence, mainly used to check particular topics.

This research utilized Sarantakos’ (1994) three-stage analysis since it provides a straightforward and efficient approach. For coding, open, axial and selective coding (also referred to as 1st-order, 2nd-order and aggregate coding) were used for analysis (see Figure 3.2 for an overview).

Figure 3.2: Overview of the coding process.



Source: Author.

3.18.2 Use of software for data analysis

According to Cope (2014), Computer-Assisted Qualitative Data Analysis Software (CAQDAS) was introduced during the 1960s. However, the use of this kind of software boomed in the 1980s and 1990s. Kikooma (2010) states that the software bundles were developed based on researchers' specific requirements. Lewins and Silver (2007) explain that CAQDAS approaches data analysis in a way compatible with qualitative methods. The software is used by researchers in analysis to facilitate data coding, which makes data analysis more efficient and straightforward. St John and Johnson (2000), Froggatt (2001), Gibbs et al. (2002), Carcary (2011) and Cope (2014) agree that CAQDAS provides several advantages to the researcher. It releases the scholar from heavy labour-intensive or mechanical work. Thus, more time is allowed for researchers to focus on intellectual work.

Crofts and Bisman (2010) describe CAQDAS as an empowering tool for researchers. Cope (2014) posits that the software enhances both efficiency and flexibility in the analysis process. In addition, it provides data sharing and management features over multiple outspread computers all over the world. Lewins and Silver (2007) maintain that using CAQDAS offers improved access to and investigation of data. They claim that effective use results in greater continuity and transparency, and methodological accuracy. Froggatt (2001) and Gibbs et al. (2002) point that CAQDAS software is capable of processing various data formats like text, audio and images. Furthermore, Froggatt (2001) indicates that 'within document search' or 'query' is another advantage of using CAQDAS. This feature enables the location of specific concepts within large data sets. Though, this is not a real advantage since traditional word processing software can do this. St John and Johnson (2000) list some advantages for CAQDAS, namely, efficacy and speed, flexibility and thoroughness, validity and rigour, and novel approaches to analysis. Carcary (2011) suggests that the use of CAQDAS leads to higher transparency and validity in the analysis process.

On the other hand, scholars have cited some disadvantages for the use of CAQDAS in qualitative data analysis. Froggatt (2001) mentions the high cost of training, besides the time needed to acquire related skills as key disadvantages. Cope (2014) argues that using CAQDAS disengages the researcher from data. He believes that the closeness offered by traditional methods may be lost here. St John and Johnson (2000) present some drawbacks for CAQDAS. They indicate that CAQDAS focuses on quantity and standardization of analysis in social science. Also, they believe the software puts emphasis on coding and retrieval. Moreover, they claim it disengages the researcher from data. Besides, it diverts from the real aim of qualitative data analysis. They also point that the software puts more pressure on expectations. Finally, the scholars indicate commercialism as another disadvantage for CAQDAS.

A number of scholars, including Froggatt (2001), Carvajal (2002), Cope (2014), Crofts and Bisman (2010) and Carcary (2011) emphasize that the software is a tool for researchers to use. It does not perform analysis as reasoning and scrutiny is conducted by the researcher or research team to synthesise findings. This research project utilized Quirkos, a CAQDAS provided by the University of Edinburgh. The University also provided courses and training workshops on CAQDAS, which the researcher was enrolled in for a full semester. The decision over using a CAQDAS stems from four main reasons. First, to facilitate an efficient analysis process. Second, to allow more time for critical thinking and reasoning. Third, to keep pace with the advancement in research analysis. Fourth, to provide a platform for safe and secure data management and sharing (when sharing is needed).

3.18.3 Memo-writing

For any qualitative data analysis process, memo-writing is an integral part. Memos serve as records of the ongoing intellectual and research works. With these notes in hand, reflections in relation to the data collection process, interview sessions, and coding are possible. In addition to that, memo-writing facilitates formulating new questions and making more reflections on both earlier or current work. This research used both handwritten and electronic notes for note-keeping, linking themes and finding relations.

3.18.4 Data management

Good data management is a crucial part in any knowledge endeavour. Issues like, inter alia, data search, storage and retrieval need to be considered very early. This should facilitate access to the pool of data accumulated over several years. Saunders et al. (1997) emphasise having a proper data management procedure in place. For this research, Microsoft Word and Quirkos were utilized for data management (see the section on CAQDAS for more about the use of Quirkos). Microsoft Word is the word processing software used for writing, editing, keeping and representing relevant data. Similarly, EndnoteWeb was used from the very beginning to ensure maintaining electronic and ready to retrieve records of resources. Digital

documents (those that are permitted to be saved), on the other hand, were stored on a personal computer, while kept indexed for fast recall when needed. All relevant files have had backups on the university server, external hard disc and three cloud services as a precautionary measure. This very conservative approach resulted from an incident where some data was lost during the early stage of the project.

3.19 Data quality

Ghauri et al. (1995) insist that qualitative researchers should demonstrate validity of findings. However, qualitative data evaluation remains a controversial issue, with no one fit-for-all standardized procedure. Yet this is the essence of qualitative research as it seeks to embrace meaning or individual experiences. Saunders et al. (1997) refer to the complexity of issues qualitative research covers. These issues necessitate flexible approaches to account for the involved dynamic circumstances. Denzin and Lincoln (1998) show that verification in qualitative research occurs 'throughout' the project. It is not only a follow-up procedure when work is completed.

Different scholars have used different criteria toward verifying qualitative data. Sometimes the terminologies may differ, but the same underlying meaning remains there. This is because the researcher herself/himself is the instrument in this type of research. Mason (2002) suggests validity, generalisability and reliability as quality criteria for qualitative research. On the other hand, Lincoln and Guba (1985), Guba and Lincoln (1994) and Bryman (2004) propose alternative criteria, namely, trustworthiness and authenticity.

According to Gary (1982) and Patton (2002), validity and reliability are central in any research endeavour regardless of the deployed methodology. Claire (2010) suggests that validity and reliability are increasingly perceived as important factors in qualitative research. Claire (2010) adds that when evaluating validity and reliability, the researcher is also assessing objectivity and credibility. Morse et al. (2002) argue that validity and reliability can be used with any paradigm as principal concepts. Hence, this research will use

validity, reliability and generalisability as quality criteria for the evaluation of data. The decision is based on two reasons. First, as Claire (2010) explains, using these criteria ensures covering other dimensions (objectivity and credibility). Second, due to the scope of the research and inability to examine political effects (authenticity) immediately following the project, it is infeasible to opt for the other proposed criteria.

It is important to note here that though this research opts for the Manson (2002) approach, the concepts of validity and reliability are used in accordance with the qualitative context. Connelly (2016) and Simon and Goes (n.d) explain that validity and reliability in qualitative research are presented as trustworthiness. Hence, this thesis should demonstrate quality through trustworthiness.

3.19.1 Trustworthiness

As mentioned above, trustworthiness is used to demonstrate the validity, reliability and generalisability of the research. According to Leung (2015), in qualitative research, validity means “appropriateness of the tools, processes, and data”. This includes the ‘appropriateness’ of the research question, methodology, design, sample, and results and conclusions. Mason (2002) clarifies that reliability in qualitative research refers to accuracy of the methods and techniques deployed by the research. Mason (2002) explains that generalisability is about making wider claims based on the research. However, though such wider claims are not common within qualitative research, Mason (2002) indicates that the research may generate ‘cross-contextual generalities’ or propose ‘a wider theoretical resonance’. According to Lincoln and Guba (1985), trustworthiness seeks to prove that research findings are ‘worth taking account of’. Polit-O’Hara and Beck (2010) refer to trustworthiness as the level of confidence in research method, data and interpretation. Trustworthiness consists of four criteria: credibility, transferability, dependability and confirmability.

3.19.1.1 Credibility

Polit-O'Hara and Beck (2010) indicate that credibility refers to confidence in research's truth and results. Connelly (2016) explains that credibility demonstrates whether the research deploys an approach typically used for such inquiries and whether variation is justified. According to Lincoln and Guba (1985), credibility can be achieved via, inter alia, activities like prolonged engagement, persistent observation and triangulation, peer debriefing, negative case analysis, referential adequacy and member checks. Bryman (2004) proposes following good practice and submitting findings for review by respondents and experts as ways to realise credibility.

3.19.1.2 Transferability

According to Gasson (2004), transferability is concerned with the extent to which conclusions can be transferred (generalized) and how these conclusions aid in formulating real theories. Bryman (2004) points to 'thick description', which Guba and Lincoln (1985) believe enables others to assess the possibility of transferring the findings to other contexts. Hence, detailed accounts of the context are necessary. Nevertheless, Eriksson and Kovalainen (2008) explain that transferability refers to the connection between the undertaken research and previous research based on similarities in contexts. Lincoln and Guba (1985) state that the researcher has only to provide the data upon which transferability can be tested by others. They emphasise having 'thick descriptions' to allow for transferability judgement.

3.19.1.3 Dependability

Gasson (2004) clarifies that dependability refers to whether the research process follows a consistent and sensibly steady manner over periods of time and between investigators. Marshall and Rossman (2006) show that the concept of dependability accounts for change either in the study's phenomenon or research design. This represents the essence of interpretive research, which believes reality is always constructed. Bryman (2004), Morrow (2005) and Connelly (2016) point to the importance of an 'audit trail'

or a “detailed chronology of research activities and processes” (Morrow, 2005). This can facilitate review and examinations by others (e.g. experts and colleagues). Lincoln and Guba (1985) demonstrate that dependability can be ensured by: realising credibility, deploying overlap methods, using stepwise replication, and auditing.

3.19.1.4 Confirmability

Per Connelly (2016), confirmability simply refers to neutrality in research. Marshall and Rossman (2006) describe it as removing evaluation from the researcher and placing it on data. Gasson (2004) shows that research conclusions should rely on the themes of and circumstances surrounding the study not the investigator. According to Eriksson and Kovalainen (2008), confirmability concerns relating conclusions and interpretations to data, while ensuring clarity for and easy understanding by others. Morrow (2005) and Bryman (2004) explain that because objectivity cannot be achieved in social research, there is a need to prove that the researchers’ theoretical positions or values do not impact the research process or findings. For the establishment of confirmability, Lincoln and Guba (1985) suggest the following: the confirmability trail, triangulation and keeping reflexive records.

The discussions throughout the different chapters of this research aim to demonstrate the trustworthiness of the work. Establishing a methodology based on earlier works and scholars, and seeking feedback from academics, colleagues and employees from the studied organization were among the measures to ensure credibility. Similarly, the ‘thick descriptions’ and accounts aim at demonstrating transferability. This detailed account, beside utilizing an insider outsider approach support dependability. All these together target confirmability.

3.20 Chapter Summary

The methodology chapter details the different aspects of research methodology, starting from research aim, objectives and questions. Then it addresses the philosophical underpinnings of the research, which forms the

basis for subsequent decisions regarding research design and strategy. The design, approach and strategy are then discussed, including the choice of data collection tool. The conversation continues to cover the formulation and review of interview questions. Following that, pilot testing is presented, demonstrating how it affected the process. Next, approach to analysis is summarised, showing how it was framed. The last part relates to research quality, which addresses trustworthiness.

Chapter 4: Analysis and Results

4.1 Chapter Overview

The previous chapter presented in detail the research approach to analysis. This chapter covers the process of analysis and introduces results. It starts by reviewing participants' profile and analysis approach in sections 4.2 and 4.3. It provides a detailed account of the analysis over three main sections, 4.4 through 4.6. Section 4.4 goes through the analysis over the impact of ISO implementation on resourcefulness. It discusses the main processes and attributes identified in Chapter 2 and shows how these are impacted by ISO implementation. Section 4.6, on the other hand, addresses the role of the organizational structure in this relationship. It reviews the different aspects of organizational structure and how they interact with ISO and resourcefulness. Section 4.7 summarises the results of the analysis from the two sections.

4.2 Participants' profile

Table 4.1 provides an overview of participants' profile. There were 32 participants involved with the data collection process, plus one final reflective interview with an experienced senior (insider) from the organization. The majority were males [24], while females represented a quarter [8] of the total number. In relation to years of experience, the minimum was 6 years while the maximum was 32 years. 30 participants had more than 10 years of work experience in MoE. All participants had witnessed the implementation of the ISO 9001 standard. 21 participants had a bachelor's degree, 9 a master's degree (2 were PhD researchers) and 1 a PhD degree. Only 1 participant had no university degree; he had a high school diploma.

Job titles within MoE are classified under three main categories: 1) executive employees (first line) of whom 14 participated, 2) supervisory employees (middle management) of whom 16 participated and 3) top management personnel of whom 2 participated. This classification is based on the national civil service law and defined by organizational structure. It forms the basis for appointment, ranking and promotion within the public sector. Therefore, a

good representation needs to include employees from all three groups. In terms of within-organization units, participants came from two DGs (DG1 and DG2) equally. DG1 was represented via its 3 departments (Quality control, Planning and Statistics), while DG2 was represented via its 4 departments (Human Resources, Transport and Services, Housing, and Employee Care).

Table 4.1: Participants' profile.

Gender	Experience/yrs	Qualification	DG	Duration/mns
M	16-20	PhD	1	40
F	11-15	M	1	46
M	11-15	M	1	45
M	16-20	M	1	40
M	11-15	Ba	1	74
M	21-25	Ba	2	25
M	11-15	Ba	2	54
M	16-20	M	1	25
F	16-20	Ba	1	34
F	6-10	Ba	2	30
M	30+	Ba	2	43
M	21-25	Ba	2	22
F	21-25	Ba	2	32
M	6-10	Ba	2	26
M	21-25	HSD	2	29
M	11-15	Ba	2	28
M	26-30	Ba	2	23
M	21-25	Ba	2	41
M	11-15	Ba	2	76
M	11-15	M	2	44
M	16-20	Ba	2	60
F	16-20	M	2	51
M	11-15	Ba	1	35
M	16-20	M	1	26
M	11-15	M	1	21
M	11-15	Ba	1	31
F	11-15	Ba	1	27
M	16-20	M	1	66
M	16-20	Ba	1	41
M	26-30	Ba	2	81
F	11-15	Ba	1	37
F	21-25	Ba	1	53
M	26-30	Ba	1	105

Source: Author.

To ensure a representative sample that serves the objectives of the study, purposive sampling was used to identify participants. The idea was to gather a sample of people who had both witnessed the implementation of the ISO 9001 standard (often referred to here as ISO or standard) from the very beginning and were familiar with the difficulties MoE had been through before and after the implementation. Sampling aimed also at ensuring the representation of all departments and ranks, with equal representation of both genders being a focus (more details are provided in Chapter 3). In general, 32 responses were collected for each question (16 per DG). Unless stated otherwise, proportions refer to these totals.

4.3 Results

This research implemented an insider-outsider approach (Louis, 1981: Gioia et al., 2010) (See Chapter 3 for more about the approach); hence, data analysis[7] was conducted over two separate periods. In the first phase, participants' responses were analysed and interpreted to find answers to the research questions. In the second phase, with the final interview finished, initial results were examined once again against the insights obtained from the reflective interview. The aim was to provide an inner knowledgeable voice to validate the findings of the analysis and have a holistic view to the context. The Director-General, referred to here as 'informer', commented on the results and findings of the study. The informer was selected based on his direct involvement in the planning, execution and evaluation of the quality management system in the organization, besides being there in a senior position for nearly a decade.

The Director-General heads the quality committee and as a senior member of the quality council, he was perceived the best nominee to reflect on the results and findings. He had been familiar with the situation before and after the implementation of the standard, besides his knowledge of the difficulties the

[7] Analysis started with comparing individual responses (based on job titles and ranks); however, this yielded disconnected and inconsistent results. Thus, analysis moved to comparing Departments and DGs.

organization had witnessed over years. However, the informer did not interfere in analysis, so no internal influence could be practised on the analysis process (Gioia et al., 2010). The informer's comments serve both as a source for better understanding and of verification of the findings. This in turn improved robustness and generated more trust in the double-checked conclusions.

In the following sections, the results are presented under the main research questions in a sequence aiming at ensuring ease and convenience for readers. Similarly, responses to the interview questions are presented based on the same approach[8].

4.4 ISO and resourcefulness

4.4.1 Problem identification and hazard prioritization

Regarding problem identification and hazard prioritization, the data showed that overall the organization did practise risk assessment (RA) techniques of identification and prioritization. Most participants [26] indicated that in their work they did practise risk assessment to some extent. The data also showed that risk assessment had developed over three stages in the organization. The concept of 'risk' was not used commonly a few years ago for people referred to them as challenges. Participant (3) explained: *"indeed, the department of planning used to deal with such events [risks]. But at the time these were referred to as challenges or by another name".* As stage 1 was ad-hoc, individuals/departments produced their own analysis rather than a consistent formal method which did not necessarily require any risk assessment. Some departments already had established a long term 'challenge' analysis. For example, Participant (32) demonstrated how her department had been involved in risk assessment for years: *"… preparedness for challenges is inherent in our work and life. When we hold projection sessions for 2020, 2030 and 2040 plans, we are practically predicting…".* At the same time, other departments did not have any procedures in place. In fact, it was introduced very recently: *"our*

[8] Beside the analysis undertaken in this thesis, the researcher was involved in two articles (see Appendices D and E for articles' drafts) submitted to a peer-reviewed journal. Altogether, the three analyses produce a more complete understanding of data.

work did not involve this [risk management]; this is introduced in the new ISO 9001:2015 standard" (Participant 17).

In stage 2, following the implementation of the ISO 9001:2008 standard, challenge prevention was introduced. Here, the concept started to be institutionalized throughout the units implementing the standard as Participant (2) said: *"after the implementation of the ISO 9001:2008 system, we have had the so-called preventive procedure relating to expecting and dealing with challenges…".* In stage 3, with the new ISO 9001:2015 standard, the organization explicitly introduced risk management, therefore, risk management was integrated into daily work. This change necessitated a different set of procedures. Participant (16) described the current practice: *"in this stage of ISO, we have to calculate the probability of risks for each procedure. The risks are identified, so in case we come across any issue, it is already considered, and alternatives defined…".*

However, when breaking down the data by DGs, a big difference appeared. All DG1 Participants [16] indicated they practised risk assessment while the figure for DG2 was less by more than a third [10]. Participant (18) from DG2 said: *"for every action, there is a reaction. No plans are in place, and solutions need to be identified when the problem strikes. The same issue might reoccur again. It is about the culture coming from the useless routine-based management".* The informer supported the result, referring the difference between responses to the organizational structure: *"risk assessment has become a genuine part of the environment emphasized by ISO and SWOT analyses. It is necessary to assess opportunities and threats. Again, the nature of tasks and specializations play a role in the visibility of risks".*

4.4.1.1 ISO 9001 impact

In relation to the impact ISO had had on risk assessment, the results provided two different outcomes, each relating to one of the two versions implemented subsequently: ISO 9001:2008 and ISO 9001:2015. On average, around half of the participants [17], stated that the implementation of the 2008 version of the standard had positively impacted risk assessment within MoE. The first impact was represented by the introduction of risk prediction and assessment:

"before the implementation of the ISO system, this [risk assessment] was not practised. Issues were discussed after they happened" (Participant 16). Another impact was the institutionalisation of a new mindset, continuity of operation, Participant (20) clarified: *"honestly, it [ISO] has opened employees' mind by systematically identifying the problems. Some employees would just sit idle when faced by a problem, but ISO requires finding a solution. In fact, many problems have been solved".* Also, a notable impact is enhancing visibility, internal transparency. Rules, roles, responsibility and procedures were visible and clear, according to the responses: *"though this was practised before ISO, the process did not enjoy the same level of visibility… ISO have added more control over the process in terms of time"* (Participant 11).

With the ISO 9001:2015 version, there was appreciatively improvement with 23 of the participants' perceiving positive impacts from the implementation of the latest version on risk assessment. The first and major impact was the explicit introduction of risk management. According to Participant 4:

"recently, with the implementation of the new version of the quality management system [ISO 2015:9001], the new concept of risk management has been introduced. This is a new concept and shocked some of the employees, who wondered why to talk about risk management. The new standard adopts risk management as a strategic concept and pushes toward identifying and analysing risks and defining response measures".

Another impact referred to by participants was enhancing the existing risk management capabilities: *"ISO informs you and requires a plan. I am talking about my section, where the latest version has developed us by focusing on challenges and potential risks"* (Participant 18). In addition to these impacts, participants reported similar impacts to those of the previous version of the standard. The remaining participants believed ISO implementation had had no impact on risk assessment capabilities within the organization.

When breaking the data down by DG and considering the 2008 and 2015 versions of the standard, the figures for DG1 improved by one third from 6 to 9 (responses) with the latest version. Similarly, the figures for DG2 improved from 11 to 14. The informer confirmed the positive effect ISO implementation had on risk assessment describing it as an organizing system: *"risk assessment*

has become clearer and timely. The prediction of the risk timing has become more accurate and responses improved. We moved from an unsystematic approach to a more reliable one. We have improved and become more capable".

4.4.2 Resource mobilization

The data demonstrated that the studied organization was actively engaged in resource mobilization with a consensus between participants. According to participants, this was seen in four main behaviours: seeking financial support, collaboration to achieve goals, increasing efficiency and dealing with crisis. A few participants reported engagement in partnerships to mobilize financial support. Others indicated that MoE was also engaged in partnerships that facilitated its mandate and accomplished its role within the public and private sectors. This aimed mainly at ensuring goal attainment. Participant (4) explained:

"actually, in general the ministry is engaged in partnerships to realize both financial and non-financial benefits. For example, the science festival was organized in collaboration with the private sector. There are also partnerships in relation to non-financial and scientific aspects; we can mention exchange of expertise with Sultan Qaboos University".

The other aspect referred to increasing the efficiency of the organization. The following example by Participant (1) presented a good case:

"… when implementing the internal auditing system, it costed around O.R. 12,000 annually. After the expansion, it would have costed O.R. 35,000. We thought of how to reduce that and redesigned the audits while making sure the system is kept untouched. The new cost after the expansion is O.R. 9,500".

The last aspect indicated by participants referred to mobilizing resources in times of difficulty: *"...due to the recent financial recession caused by the decline in oil prices, we have sought other sources. Hence, we concluded agreements with organizations from the private sector. Via these organizations, we provided the necessary funding for our programmes…"* (Participant 12).

It was noted that participants raised two issues in relation to resource mobilization, namely, bureaucratic restrictions and insufficient resources. The first referred to the rules and procedures governing the issue, as Participant (27) clarified:

"… there are restrictions within the ministry affecting the possibility of having a partnership. If I would like to look for a company or organization to support me financially, the department does not get the funds, rather these are deposited in the ministry's bank account. Then, these cannot be used for anything else but the agreed upon project…".

The other concern referred to the insufficiency of the support due to the size of the organization: *"…we have a dedicated department – Department of Employee Care -, which has to provide support for a big number of employees. They cannot even provide support for basic things; it is a complex formula…"* (Participant 19). Overall, the informer embraced the result adding a new dimension regarding enhancing private education as a mean to ease pressure on the public system:

"first, we worked to improve efficiency. Things that costed 100, cost 70 now. We had a partnership with the International Bank and the Ministry of Finance to improve efficiency. We started the implementation of the recommendations of that study. Even in terms of student to teacher ratio, we are revaluating the situation. We have also started partnerships with companies like Petroleum Development Oman (PDO) to provide human resources, scholarships and buildings. We also granted support for private schools to relief the pressure on the public system. There is also an intent to grant governmental buildings as long-term investments".

4.4.2.1 ISO Impact

The responses about the impact of the standard on resource mobilization yielded somewhat similar results in terms of both positive and negative effects. The main positive impact was improved efficiency either in terms of financial costs or efforts involved. Participant (7) said:

"one of our sections used more than 50-60 paper bundles every week. After the implementation of the ISO standard, this was reduced, and the paper disappeared. For example, in the past they used to ask for 5 hard copies, now they require 1 sent electronically via the online platform. Hence, less paper, therefore, less ink is used. We started to dispense some printers or move them to other sections. The cost went down, and employees have become more aware of ways to improve efficiency".

The other notable positive impact was improved organization of work. This referred to having visible and clear rules, roles, responsibility and procedures: *"as every procedure and work is determined within set time frameworks, no time is wasted looking for an item, since it is supposed everything is documented. Paper and file encoding facilitate retrieval. ISO saved some time and effort"* (Participant 32).

On the other hand, just three people believed that the implementation of the standard had negatively impacted resource mobilization by decreasing efficiency, Participant (31) indicated: *"ISO has increased paper consumption. These papers are hung during audit periods like certificates. There is another paper we get to read and keep. We also get another paper to sign".* Another major group of participants [15] perceived ISO 9001 implementation to have no effect on resource mobilization. The main apparent reason was not being an ISO focus: *"audits do not focus on improving efficiency or work. The focus is on already existing projects. Therefore, cost has not changed"* (Participant 3). Others believed ISO was irrelevant as it was only concerned with conformance, Participant (29) said: *"ISO has not made any impact as it is concerned with conformance, but it controls time…".* Others suggested this was how people within the organizational environment viewed the standard. It was related to the understanding of the system and its aim: *"there is no impact. The system seeks to achieve that, but the reality is different. This is due to the lack of understanding of the concept of quality. It is understood as mere procedures"* (Participant 20).

Overall, the impact of ISO on resource mobilization was partial with half of the participants suggesting that. When breaking the figures down by DGs, no changes were observed. The Informer emphasised ISO's role in creating soft savings through organization of work and time:

"ISO is yet to pay back in terms of hard savings. However, it contributed to work and time organization, which is saving. In the last external report, we started to focus on effectiveness and efficiency whereas before it was all about compliance. We head now toward added value".

4.4.3 Organisational learning

Respondents indicated high level of organisational learning within their working environments. Out of 31 responses, 28 were reassuring about the practice of organisational learning within their departments and sections. About this, Participant (10) said: *"definitely we do practise that [organisational learning]. We even conduct workshops to learn from previous lessons and avoid earlier issues. Yes, that's practised"*. The responses showed that organisational learning was taking place at four parallel levels: personal, departmental,

organisational and cross-organisational levels. Participant (2) showed how this learning was reflected on her own work and professional development:

"…when I update my process for next year [2018], I do that based on the pros and cons observed while performing the process [in 2017]. I look through the steps…If a step involved a risk, it would obstruct my work if not analysed and eliminated…".

Similarly, Participant (26) described how organisational learning took place at the departmental level: *"yes, that's practised. We had certain criteria for specific functions. To make sure these provide future projections, we changed them. We also introduced changes to facilitate risk management. This is an ongoing process, as we always learn lessons"*. At the organisational level, departments made use of the pool of knowledge available. Participant (15) talked about this aspect: *"…When a department implements an initiative, you would like to avoid any problems they came across. We make use of the experiences of other departments. When any successful initiative is led by others, we look for similar paths"*. It seemed that the organisational learning chain extended beyond the boundaries of the organisation. MoE cooperated with other public organizations to ensure exchanging of experiences and knowledge. In fact, it did not only cross the organisational boundaries as the responses showed that it also crossed geographical boundaries too. According to Participant (2):

"we practise that both internally and externally. For our department or honestly for our DG [DG1], we do exchange expertise with other organisations implementing quality management systems. We either invite them or visit them. We have visited Tunisia, UAE and Saudi Arabia to learn from their experiences".

Participant (27), pointed to an interesting fact regarding organisational learning by linking it to resilience:

"…In case we are encountered by a crisis or risk, we work internally to find an improvement or alternative. For example, we came across problems with the printing of statistical books. Hence, we were forced to reduce the number of printed copies. We established an internal designing team and made savings. We try our best to adapt to challenges".

On the other hand, Participant (18) stated that organisational learning was not institutionalised in the working environment: *"we as a section, learn from our past lessons to avoid the same problems. However, these are personal efforts by the head of section and the employees, not a culture"*. Only three participants believed that organisational learning was missing in their units. Participant (6) briefly said:

"this culture does not exist among employees. Employees do not want to look for the right way to perform a job".

No notable difference was observed when breaking down the data by DGs, though DG2 remained slightly better than DG1. The informer's reflection backed the result; however, he linked the enhanced learning to ISO's operations: *"ISO auditing results in cases of non-conformance, good applications and improvement opportunities; these are learning opportunities. We focus on good applications"*.

4.4.3.1 ISO Impact

When asked about the impact of ISO implementation on organisational learning, two thirds of responses [21/31] reported positive effects. These gains were perceived in various aspects within the organisation. It was believed that the standard enhanced visibility, which improved employees' understanding of their activities and facilitated organisational learning: *"…The employee understands the whole process. Hence, when tasked with a new unfamiliar mission, ISO had already forced you to prepare for such issues to avoid a non-conformance"* Participant (8). Another positive impact was the emphasis on data and facts. Participant (7) elaborated on the matter:

"…there were a lot of training courses, which were not necessarily aligned to the real needs of employees. You would be shocked to see irrelevant people within a course. After the implementation of the ISO system, the training needs, training course and participants are determined based on criteria".

Follow-up and feedback by ISO were perceived to play a positive role in organizational learning. According to Participant (10): *"…if an employee does not meet the criteria in terms of performance, he is notified. As a result, the employee becomes more vigilant and seeks continuous improvement. Therefore, they learn from any shortcoming"*.

Respondents believed that the standard necessitated organisational learning as part of its continuous improvement cycle, as expressed in the following quote: *"ISO has explicitly stated corrective actions. So, through analysis of root causes of problems and non-conformance cases, better decision-making can be made. ISO has played a role. ISO has contextualised learning to a great extent"*

(Participant 3). Another group of participants showed that ISO implementation had enhanced organisational learning within their environments: *"…ISO has contextualised and developed learning. Any corrective action or improvement card necessitates follow-up by the department. They should report how they dealt with the issue. When matters are contextualised, they become clear and show you the way …"* (Participant 32).

One positive impact was the institutionalisation of organizational learning within the organisation. In other words, it moved from being efforts carried on an individual basis to an established organisational requirement. Participant (22) said: *"before the implementation of the system [ISO], these were mere individual efforts across the Directorate-Generals. We had different templates, while tasks overlapped due to the lack of clarity. ISO has organised learning"*. Although documentation required by ISO had been perceived by many as a burden, some participants looked at it as key for organisational learning. It seemed documentation had led to more access to organisational knowledge, resulting in enhanced learning. Participant (4) provided more insights: *"over the last years, electronic data replaced paperwork. This has accumulated expertise and knowledge that can be referred to by decision-makers…"*. Participant (25) pointed to exposure to experiences during audits across the organisation. Internal auditors took the gained lessons and expertise to their departments: *"when I audit other departments, I become familiar with their work. I have accumulated expertise…"*. In organisational learning, an important practice is ensuring the gained knowledge is integrated into work. This was reported by Participant (1) as an impact of ISO implementation.

"yes, when a problem is identified in any Directorate-General, it is reported to all other Directorate-Generals as a preventive measure. The same applies for good practises…For example, in one DG rain water leaked into the store and damaged the stored materials. Based on the ISO system, new criteria were defined for stores".

The rest of participants perceived no impact for ISO implementation on organisational learning, mainly because their units did practise organisational learning before implementing the standard. Another perspective linked organisational learning to the nature of people, who were thought to be cooperative. No notable difference was detected when breaking down the

data by DGs. The informer provided evidence on ISO's role in relation to organizational learning, further supporting the result: *"the system [ISO] assesses learning as well. This is evident as we have issued the fourth or fifth update in some processes. These were based on improvement opportunities"*.

4.4.4 Sensemaking

With almost a consensus [31/32], responses displayed that sensemaking was heavily practised across the organisation. Participants identified five main drivers for sensemaking, namely, the voice of the beneficiary (voice of customer), engagement, consultation, fact-based decision-making and continuity of operation. Respondents revealed a shift over last years toward beneficiary-centricity. This necessitated more sensemaking to meet the requirements of the beneficiary, whether it was an internal or external one: *"now, with the ISO system, the focus is beneficiary satisfaction. We apply a survey that forms the basis for decision-making…We hold a section-level problem-solving meeting, where we discuss the causes and who caused the problem"* (Participant 22). Participant (30) perceived engagement as a major stimulator of sensemaking. He insisted that decisions based on inputs coming from first line employees were more robust:

"it is important to engage others, so they contribute… we do practise that [sensemaking] in our work environment…any work coming from the bottom is more robust. In the past, the system was based on orders coming from the top going to the bottom…".

Consultation formed almost two thirds of sensemaking cases reported by participants. It formed the basis for understanding the issues, setting alternatives and solving the problem or seizing the opportunity. Participant (18) provided the following answer: *"it is necessary to understand the existing situation and then a decision is made. Ad-lib decisions cannot be made since there will be legal and administrative consequences. We refer to the appropriate person".*

According to respondents, fact-based decision-making encouraged sensemaking. The responses showed that sensemaking had become a common practice for fact-based decision-making: *"sensemaking has to be based on facts, figures and stats, so the decision-maker can evaluate the proposal. Thus, the decision will be based on facts, figures and evidence. When we discover a*

problem, it is necessary to solve it…" (Participant 3). Continuity of operation was the last driver of sensemaking mentioned by participants. As the focus had moved toward ensuring operation was not interrupted, sensemaking was instrumental both to find the problem and set temporary or permanent solutions, Participant (1) elaborated: *"the focus is on continuity of operation, and then root causes are investigated because the priority is ensuring beneficiaries keep receiving the service. Therefore, alternative provisions are determined before moving to analysis of root causes…".*

Splitting the data by DG showed no differences, except it did indicate more emphasis on fact-based decision-making within DG1. The informer, who supported the results, stressed the central role facts played in the organization, which enhanced sensemaking:

"yes, sensemaking is a common feature, but not the only one. It is particularly used for strategic decisions. We have the department of statistics which provides facts for decision-making. For example, in 2030, we will have a million students in comparison to 600,000 now. Hence, we establish our decisions upon this fact".

4.4.4.1 ISO Impact

When asked about the impact of ISO implementation on sensemaking, around two thirds of respondents identified positive effects. The first impact was listening to the voice of the beneficiary. According to Participant (28): *"There was no prior investigation for beneficiary requirements… With ISO, beneficiary requirements must be defined prior to the event. It is a requirement for all departments"*. Similarly, responses revealed that ISO implementation had institutionalised sensemaking into the work culture and procedures. This was reinforced by the requirements which failing to realize would be considered a non-conformance. It could be inferred here that decision-making became more organized and systematic after ISO implementation.

"ISO has provided procedures that ensure sensemaking takes place, like reviewing the whole file before making a decision…Before ISO implementation, we were not obliged to go through all that… we are obliged now to do all the reviews within a specified period before sending the file to leadership for adoption" (Participant 7).

Another ISO-related impact was follow-up. Participants believed that the follow-up process introduced by ISO encouraged sensemaking as employees strived to avoid any non-conformance. Employees sought solution based on consultation, meetings and reviews. Participant (19) clarified:

"definitely ISO has an impact because it follows the procedures. When the auditor comes, he asks for the organisational chart of the procedure…The follow-up is based on your chart. If it shows that you did not perform a specific act, this is considered a clear violation of rules".

Responses also praised ISO for encouraging fact-based decision-making, which was believed to be a main stimulator of sensemaking, as Participant (4) expressed: *"decisions within the DGs implementing ISO have changed into fact-based. They review KPIs[9] and audit results"*. A relevant impact was improved visibility, which was thought to have resulted from the fact-based approach and organisation which ISO had introduced. With improved visibility, sensemaking became possible as everyone could derive and interpret data. Participant (32) said: *"yes, ISO has had a very very notable impact. This is what I said from the beginning. Everything is now clear and visible. Everything that goes around is detectable"*. In relation to organization, Participant (8) explained: *"ISO has taught us that decision-making goes through systematic phases, not randomly"*.

The rest of participants [12] believed ISO had had no impact on sensemaking. Of them, 7 indicated they had practised sensemaking prior to the introduction of the standard. Most of the latter group came from DG1 [6/7]. Other than that, no real difference was observed between participants coming from the two DGs. The informer perceived ISO to contribute to the culture of sensemaking while ensuring this had been a common feature even before implementing the system: *"it is true; ISO has played a major role. That is a fact. Nevertheless, during the diagnosis phase, they told us that there was spontaneous implementation of quality principles based on individual efforts. For us, facts are essential"*.

[9] Key Performance Indicators.

4.4.5 Self-organization

All participants indicated that self-organisation was practiced throughout all units in the organisation. The main driver behind this mindset was continuity of operation, which seemed to be a focus for the whole organisation: *"…When any sub-unit is terminated, service still can be delivered. For example, if a printer in the Department of Quality breaks down, another alternative needs to be found. ISO encourages finding solutions immediately"* (Participant 1). The responses also revealed several techniques that built-in self-organization. The first of these was flexibility. Participant (10) said: *"we have highly effective flexibility. In case the online systems stop working, we move to paper work"*. Participant (25), on the other hand, showed that this flexibility is exercised organisation-wide: *"we are flexible, and this flexibility is widely practised within the ministry"*.

Besides flexibility, collaboration or teamwork played a major role as a self-organisation method. In fact, it was the most mentioned technique in relation to self-organization. Units, subunits or employees would join efforts to overcome difficulties. Participant (6) provided the following example: *"yes, we do practise that [self-organization] here. For example, if we come across any problem when it comes to furniture distribution, we have enough employees deployed according to our needs. People from other sub-units cooperate"*. Some participants pointed to creativity and innovation as self-organising methods. In situations where neither flexibility nor collaboration from other intra-organizational units work, new ideas were required:

"…we never stopped because of any obstacle. We always strived for adaptability and looked for new activities. In our annual strategy, we had identified a set of initiatives, but the financial crisis was an obstruction. However, we worked on other activities. We mobilize resources by advertising the products of partners among employees, while we get something in return" (Participant 11).

Responses demonstrated a planned pattern for self-organization capabilities within the organization. This was achieved directly through assigning substitutes and alternative approaches as Participant (21) explained: *"this is organised by identifying substitutes… in one of our sub-units we have 5 employees. If one or more are absent, work does not stop…"*. Also, indirect means were used to ensure departments and sections were self-organising. This was introduced

via job rotation as expressed by Participant (15): *"…I recall that the head of the services section was moved to the housing section, while the head of housing was moved to transportation and so on. We had difficulties and managed to overcome because people could be replaced…"*. Participant (5) introduced a different perspective by referring self-organization to the capabilities of employees. He argued that they were the ones who managed to overcome any problem: *"I can tell that we, the employees within our section, have an ability to adapt and overcome any episodic events at all levels. In case there is pressure, shortage or lack of knowledge, the employees can find solutions"*.

Amid all the positive responses, some participants pointed out three main issues, namely, resistance from employees or decision-makers, leader or manager's role and lack of cohesion between departments. These may have limited self-organising capabilities and established inconsistency throughout the organization. According to Participant (24): *"at the department level, we can do that, but outside it we cannot help. We are separated; we don't know what is going there and they don't know what is going here"*. The informer reinforced the result commenting that: *"there is a main plan and an emergency plan. I agree with this result; self-organization leads to the realization of outputs, which is key for development and outcome attainment"*.

4.4.5.1 ISO Impact

Out of 31 responses, 16 recognised that ISO implementation had positively impacted self-organisation. These effects were identified in various forms, with the first being introducing a mentality shift: *"…After implementing ISO, employees' perceptions started to expand, and they began to think about finding solutions. Employees now predict, which makes them ready for challenges"* (Participant 1). It seemed ISO had also impacted self-organising capabilities by making it a requirement. Every unit and employee must have included it in their planning and work and be ready for audits in respect to self-organisation. According to Participant (13): *"yes, this is an ISO requirement. ISO emphasises preparedness for challenges and improvement. Therefore, the department seeks to find alternatives in coordination with top management. When this cannot be provided immediately, we deal with the challenge or opportunity internally"*.

Another way participants believed the standard affected self-organization was through enhanced visibility of role assignment and ownership. Having the roles of people clearly set and documented meant others could replace them with more ease: *"ISO plays a role by setting and illustrating work steps in other sections. I can understand the work via its scheme. Therefore, I can provide support"* (Participant 26). Ownership, on the other hand, meant that the employee, who was supposed to be the best to understand his work, would analyse the procedures and set self-organising measures: *"there was a lack of clarity before the implementation of ISO. Now and with risk management, the employee as a process owner identifies the risks and determines alternatives. The system necessitates that"* (Participant 4).

One of the main features ISO had introduced was KPI-based performance management. With ISO, these KPIs were obligatory and showed the source of any problem (e.g. delay). Thus, it provided measures for both self and teamwork evaluation: *"it [ISO] has an effect since the employee adheres to set rules and whenever he makes a mistake, he evaluates himself…"* (Participant 30). At the same time, these KPIs created urgency to stay within set measures and establish emergency plans in case something went wrong: *"a delay means you get a non-conformance; this creates pressure to stay within the specification limits"* (Participants 9).

Participant (28) believed that the standard institutionalised self-organisation within the organisation. In other words, it moved it from being randomly and individually adopted to systematically implemented: *"let's not underestimate the previous efforts, but these were ad-lib. Now, the system [ISO] requires clear documents in this regard. That is evident through the flexibility we observe here every year"*. The last positive impact of ISO seemed to come indirectly from its reports. Employees highly appreciated recognition of their work in these reports. It was perceived both a source of pride and an incentive for more effort. According to Participant (10): *"this is an achievement for our section. The evaluation covers the procedure from start to end. The Department of Quality is watching us; we don't want to get a non-conformance"*.

On the other hand, only 2 participants believed ISO implementation had hampered self-organisation because the standard was rigid and limited job rotation, the participants alleged. Participant 15 gave an example: *"the ISO team is against multidisciplinarity and rotation. They found an employee from another section here and asked him to go back to his original section"*. The rest of participants [12] perceived no impact for ISO on self-organisation, with half of them indicating that their departments had practised self-organization before ISO implementation: *"this can be attributed to people and the work environment. It has been instilled in the employee to find a way to progress with work"* (Participant 2).

In general, no differences were observed between the DGs, though, in DG2 slightly more people indicated that ISO had impacted, with two thirds of the participants saying so. The informer believed ISO had an impact through its documentation requirements: *"it is true that ISO has an effect, especially as risk management requires the documentation of alternative methods"*.

4.4.6 Creativity and innovation

Most participants [23/32] acknowledged that creativity and innovation were practised within their units, with most of them ensuring the availability of an open virtual space for creativity and innovation. When asked whether the organization practically supported creativity and innovation, Participant (12) answered: *"all means that facilitate creativity are provided, so employees can create something new in their work"*. Participant (13) shared an example of an innovation by a colleague: *"quality-related messages used to lag behind in terms of achievement. An employee innovated an electronic system that connects quality specialists across the sections. No more we need to go to every section, as the app cuts time and efforts…"*.

During the interviews, participants raised several topics relating to creativity and innovation. The first was the mindset shift after the introduction of ISO. According to Participant (7): *"before ISO, there was little creativity. In fact, those were minor observations. Perhaps people did not pay attention to creativity and innovation as the prevailing thought was to come in the morning, finish your work and*

leave…". Another observation related to how creativity and innovation were contextualised within the organisational culture. The assumption here was that ISO provided a framework for creativity and innovation to be communicated, applied and rewarded: *"before the system [ISO], there was no framework for creativity and innovation. Now we have what we call good practises, which are collected and analysed. Later, the innovation is adopted and generalised across the organisation"* (Participant 1).

A group of participants indicated that creativity and innovation were personal. In other words, these were individual efforts and could not result from organizational policies, although they admitted the space was open for creativity and innovation. Participant (20) said: *"the space is open for everyone to create and innovate, but we are back to individual differences. Some have the desire, ability and acceptance (e.g. managers) and others do not"*. One last group pointed to the restrictions and difficulties a creative or innovative idea might face. These related either to bureaucratic procedures, technical difficulties or financial problems. The later seemed to intensify with the current financial crisis. Participant (27), for example, talked about technical difficulties that affected the pursuit of creativity and innovation: *"…seniors encourage me to have new ideas and innovations…however, we face challenges and they ignore these challenges…they keep asking, while we cannot do anything about the challenges we face. These challenges sometimes obstruct innovation"*.

In contrast, the remaining 9 participants believed creativity and innovation were not really practised within the organization. These participants had a very negative attitude of how creativity and innovation were managed within their respective units: *"on a scale from 1 to 10, I would say 0; in fact, it should be a negative figure. Proposals are not adopted, and the same proposals are presented every year. It's like begging. Senior managers are in a different world…"* (Participant 18). It seems that three main reasons were behind the negative attitude of this group. First, they indicated that management did not pay sufficient attention to creativity and innovation, as Participant (24) suggested: *"you work for the ministry and know how it works. There is no space for creativity and innovation…you never feel there is great attention paid to this aspect, unless it is an extremely*

exceptional case". Second, participants claimed that workload narrowed the space for creativity and innovation: *"workload does not allow space for creativity and innovation. We must work with managers even after working hours through personal contact. Look at the interruptions we have had here"* (Participant 21). Participant (3) highlighted the third reason, which was absence of rewards: *"we suffer from the absence of rewards here. No incentives are given to encourage employees toward having new ideas and initiatives…it is not clear, and employees are not encouraged to present innovations and initiatives to advance work"*.

The different perspectives on creativity and innovation might have come from the way the organisation approached the matter. It seemed they perceived standardisation and creativity to be opposites that cannot coexist. According to Participant (28): *"we are between two opposites, to standardize or allow space for creativity. Creativity is relative and must relate to work. It should not go far away and should be reached by agreement and consensus"*.

Overall, no differences were observed between the DGs. However, participants who attributed creativity and innovation to personal traits and those who believed no space for creativity and innovation was available came from DG2. This seemed a cultural and technical issue within DG2 as unlike many people from DG1 who, for example, looked at the ISO framework as a platform to report creativity and innovation, people from DG2 seemed to lack such a mechanism. Although the informer agreed that creativity and innovation were practised in the organization, he did not agree with respondents in terms of the extent of practice due to the absence of a system dedicated to creativity and innovation:

"in the departments of quality and statistics, in the Directorate-General of Planning [DG1], there is development and innovation to keep pace with technology. By integrating technology, we came out with good applications. It is there, but not very common. However, reporting creative and innovative ideas is possible whether directly or indirectly. But we still do not have a unit dedicated to that, though we started such an initiative at the school level. The newly established section of continuous improvement will assume this role".

4.4.6.1 ISO Impact

Slightly more than half of the respondents [17/32] agreed that ISO implementation had had a positive impact on creativity and innovation within the organization. The first impact was encouraging creativity and innovation: *"there is encouragement toward creativity and innovation. We definitely have routine works, but the Department of Quality promotes innovation…"* (Participant 13). At the same time, Participant (10) explained that the standard contextualised creativity and innovation into the organisational culture by recognising best practices: *"ISO always plays a role since these [creativity and innovation] are recognised as a credit for our section"*. Also, according to participants, ISO implementation organised work flow and reduced workload, which provided more space to create and innovate: *"employees have space to create and innovate as there is less workload now. The work environment is somewhat encouraging"* (Participant 4).

One important impact apparently ISO introduced came through one of its fundamental concepts, continuous improvement. This enabled introducing change, which allowed for creativity and innovation to take place: *"since ISO is based on continuous improvement, specially the PDCA cycle, it diffused this culture among employees…The employee understands now that his daily routine is a continuous cycle, so he has to choose whether to develop or stay static"* (Participant 4). The last aspect ISO was thought to have affected creativity and innovation was through recognition. Around one-third of those believing ISO had positively impacted creativity and innovation attributed it to recognition. This indirectly encouraged people to introduce new ideas as this would be reflected as an added value for both them and their unit: *"indeed it [ISO] has had an impact. It created a competitive spirit and a desire to achieve the highest scores during the internal and external audits"* (Participant 30).

The rest of participants [15/32], nearly half, perceived ISO implementation to have had no impact on creativity and innovation. Many believed ISO was irrelevant as it focused on conformance to standards. According to Participant (11): *"no role for ISO at all. In fact, ISO does not even mention innovation"*. A second

group attributed ISO's lack of impact to workload, which allowed no time to be allocated for additional initiatives: *"…honestly, with the huge workload and shortage in employees, we have no time to think about something else. We hardly manage to finish our routine work and deal with mails…ISO somewhat organised the time, but workload is still huge"* (Participant 24). Participant (17) referred to both bureaucratic, technical and financial difficulties as main barriers to creativity and innovation efforts. These seemed to discourage such initiatives:

"ISO asks for creativity and innovation; however, it is restricted to a particular process… it does not address required human resources, items or other aspects. For example, to overcome centralization, you may think of innovating an electronic system or an application. This requires approvals, funds and other resources. It's not easy".

The last group pointed to leadership and management as the decisive factor when it came to creativity and innovation. Whatever a system required, the manager/leader decided how to approach it. Participant (3) explained: *"…it depends on the unit itself. It differs as some sections encourage employees to innovate, while others are dead. The later are just executives performing routine work. Other sections initiate innovations by their own"*.

When breaking down the data by DGs, creativity and innovation in DG2 appeared more prevalent after ISO implementation, with 10 responses indicating so, in comparison to 7 in DG1. It is worth noting that apparently the people from DG1 and DG2 had different conceptions for creativity and innovation. Again, it seemed that no unified system or mechanism was in place to facilitate these aspects. The informer explained that ISO's somewhat ineffective impact was due to the focus of the present implementation plan: *"ISO has played a role, but we still need time. We have been focusing on compliance and have just started continuous improvement. From next year, the focus will be continuous improvement and added value"*.

4.4.7 Entrepreneurial spirit

In response to the question over entrepreneurial spirit, many participants [24/32] indicated entrepreneurial spirit was prevalent within their organizational units, providing several examples, of which one is quoted below.

"…when ISO was first implemented, there was resistance. Some employees voluntarily offered to help with the matter. A girl with good knowledge in quality offered holding workshops and explaining the new concepts to those resisting, since the system was ambiguous and unclear. Another employee offered establishing a shared electronic system for the department. Quality files are uploaded to the system, so no papers are used. This was also a voluntarily individual initiative" (Participant 7).

The responses provided insights on how entrepreneurial spirit flourished in the organizational context. According to Participant (2), the environment provided an open space for entrepreneurial initiatives: *"the employee has the freedom. You can think and create new ideas, either in your own domain of work or you can contribute to other Directorate-Generals"*. Added to that, responses indicated that the environment encouraged entrepreneurial spirit. Participant (2) explained how that was encouraged: *"they encourage you and give you more ideas. Sometimes, if the initiative relates to work and is thought to improve and develop it, a budget might be provided"*. A third perspective linked entrepreneurial spirit to recognition as Participant (1) pointed out: *"the ISO system created positive competition among employees. The employee seeks to highlight her/his new achievement, so leadership recognises it"*.

Several responses agreed that entrepreneurial spirit was a personal trait. They believed that it was determined by employees' own desire and perspectives, as some focused only on routine work duties: *"entrepreneurial spirit is definitely practised, but it depends on the employee her/himself. Some employees are initiative-takers and others do whatever they are asked to do. Some continuously strive for improvement and innovation in the work environment"* (Participant 30). A possible solution to this inconsistency was suggested by Participant (4), who believed an aligned incentive system might have further encouraged entrepreneurial spirit: *"entrepreneurial spirit is observed, but there are individual differences. The big challenge here is having a reward system. The current system is routine-based, with no incentives. Perhaps, if the system is developed, it will motivate and highlight more initiatives"*. This perspective looked very sound and logical, especially when connected to other inputs in relation to motivation

behind entrepreneurial spirit. According to Participants (23) and (5), respectively, sense of engagement and inspiration by a colleague are the main motives: *"the initiatives from employees and management are great. We always feel this is our second home. There are initiatives to overcome financial or technical problems. It can be initiated by the person facing the issue or others"*; *"…This was started because one employee enjoyed this characteristic and the rest sought to match his level…This has created positive competition among employees"*.

Some participants pointed to the barriers entrepreneurial spirit had faced in the work environment, namely, bureaucracy, workload and lack of support from top management: *"you cannot initiate a resource-mobilization project. This relates to the work of another section. Every section has its own role. We can only propose…"* (Participant 14).

In contrast, the remaining quarter of participants [8] suggested the absence of entrepreneurship. Participants identified many reasons. According to Participant (18), the environment did not support such initiatives: *"these are individual efforts, not a culture. That's because the environment provides no encouragement"*. Another group referred it to workload, as Participant (22) indicated: *"entrepreneurial spirit is not practised due to the high workload"*. Another perspective accused bureaucracy of obstructing entrepreneurship among employees. The organizational structure in this case limited the role an employee, a section or even a department could play: *"not accepted. Let's talk about our DG [DG2]. We have a department dedicated to resource mobilization...Therefore, it's not accepted from me to take over their role, as that's out of my scope"* (Participant 16). Participant (17) highlighted a unique reason behind the absence of entrepreneurial spirit within his unit. He supposed the lack of training and emphasis on routine procedures played a role: *"…employees require training to be able to introduce new ideas. Working on boring daily routine works cannot help here…An employee might introduce ideas and innovations, but another department might end that due to financial cost"*.

Breaking down the results by DGs showed that DG1 was slightly more familiar with entrepreneurial spirit than DG2. The results also demonstrated that, to some extent, in DG1 entrepreneurial spirit had resulted from engagement and

inspiration, while in DG2 it was more perceived a way to overcome problems. Notably, bureaucratic barriers were more common within DG2, as well as, absence of an encouraging environment. Again, the informer agreed on the presence of entrepreneurial spirit in the organization but disagreed with responses on its scale: *"not on large scale; it is accepted. We have found external resources for some initiatives"*.

4.4.7.1 ISO Impact

Investigating how ISO implementation had impacted entrepreneurial spirit showed little impact from the standard. Only 9 out of 31 respondents thought the standard provided positive impact. The first impact was believed to be introducing a mentality shift through the principle of change. Participant (7) provided more details: *"…There was a conviction that change was difficult, especially when you knew that some procedures had existed for more than 30 years. When ISO introduced change, this looked strange and employees understood that change was possible; ideas followed"*. Another impact came through process ownership, according to Participant (4). Any improvement in the process was referred to its owners, hence employees looked for major impact: *"Now the director as a process owner is responsible. Therefore, any development initiative will be reflected on her/him. Thus, developments are continuously introduced. I think this is the impact"*. The responses also accredited the ISO standard for saving time and effort, which provided more space for entrepreneurial spirit: *"…The ISO standard allowed for better organization of work. This in turn allowed time to think of issues beyond regular work"* (Participant 8). One participant indicated that ISO encouraged entrepreneurial spirit: *"yes, ISO instilled entrepreneurial spirit in some people, and it also encouraged it"* (Participant 20). The last effect of the standard was thought to be coming indirectly form recognition: *"ISO has affected indirectly. When this is mentioned in the report, it is considered a source of happiness. For example, we had the infographic initiative that everybody is aware of now. Seeing that in your report is really great"* (Participant 5).

The rest of participants [22/31] perceived no effect for ISO implementation on entrepreneurial spirit. The main argument was that entrepreneurial spirit had existed in the environment even before the standard was implemented as

Participant (14) said: *"ISO has nothing to do with that. This was practised before the system was implemented"*. Similarly, others indicated that entrepreneurship was not a requirement within the standard denying any possible impact as it was thought to be irrelevant: *"no at all; ISO is irrelevant"* (Participant 31). In the same context, one participant expressed his conviction that ISO was a documentation mechanism, so it had no relation to entrepreneurial spirit: *"ISO has to do with documentation only"* (Participant 12). One group pointed to workload as inhibiting any possible effect from ISO. According to Participant (25), *"no impact due to the large workload"*. The final reason for the absence of any impact from ISO implementation on entrepreneurship arose from the belief that entrepreneurial spirit was a personal trait. This in turn might have explained the absence of a framework to accommodate initiatives: *"I feel ISO implementation has no relation. It is about the people themselves. In fact, ISO does not focus on employees"* (Participant 2).

Looking at the data by DG showed some differences between DG1 and DG2, with more responses from the first suggesting positive impact for the standard on entrepreneurial spirit - 6 in comparison to 3. On the other hand, 10 responses from DG1 suggested ISO had no impact on entrepreneurial spirit, in comparison to 12 from DG2. When closely looking at these figures, many more from DG1 perceived no impact because their units had practised entrepreneurship before implementing the system, while more from DG2 thought of it as not being required by the system. This showed different mindsets in the two DGs. The informer reiterated his stance that at that stage, ISO was not requiring such outcomes: *"in relation to ISO, it is not a requirement yet. There is a difference between implementation in companies and governmental bodies, especially large ones. It is difficult to perceive the outcome in the public sector"*.

4.4.8 Mindfulness

Out of 30 responses, more than two thirds [21] confirmed that their units exhibited mindful behaviour providing evidence from their own experience to support the argument. The following quote presents one of many examples

provided by participants: *"we have it [vigilance] and I will give the proof. Sometimes some criticism is directed to the ministry on social media platforms. Immediately, the ministry or any other public entity reacts to that"* (Participant 17). Although responses did not provide a lot of details about the nature of mindfulness within the organisation, some notable aspects were observed. Mindfulness was multi-layered as the different levels of job ranks provided further lenses to examine the situation. According to Participant (31): *"our department is vigilant. And if something is unnoticed by an employee, the head of section will detect it. If not, the director will then observe it…"*. Participant (13) raised the other interesting fact saying: *"it all depends on the nature of work. Some units are mindful and others inactive…"*. Nature of work seemed to have played an important role. It decided whether an organisational unit needed to be mindful or not. But how? This was best explained by Participant (32) who attributed it to work sensitivity: *"…The sensitivity of the work we perform requires that [vigilance]. If we notice that birth rates jumped during a period, either getting the information directly from the Ministry of Health or from a newspaper, we react and set alternatives…"*.

In contrast, 8 participants indicated that their units lacked vigilance. The reasons behind the absence of vigilance could be categorised into 4 main lines of thoughts. Group one suggested that the nature of their work did not require any mindfulness. Participant (20) explained: *"honestly speaking, the nature of work does not necessitate that. It is a straightforward procedure…"*. The second line of thoughts pointed to the lack of integration among units within the organisation. This weakened the ability to observe any changes taking place.

"…there is a lack of integration between organisational units. Some teams and committees do not involve relevant specialities. Some of these directly touch our work, but our department is not represented in…We lack the integration that can enable us to be aware of whatever relates to our work" (Participant 27).

The third group referred to bureaucracy and absence of empowerment as inhibitors of mindfulness. The idea was that the front-liners, who were supposed to best understand the work, were not engaged in the detection system. According to Participant (14), *"because of limited authority, vigilance is*

difficult. If some people are granted authority, e.g. frontline employees, vigilance will be better. They do most of the job. They are in the field and understand the surrounding environment". The last line of thought related the lack of vigilance to the absence of a system to support a mindful organization: *"this relates to crisis management. There was little attention directed to this aspect as we dealt with problems after they happen. The new ISO 9001 [2015] system should enhance it through crisis management"* (Participant 28).

Breaking down the data by DGs showed some differences between DG1 and DG2. 12 respondents from DG1 believed their DG was mindful, in comparison to 9 from DG1. At the same time, only 2 participants from DG1 reported the absence of mindfulness in their unit, while 6 from DG2 reported the same. The informer attributed mindfulness to fact-based management, which he thought differentiated DG1 from DG2: *"we [DG1] are supported by facts. We see the scene 10 years ahead. This level of vigilance is because of facts that enable us to develop scenarios. The Directorate-General for Administrative Affairs [DG2] is not required to prospect"*.

4.4.8.1 ISO Impact

When asked to talk about how ISO implementation impacted mindfulness, around half of the participants [15/30] believed that the standard enhanced mindfulness. Participant (1) elaborated through a real example:

"…Although this was not within the scope of the ISO system, we visited the schools and checked the fire alarm devices. Some were not working…If there was a fire, the devices would have not worked. These devices might have failed before the implementation of the standard, but only discovered after implementation".

Respondents gave several explanations on how the standard had affected mindfulness. One of these was the organisation of work and roles. As participants explained, since work flow and roles were clear, people needed to be vigilant since its their responsibility to ensure the accomplishment of the task: *"it [ISO] has organized the procedure. For example, I am responsible for ensuring leaves over a particular period are entered into the system"* (Participant 22). A similar effect was enhanced visibility, which meant those accountable for the results or those behind any delay were identified. Also, the bottleneck,

the part of process causing the issue was detectable as KPIs measured any changes: *"before ISO, there was little attention paid to risks, since accountability and responsibility were not taken seriously. Activities were not assigned to actors rather to a unit. Now, any delay will affect the KPI, therefore, vigilance is required"* (Participant 7).

Some participants thought the feedback loop ISO set in place played a role in enhancing mindfulness. This feedback cycle served as a gatekeeper notifying employees if anything went wrong: *"yes, ISO enhances vigilance because it involves notifications and controls. You get a message from another unit and have to apply the measure…"* (Participant 15). Participant (2) praised the audit skills introduced by the ISO system for enhancing vigilance. According to her: *"vigilance is one of the internal auditing skills we were trained on. These skills ensure having high vigilance, so you observe things others do not notice"*. According to Participant (4), the latest version of the standard, 9001:2015, had improved vigilance through its risk-thinking approach: *"the new version stipulates that the organization needs to be aware of internal and external changes. Having the standard focusing on this aspect, encourages the organization, specially management, to consider it. This will enhance vigilance toward the external environment"*.

The rest of the participants [15] believed ISO implementation had not affected mindfulness attributing that to two main causes. People from the first group saw no connection between the standard and vigilance since it was not required by ISO or because ISO was perceived by them as a documentation procedure. According to Participant (19): *"ISO is about correction and development. This is irrelevant"*. The other group experienced no impact because this had been a regular practice within their units even before ISO was introduced: *"it's true that ISO requires vigilance, but we have had this characteristic before implementing the system [ISO]…"* (Participant 23).

Examining the data by DGs showed no notable difference in terms of the number of responses, however, two main observations were noticed. First, for DG1, the responses improved slightly when comparing the 2008 and 2015 versions of the standard. For the 2008 standard, 8 people perceived it to have

positively impacted mindfulness, in comparison to 9 for the 2015 standard. DG2 did not experience a similar change. Second, out of the 15 people suggesting ISO implementation had no impact on mindfulness, 8 said so because their units had practised mindfulness before the implementation of the standard with 7 coming from DG1. On the other hand, most participants from DG2 thought of the issue as irrelevant or not required. The informer ensured that vigilance was not an ISO requirement at that stage, which clarified its unimpactful role, according to him: *"in relation to ISO, I return to the same point. The system still does not require innovation, resource mobilization, etc. At the time, they are required to work on compliance, efficiency, and risk and knowledge management"*.

4.4.9 Coupling

When investigating whether the organizational units were tightly- or loosely-coupled, around half of the participants [17/32] indicated that their units were loosely-coupled. Participant (2) shared her thoughts: *"in case something goes wrong in another section, we are not affected…The concerned DG deals with the issue by its own. Employees from other DGs might not even know a problem have occurred"*. Besides the testimonies from participants, data collection coincided with a day when a whole section was away for a training session. This apparently did not interrupt workflow within the department or DG1. Another participant believed loose-coupling was inherent in the whole system, indicating that public entities enjoy resilience.

"look, work never stops; that's impossible. I don't think that work in any governmental entity can completely stop, either here in our organization or in another public unit no matter it is about employees, the system or network. At the end they will carry it out" (Participant 17).

The responses revealed that self-organisation played a major role in ensuring loose interconnectedness between sections. Self-organisation techniques enabled a section or department to balance itself and continue operating. According to Participant (10): *"there is flexibility and teamwork to confront any challenge. For example, one section offered us help last year. We sent some of our files to them, during the peak time. They complemented our work…"*. Although participants confidently talked about their loose systems, it seemed this

system in most cases was not planned, rather it was because of a number of interacting circumstances. Participant (28) confirmed that and showed how this forced their department to move from a tightly-coupled to a loosely-coupled structure: *"at the department level, we tried to base our sections on teamwork rather on traditional divisions. This was chosen due to work interruption experienced when one employee was absent…Works were distributed…in the past work was severely affected…"*.

On the other side, 9 people said their work environment was tightly-coupled. Participant (9) provided an example: *"another section depends on our data - indicators. If we don't provide the data, they cannot work, although it all depends on simple data like last year's statistics"*. Another coincidence during data collection was a problem with the electronic system which terminated work in some parts of DG2. Participant (22) cited that: *"in case the portal [electronic platform] goes down, the whole ministry cannot work. We have not been working for the last two days because of that"*. Participant (4) discussed the causes behind tight-coupling, either internally or externally: *"in fact, there are many challenges in this regard. These relate to the breadth of the organizational structure, besides being tightly-coupled with other governmental entities like the Ministry of Civil Service and the Ministry of Finance…"*.

The last group of people [10] pointed that coupling was inconsistent throughout the organization, with some units being tightly- and others loosely-coupled: *"…If work in the leaves' section stops, we also stop. For other sections that's not a problem. The promotion section, for example, are affected when no budget is allocated. The leaves' section affects the whole ministry"* (Participant 18).

Examining the results by DG showed no real difference. However, planned looseness in the structure was only noticed in DG1. Also, as the cases observed during data collection showed, the units from DG1 were less affected by disruptions, unlike units from DG2 which were severely affected. Contrary to the results, the informer believed DG1 was more tightly-coupled than DG2: *"interconnectedness might be less tight in the Directorate-General for Administrative Affairs [DG2]. Here [DG1] it cannot be due to the nature of work"*. However, further examination of his remarks showed he was referring to

coupling at the macro level, while respondents referred to it at the micro level, except for one participant who mentioned it at DG-level.

4.4.9.1 ISO Impact

The investigation into the effects of ISO implementation on coupling provided different perspectives. 11 out of 29 responses perceived the standard to have positive effects by enhancing independence between units. According to Participant (1), the main impact was introducing a shift in mentality: *"…After implementing the standard, minds have become open to finding a solution for any problem. This is because the employee now predicts, which makes him/her ready"*. Another perspective pointed to organizational learning resulting from implementing the standard as an indirect enhancer of looseness in the organizational structure: *"ISO has affected in one way… all units within the scope of ISO are informed of any issue faced by another unit. Why? Because these are presented and discussed transparently"* (Participant 2). Others thought ISO implementation improved flexibility, which reduced interconnectedness: *"after the implementation of ISO, we have become more flexible"* (Participant 7). One of the very important impacts identified by participants was visibility. This group of participants praised ISO for doing two important things, in their opinion: locating the failure and dissolving overlap between units: *"ISO revealed the overlapping between units and dissolved it"* (Participant 20).

On the other side of the argument, 8 participants looked at the standard as negatively obstructing loose-coupling. Three key thoughts were observed within responses. The first group identified ISO as causing tight-coupling: *"ISO causes interconnectedness because work procedures are set in the standard. Any problem at any point stops the whole flow"* (Participant 21). Another group believed ISO did not introduce tight-coupling, but it played a role in fixing it within the environment. According to Participant (30*): "ISO fixed the interconnectedness to a great extent. Now, we have to sign subcontracts with the Directorate-Generals not implementing the standard"*. However, one last observation pointed to the difference between the 2008 and 2015 versions of the standard. Participant (5) indicated that the latest version improved this

aspect: *"in the previous version [2008], ISO used to hinder flexibility. In case one department stops, all the others might stop too. The new version, however, has introduced a new perspective, which is much better"*. Referring to risk management, the participant believed it managed to overcome the negative consequences the previous version had introduced.

The last group of participants [10], saw no impact for ISO implementation on coupling. This was attributed to two main factors: the fact that it was not an ISO requirement and the organizational structure: *"…ISO does not focus on the speed of decision making. It asks for top management's commitment to quality and sound planning. It supported these aspects. These are what we focus on when evaluating the units"* (Participant 3); *"I don't think ISO is relevant. This is determined by the organizational structure which came before ISO was implemented"* (Participant 8).

Breaking down the data by DG introduced a different perspective. Participants perceiving ISO to have positively impacted coupling from DG1 were more than the double of those from DG2, 7 to 3. The result improved for DG1 when adjusting the figure for the latest version (9001:2015), 8 to 3. Similarly, less people from DG1 indicated negative effects by the standard on coupling, 3 to 5, with the number improving when considering the 2015 version, 2 to 5. For those indicating no impact, it is noted that more people from DG1 perceived no impact because some explained that their units exhibited loose-coupling even before the implementation of the standard. The informer agreed that ISO could not disentangle tight-coupling due to the nature of work, but he praised the system for locating the sources of problems: *"the absence of ISO's effect is because of the nature of work, which does not allow for disconnectedness. Importantly, ISO has revealed overlapping and duplication of work. We complement one another"*.

4.4.10 Resourcefulness

After looking at the different elements of resourcefulness separately, participants were invited to express their opinion on the overall resourcefulness of the system. From 30 responses, 23 assumed their systems

were resilient and capable of dealing with difficulties, including unexpected events. This major segment of participants provided four views on this capability. The first group related resilience to self-organisation. They believed that this practised attribute, which many said was there for years, enabled overcoming adverse conditions:

"we have been through such challenges. We had the systems shut down for more than a week, around 10 days, because of a virus. We were isolated from the world. However, we had social media like WhatsApp, Twitter and Instagram. We used these to accomplish our mission. We have these supporting systems" (Participant 11).

A second group referred to planned measures set for such situations. These pre-set actions aimed at eliminating or at least reducing the impact of any risks. According to Participant (30): *"…we have pre-set measures to deal with weather conditions… similarly, if any cyber threats rise, we proactively update the system and block some websites. During the ransomware event, we were among the best to deal with the situation"*. Some participants pointed to the important role collaboration played when it came to dealing with difficulties. When the issue was beyond the internal capabilities of a section or department, synergy and integration become key. As Participant (8) very briefly explained: *"when unexpected events hit and we cannot deal with them, we contact the concerned personnel"*. Participant (12) showed how things worked within the environment when adverse events stroke: *"here, everyone does his work. We can solve problems with synergy. We might predict a problem, but the solution might lie somewhere else in the ministry, or it might necessitate a collaborative reaction from several departments…"*. The last group described how risk-thinking introduced by ISO 9001:2015 had affected their units' resilience capability. The responses indicated that risk-thinking contributed to resilience: *"we dealt with the ransomware virus, which was unexpected. With ISO, we consider crisis situations and crisis management. We started the risk-based thinking approach. You can find an alternative way to complete work"* (Participant 1). The previous remarks applied to both self-organization and planned measures.

On the other side, 7 out of 30 respondents perceived their units not to be resilient when dealing with difficulties. The basic assumption here was that

these units were not well prepared to deal with such issues. According to Participant (14), *"I don't think these issues are dealt with. These are temporary situations but cause problems. I don't think there is a plan in place"*. Examining the respondents by DGs showed that DG1 was more resilient than DG2, with 13 from DG1 indicating so in comparison to 10 from DG2. In this context, risk-thinking was more mentioned by participants from DG1. Also, both DGs, almost equally, utilized self-organisation as a main approach to overcome difficulties. In relation to overall resourcefulness, the informer seemed to be somewhat dissatisfied with the situation, explaining that they had to sacrifice some performance criteria to overcome difficulties:

"we are capable of adapting, but not fully overcome the difficulty. For example, if we cannot mobilize a required sum of, let's say, 1,000,000, we adapt via less effective means. We kind of overcome the difficulty, but do not realise the same level of outcome. The educational process goes on, but not as planned".

4.4.10.1 ISO Impact

The discussion over how ISO implementation had affected resourcefulness provided various insights. The majority [20/32] said they observed positive impacts. One of the instrumental aspects was top management's commitment, which is an ISO requirement.

"the ability to deal with difficulties improved with ISO. Why? Because ISO involved leadership…the interesting thing that ISO-related teams are powerful. For example, I attended one of these chaired by an undersecretary of the ministry and Director-Generals. Decisions are made during the meeting after presenting the problem, root causes and proposed solutions…" (Participant 7).

Responses also referred to employee engagement introduced by ISO as contributing to the ability to deal with difficulties. This provided a wider pool of thinking for the organization. According to Participant (29):

"because of the ISO system, everyone participates in resolving crises, not only those in charge… everyone thinks, while in the past the director was the only thinker…Sometimes, the employee would have been an obstacle, since the solution might have added a burden to him. Now, a solution is a rescue from delay since it is evident where the problem is located".

Similarly, responses pointed to enhanced role assignment after the implementation of the standard, as Participant (14) clarified: *"ISO improved it [resourcefulness] since now the right person is assigned the right position"*.

This showed a shift from the old experience-based promotion system to a more competence-based system. Another important effect of ISO implementation raised by respondents was improved organization and visibility. With visibility, access to data and better understanding was achieved. This in turn seemed to enhance risk management capabilities: *"by organizing work, the organisation now better knows its capabilities, the surrounding environment and the organizations it can work with… ISO has improved our capability to deal with crises"* (Participant 26). Participants mentioned an indirect consequence resulting from the previous effect, accountability. With visibility, location of failure became easy, which enabled assigning accountability. No more was the director alone accountable for everything. Participant (16) said: *"now with everyone being accountable, they consider all possibilities – the events that might affect work and how to overcome them"*.

Another aspect referred to by participants was the ISO follow-up system which helped employees to set milestones and navigate toward goals: *"ISO has had a big impact. As I said at the beginning, ISO is a monitoring mechanism. In case of a delay or a risk, it notifies you and helps you resolve the situation"* (Participant 23). According to participants, the most important effect the standard had on resourcefulness was the introduction of risk-thinking. The next quote reflects this perspective: *"ISO contributes via risk management, creating alternatives. Therefore, you will be always ready for any problem"* (Participant 15). Finally, a respondent believed that the documentation required by ISO facilitated better risk management, resulting in enhanced resourcefulness. According to Participant (9): *"we have always faced difficulties, but there was no documentation and knowledge reporting. Now, knowledge, experiences and specific risk management measures are recorded…"*. Participant (28) talked about the difference between the 2008 and 2015 versions of the standard. He revealed that unlike the previous version, the new one has put focus on multiple variables and crisis management: *"the 2008 standard did not focus on such issues, but the 2015 does…"*.

In contrast, 12 participants stated that ISO implementation had not impacted resourcefulness. The first perspective perceived ISO to be irrelevant,

considering it a conformance and documentation tool: *"no effect. ISO is about compliance to procedures. It has nothing to do with crisis management…"* (Participant 21). Participant (19) added an interesting view, saying: *"because the Department of Quality is not directly connected to the office of the minister, it tells you about its importance"*. It seemed there was a feeling that ISO was just a formality due to the weight it was given in the organizational structure. Thus, its effects were limited, according to this view. Some participants emphasized that they had practised resourcefulness prior to applying the standard: *"I see no effect. We have had open mentalities and researchers with degrees. The organization was capable of dealing with difficulties even before implementing the standard… ISO organized work and reduced the time needed to finish work"* (Participant 24).

The breakdown of data showed that for DG1 ISO implementation made it more resourceful in comparison to DG2. 12 out of 15 from DG1 believed their units became more resourceful, while only half the participants from DG2 believed so [8/16]. Added to that, the figures for DG1 improved when considering the difference between the 2008 and 2015 versions of the standard, with the latter showing slightly better results [12 for ISO 2008 and 13 for ISO 2015]. In agreement with the result, the informer found ISO to contribute to better resourcefulness:

"the great thing about ISO is that challenges are dealt with during the quality council meeting. ISO systems reveal the challenges, provide recommendations and the council makes decisions. Some results showed that the organizational structure needed to be modified to eliminate duplication of work, and this was done. Leadership plays a role through the planning, monitoring and elimination of challenges. That is a catalyst. Add to that, leadership clears any challenges related to external aspects. Employees and middle management assess risks, while top management disentangles them".

4.5 Evidence for other research questions

4.5.1 Self-organization

The responses on self-organisation unanimously proved that this aspect had been key in ensuring continuity of operation. It was the main mechanism through which work was completed during difficulties: *"we have highly effective flexibility. In case the online systems stop working, we move to paper work"*

(Participant 10). Self-organisation was also instrumental in overcoming tight-coupling among some units. When a unit was facing difficulty, support was provided from other units: "*For example, if we come across any problem when it comes to furniture distribution, we have enough employees deployed according to our needs. People from other sub-units cooperate"* (Participant 6). Perhaps Participant (11) produced the best description of the vitality of self-organization for resilience:

"…we never stopped because of any obstacle. We always strived for adaptability and looked for new activities. In our annual strategy, we had identified a set of initiatives, but the financial crisis was an obstruction. However, we worked on other activities. We mobilize resources by advertising the products of partners among employees, while we get something in return".

4.5.2 Entrepreneurial spirit

Respondents talked about the role entrepreneurial spirit played in the organization's ability to overcome challenges. Although entrepreneurial spirit did not match the large impact of self-organization, it was an important asset to overcome challenges (e.g. resistance and lack of financial resources). According to Participant (23): *"the initiatives from employees and management are great. We always feel this is our second home. There are initiatives to overcome financial or technical problems. It can be initiated by the person facing the issue or others"*. One of the challenges faced by the organization was resistance to the implementation of ISO. Again, entrepreneurial spirit proved to be key: *"…when ISO was first implemented, there was resistance... A girl with good knowledge in quality offered holding workshops and explaining the new concepts to those resisting, since the system was ambiguous and unclear"* (Participant 7). Entrepreneurial spirit contributed to mobilising financial resources at a time of scarce resource availability. According to Participant (31): *"many of our books are left in the store. Our director, who is an active person, contracted a company to recycle these books and we get money in return…"*.

4.5.3 Mindfulness

Inputs from interviews provided some insight on the important role mindfulness plays in resilience. First, it enhances detection of any sign of a problem: *"our department is vigilant. And if something is unnoticed by an employee,*

the head of section will detect it. If not, the director will then observe it…" (Participant 31). Second, it added a long-term perspective which meant the organization was ready for challenges when they come. Participant (32) said: *"…The sensitivity of the work we perform requires that. If we notice that birth rates jumped during a period, either getting the information directly from the Ministry of Health or from a newspaper, we react and set alternatives…"*. Finally, with enhanced mindfulness, respondents believed people started to see things they did not see before: *"vigilance is one of the internal auditing skills we were trained on. These skills ensure having high vigilance, so you observe things others do not notice"* (Participant 2).

4.6 Role of organizational structure

4.6.1 Communication

Out of 31 responses, the majority [24] confirmed that communication within their units was horizontal. The respondents listed several features exhibited by the communication flow. They showed that communication was smooth with no barriers obstructing it in all directions: *"…here, communication is smooth at all levels. You can easily reach the Director-General…Communication is smooth and excessive in all directions"* (Participant 8). Participant (2) commented that a main feature was the absence of a gap between the different levels of job ranks: *"…we have a continuous chain of communication. Therefore, there is no gaps with top management. This has enabled improvement as we always need to reach top management for decision-making…"*. A notable repeated remark was flexibility in communication methods. According to Participant (15*): "communication is smooth either by phone or direct contact. When contacting top management, we go to have a face to face interaction taking the relevant paper…"*. Others pointed to the use of the online platform and emails also.

Participant (21) explained that communication increased work effectiveness and improved employee satisfaction: *"I love communication here at all levels. Communication with top management increases work effectiveness, especially between management and employees…communication in the work environment is smooth"*. Similarly, some responses demonstrated that communication added

value to work: *"…we need to reach top management for decision-making, while top management needs feedback from employees. In other words, to be able to improve, issues need to be raised and communicated. Honestly, communication has become value adding and clearly aimed"* (Participant 2). Some participants specified that because their units were teamwork-based, communication flourished. Participant (25) said: *"in our work, this needs to be continuously organized because it is a work requirement. No one can work alone, we must work together. We start and finish together…"*. One final observation was introduced by Participant (5), who showed that communication flows both through formal and informal networks: *"communication between employees continues through both official and personal channels"*. The use of informal networks reflects the importance of social relationships in task accomplishment. It also indicates that social considerations may drive the effort, not organizational motivations.

In contrast, 7 participants believed that communication was vertical within their units. They attributed it to the organizational structure as explained by Participant (16):

"communication is in accordance with hierarchal sequence. All [communication] is done electronically, except meetings. I must follow the rules when contacting the head of section. Any issue is raised to him, who raises it to the director, who in turn raises it to the Director-General…".

Participant (11) highlighted the presence of a gap between first line employees and top management: *"actually, communication is smooth between employees from the same rank, but becomes difficult with higher ranks…the only issue is the gap between ordinary employees and top management in the ministry"*. Participant (4) confirmed the presence of vertical communication noting that attempts were made to move toward a horizontal system:

"in fact, the organizational structure and the dominant culture here are vertically oriented. This can be noticed through the different aspects like communication and decision-making…there are serious attempts to change the culture, but challenges do exist at all levels. Some try to facilitate change while others resist it".

Examining the data by DG showed that DG 1 looked far more horizontal, in terms of communication, than DG2 with 14 from DG1 indicating so (almost a consensus) in comparison to 10 from DG2. The informer commented on the

difference between DG1 and DG2 in terms of the flow of communication saying:

"I think the difference between the two Directorate-Generals is attributable to workload in the Directorate-General of Administrative Affairs [DG2], their branched specializations and their large hierarchy. They serve more than 80,000 employees. We, on the other hand, have clarity which makes communication easier. Besides, we have good human relations. I have no idea about the relationships in their environment though".

4.6.1.1 ISO Impact

Most participants [20/32] perceived ISO implementation to have positively impacted communication within their work environments. These effects came in various forms. First, the standard ensured leadership's commitment, which added more power to communication leading to improved performance: *"ISO set a key and very very important requirement, having communication between top management and ordinary employees. We have regular meetings now. Some are chaired by the minister or the undersecretary…"* (Participant 2). This somewhat narrowed the gap between the top and bottom of the organization. Participant (10) demonstrated that by engaging people, ISO enhanced communication: *"because the system [ISO] requires engaging employees in planning and development, it enhanced communication"*. It seemed that with more roles and authority, further communication emerged. Participant (13) commented: *"I think ISO established more work-related communication. We have quality-related communication now"*. According to Participant (16), the standard improved communication speed since it involved timeframes and follow-up: *"it [ISO] has greatly impacted in terms of time, speed and cutting delay. Employees reply faster and do not neglect anything. That is because others follow with set schedule to complete the task"*. Another group thought ISO improved organization and visibility, making sure communication paths are well defined and clear.

"definitely it [ISO] plays a big role. Now, top management understands the different steps of the process, instead of just receiving results as it used to be. Hence, they better recognise obstacles and risks. This creates communication between employees, from the very bottom to the top. There are continuous ISO-related meetings, which result in other follow-up meetings" (Participant 5).

Some participants indicated that the standard added value to communication. In other words, communication became more improvement-oriented because

of the fact-based approach. According to Participant (19): *"…now, those in charge have statistics and indicators; they have become more informed…this was introduced by the system [ISO]. I feel it improved communication"*. An interesting point was raised by Participant (4) who expressed that ISO implementation contributed to moving from the vertical to the semi-horizontal organizational structure, which improved communication: *"ISO implementation has had a positive effect by introducing the semi-horizontal system. This is because we use teamwork now…this adds a kind of horizontality…"*. Finally, Participant (30) believed that ISO implementation promoted better integration between organizational units: *"there is a positive impact. ISO creates communication and speeds up work. It also creates an integrated work environment, which is a requirement for certification"*.

On the other hand, the remaining participants [12] considered ISO implementation to have had no impact on communication. Two main lines of thoughts were observed here. The first group looked at the standard as irrelevant believing it only focused on work procedures and compliance: *"ISO has set roles and identified procedures to avoid overlapping between employees and units…communication is not relevant. Employees look at ISO as a work task"* (Participant 20). The other group perceived no impact because their units had had the same flow of communication even before implementing ISO. According to Participant (8), *"…the Directorate-General [DG1] has always had this level of communication due to the nature of work. Our work has always been cooperative. You cannot work individually here…"*.

Looking at data by DG showed that equal responses form the two DGs perceived positive effects for ISO implementation. The same applied for responses indicating no impact. However, among the 12 people believing the standard had no impact on communication, those indicating their units had always had the same communication flow came from DG1, while those considering the standard to be irrelevant or a task came from DG2. This demonstrated a difference in conception regarding the standard. The informer confirmed the key role ISO played, showing it was one of the main goals for the implementation: *"communication is one of our goals in the quality system. The*

high level of communication has been existing for a long time, but now it is based on the principles of quality. It has become a task and work requirement".

4.6.2 Employee engagement

28 respondents indicated that their units engaged employees in the different aspects of work. The most prominent area employees were engaged in was planning. According to Participant (32), *"employees do participate in planning, both in the 5-year plan and annual plans. Some plans are section-level while others might be departmental or organizational…"*. It goes without saying that employees were engaged in execution as well, Participant (28) noted: *"there is engagement in goal setting and work execution, identifying who does the work and performing it"*. Interestingly, some responses pointed to the fact that employees could shape the decision: *"…for example, it was decided that a procedure should have been completed within 3 days. The employee provided justifications to prove that was not enough. It was changed to 7 days. It means employees affected decision-making in some cases"* (Participant 7). Participants also mentioned they were engaged in the provision of consultation and feedback. According to Participant (10), *"we are effectively engaged. Both the current and former head of section consult us and seek feedback for improvement"*. This is particularly crucial in the context of risk management. In relation to problem solving, employees played a similar role by providing facts and evidence-based solutions: *"for challenges and issues, when a decision needs to be taken, it is studied, and solutions are proposed. And the solution does not come from one person; the whole department contributes, 18 people"* (Participant 2).

Some participants indicated that although engagement was actively observed, it was determined by three main factors. First, the nature of work determined whether engagement could take place, Participant (21) said: *"…engagement is evident, but it depends on the nature of work...we definitely engage employees; we even hold brainstorming sessions together"*. Similarly, employee's competency was perceived the second factor, where some were thought to be able to handle it while others only performed routine work: *"it depends on employees' proficiency. Participation is granted by law to everyone…however, it depends on one's competence. Some perform routine work…"* (Participant 20). The last factor

was the role of management or leadership. The person in charge decided whether the unit engaged employees or not. Participant (3) commented: *"…for 10 years, I have witnessed many directors and head of sections. It has been inconsistent, which has been also revealed by ISO. The person in charge could exhibit leadership and engage people and even empower them"*. It is worth noting that engagement worked as a closed-loop dynamic, where certain issues were deferred to employees from top management to examine and provide potential solutions. These solutions were then raised to top management. At the same time, feedback and proposals were raised by employees to top management to approve and then send back for adoption.

In contrast, only 4 people believed engagement was not present in their units. The people in this group referred it to hierarchy and management style. According to Participant (30), *"…we lack engagement in our organizational structure…I have noticed that individual decisions are normally modified or cancelled, while those coming from a broader background positively contribute to the organization"*. As mentioned in the previous section, management style determined whether people could get engaged. Participant (11) added that: *"management may accept that in some cases and refuse in others. They normally accept common ones [contributions] and reject the new. The person in charge may even adopt an employee's idea and present it as his own"*.

Examining results by DG showed little difference as 15 from DG1 said their units engaged employees in comparison to 13 from DG2. Again, the informer explained that employee engagement was one of the goals for the ISO implementation: *"engagement is a goal we have been pursuing over recent years. We managed to realize it and now we look forward to implementing deeper practices"*.

4.6.2.1 ISO Impact

Out of 30 responses, more than half [17] believed ISO implementation had had positive effects on engagement. The first impact was contextualising engagement within the formal structure as a requirement. This was achieved through two ways: obliging engagement and providing formal mechanisms to

ensure implementation. About the first said Participant (1): *"it affected by ensuring decision-making is carried out by employees. Before this was not contextualised"*. Also, formal mechanisms (e.g. forms) were introduced to ensure application: *"ISO has developed and adopted work forms, which align with engagement requirements"* (Participant 12). The standard also had impact by encouraging wider participation. Participant (28) spoke about that: *"before, only the head of the concerned section was engaged. Now, it is essential to have employees participating. This applies to the preparation of documents, where the whole section meets, and everyone contributes"*. Responses showed that this applied also to problem solving, and provision of feedback and innovation. Participant (2), for example, said: *"I feel that under ISO problems are continuously examined, treated and improved. Now in our meetings we always make decisions, which are based on employees, executives and directors' inputs"*. Besides, respondents talked about the role of recognition by the ISO report. This was perceived as an incentive for more engagement from the employee side: *"the ISO system records employees initiatives introduced by each section. The final report includes the pros, cons, processes and issues. Employees' initiatives are mentioned, which is an incentive for the employee"* (Participant 5). Another important impact was visibility, which in turn produced organization, timeliness, assignment of roles and accountability.

"I think there is an impact; I myself have observed it. The employee is now in charge of the process or procedure, and his performance is visible to top management. When any issue arises, this can trigger direct contact with the employee. Visibility resulting from ISO contributes to more participation" (Participant 4).

On the other hand, 13 people thought the standard had had no impact on engagement within the work environment. This was attributed to two causes. The first group mentioned that their units had always been engaging employees even before implementing ISO. Participant (10) briefly said: *"this pattern has been around even before we implemented the ISO system"*. Others hinted that the standard did not affect engagement because it was not implemented fully. Some even pointed to a difference between reality and policy ('decoupling'):

"from my point of view, ISO is just a tool for solid planning. But does it play a role? Let me give you an example. If a doctor asks me whether I smoke or not, and I lie and say no, I lie to myself. ISO is nice and great, but those in the top have created obstacles" (Participant 11).

In general, the impact of ISO seemed to be partial. Investigating results by DG showed some difference. 10 from DG1 believed ISO implementation introduced positive effects, in comparison to 7 from DG2. Similarly, 5 from DG1 thought ISO did not have any impact, in comparison to 8 from DG2. It was noticed that most of the responses from DG2 pointed to inadequate implementation of the standard, whereas the majority of responses from DG1 explained that engagement was part of their culture before implementing the standard. Regarding ISO's impact, the informer revealed that the system was one of the causes leading to more engagement: *"ISO is one of the causes of this conviction as it emphasizes that employees should handle everything"*.

4.6.3 Employee empowerment

Out of 32 respondents, only 9 believed employees within their units were empowered to make decisions. This minority group attributed it mainly to visibility, which according to them made the decision-making process clear and straightforward: *"…that's because we define clear rules and boundaries. We had such determinants, but not for all procedures and processes. This gives the employee confidence to make a decision…"* (Participant 32). Participant (10) demonstrated how this was reflected in her work environment: *"because in our work both procedures and regulations are clear, that's [empowerment] possible"*. Some participants pointed to the nature of decision as a key factor. Authority could be delegated when the decision was at the section or departmental level, while at DG level in most cases delegation was not possible. According to Participant (27): *"...for department-level decisions, I give the employee freedom to decide. However, official organization-level decisions are out of my own authority. At department level we exchange opinions and consult"*. Participant (4) explained:

"in fact, empowerment is practised at both the section and department levels. We noticed that during internal auditing, for instance. But it has not moved to the Directorate-General - top management - level yet. It might be that obligation to regulations outweighs empowerment. We have laws and regulations like the civil

service law…etc. So, top management might be balancing empowerment with other obligations".

From the alternative viewpoint, the remaining 23 participants articulated the absence of empowerment within their units. Most of this group noted that their role ended after drafting the decision: *"the employee does not participate in decision-making. Employees contribute by preparing draft decisions"* (Participant 1). Participant (30) added that employees' role was to perform procedures: *"executive employees perform routine work…"*. When investigating the reasons behind the absence of empowerment, several causes were proposed. First, accountability and fear of consequences were the most prominent deterrents. Both directors and employees seemed to avoid accountability. According to Participant (18): *"…the person who makes the decision has to bear responsibility. There is no independence, and engagement is really weak…"*. Another perspective related it to the nature of work: *"it depends on the nature of decision. Some decisions cannot be made by employees and others must be made by top management. The employee analyses the issue. At section level, there is more room and understanding for that"* (Participant 5). One group indicated the presence of barriers that obstructed empowerment, which seemed to originate from the organizational structure itself:

"we still need to make more steps toward empowerment. Do you think I can prepare a plan and send it to senior directors? In fact, there will be so many obstacles and obstacles, especially in terms of financial ones, particularly, if the plan changes current concepts. The attempt might get frozen" (Participant 11).

An interesting point was raised by Participant (16) who further disentangled visibility into a horizontal and vertical perspective. He thought although good visibility was occurring horizontally and even vertically, vertical visibility was one-sided, top-down. In other words, top management was aware of what was going at the bottom, while employees were not quite sure about what was going at the top: *"…we write our opinions but never know if the decision was based on ours…there is no discussion. We just synthesise and then send them. We don't know how the decision is made. This relates to senior leadership"*. A totally different stance was that of Participant (17) who resisted empowering employees. The argument was that this could lead to chaos: *"anyway, that [empowerment] is not healthy. This can lead to blunder. A preliminary concept should be set and then a*

committee established to study the proposals. This is the best option, and it is practised now".

No difference was observed between the two DGs, except it seemed people in DG1 were more aware of the importance of empowerment and looked forward toward achieving it, while people in DG2, despite being aware of the absence of empowerment, did not look at it as an important factor for improvement. Although the informer agreed on the absence of empowerment in decision-making, he perceived employees' engagement in strategic planning as empowerment:

"decision-making is still out of our reach. We hope it will improve. But let me give you an example. When it comes to school buildings, the employee is somewhat empowered. He prepares a 5-year plan worth of half a billion Rials. Our colleagues from regional Directorate-Generals also participate".

4.6.3.1 ISO Impact

When looking at the impact of the standard on empowerment, 12 out of 31 responses perceived positive impacts. One important impact was introducing a mentality shift, as Participant (8) explained: *"I believe ISO plays a role since top management has been involved in it. ISO is actually a shift. Top management's mindset has been changed"*. The second and most repeated impact was improved visibility. According to Participant (32): *"ISO requires criteria and regulations, which made us set rules. ISO also requires indicators, procedures and schedules… these were there, but ISO contextualised and documented them in the system. This facilitated follow-up"*. Stemming from the previous cause, the third impact came from ownership of process or work procedures. This enabled distributing responsibility and accountability to process owners: *"ISO is an organizing and developing tool. Because everyone is responsible and accountable, even senior ones, they all perform work to the fullest"* (Participant 16). In the same regard, an important comment was introduced by Participant (20) who said: *"ISO clarified roles and authorities. It gave back some ripped off authority to employees…"*. Some participants believed that because ISO required more engagement, empowerment had been adopted in a wider scope. Participant (28) held: *"after implementing the standard, empowerment has increased because of wider participation. The other has a space to discuss and perform the work*

according to his planning". The last impact came through capacity building, which according to Participant (4) would lead to empowerment: *"to adequately implement the system, capacities need to be built. The standard includes several items related to human resources, when applied empowerment will be achieved"*.

On the other hand, 19 participants said that they observed no impact of the standard on empowerment. Although not much explanation was provided, organizational hierarchy was perceived to be the main reason: *"in the organizational structure, decision-making is beyond employees' scope. ISO engages employees but does not empower them"* (Participant 1). Similarly, the work environment seemed to be heavily blame-based, as people focused on responsibility avoidance. According to Participant (21): *"employees avoid decision-making. Forms are signed either by the Director or Director-General"*. A third perspective attributed it to individual differences: *"it relates to the differences between people…ISO ensured consistency and clarified roles. It organized work. Further development depends on personal attitudes"* (Participant 19). It meant that both differences in management's perspectives and employees' personalities played a role in whether authority was delegated or not. Many participants thought ISO did not impact because it was irrelevant: *"it's irrelevant. ISO is about organizing work and files. The nice thing about ISO is follow-up and correction in case something was not considered before"* (Participant 17).

The results showed that employee empowerment was missing in the organization as a whole. A detailed examination of results by DG showed that more respondents from DG2 than DG1 found ISO to have impacted empowerment positively, 7 to 5. Similarly, more people from DG1 thought the standard had no impact on empowerment than from DG2. It was noted that more responses from DG2 felt ISO as irrelevant. They considered ISO to be either a formality or a personal issue – implementation depends on people's personal attitude. While more people from DG1 considered ISO's lack of impact came from the system and culture. Unlike employees' responses, the informer suggested that ISO implementation did empower people: *"ISO implementation generates empowerment naturally. The moment the system is*

implemented, it empowers employees". However, since the informer perceived engagement as a kind of empowerment (see his comment in the previous section), the input remained vague.

4.6.4 Nature of work (Process-/Routine-orientation)

When asked about the type of work performed by their respective units, 20 out of 31 respondents indicated their units performed process-oriented work. Participant (1) talked about that: *"…we perform processes which have inputs, outputs and activities. You need to perform some steps to get to the outputs. We also deploy indicators to measure inputs and outputs…"*. The responses demonstrated attributes resulting from following a process-oriented work performance. The first noted feature was visibility, which controls the rhythm of work within the organization: *"…the good thing is having clarity in terms of time schedule, besides a written task to be performed to complete work. Everyone knows about the dates and timings and knows the consequences of delay. Therefore, we are committed"* (Participant 24). Visibility seemed also crucial for better control over work flow. Responses also indicated that process-orientation involved engagement and teamwork, Participant (27) noted: *"…our departmental plans relate to the Directorate-General's plan. We have set activities that people perform. Of course, employees themselves develop the plans; it is a partnership. Work is distributed within the section"*. An important aspect was presented by Participant (2) who talked about improvement and change. According to her: *"…for our processes, I need to document change, what I have updated during 2017 and what will be updated for 2018, and so on"*. This referred also to another feature, the documentation of work. The participant elaborated saying: *"because of documentation, you do not have to start from zero every time an employee is replaced. This causes chaos and errors"*. Participants also noted that their work did involve some routine-based activities, which depended on the goal: *"it depends on the goal and procedure. Some can be done individually, and others need teamwork; some require technology and others does not"* (Participant 29).

Alternatively, 11 participants described their work to be routine-based. Participant (30) summarised the scene: *"they [employees] perform the routines they are asked to do. Some employees might present ideas for improvement, but the*

majority do the prescribed work only…". Here, the environment exhibited several characteristics, including specialization. According to Participant (14): *"work is determined based on specialization or job title"*. Another perspective showed that improvement was nothing more than updating the current routines: *"work is routine-based or bureaucratic with some changes…all main procedures are still routine-based. Employees have no authority to evaluate work and take responsibility"* (Participant 18). At the same time, responses pointed to the absence of innovation, as Participant (11) noted: *"…processes here, especially under the current financial situation, are very routine-based. This was the case in the past and it is now. Innovation is missing…you just perform the task; innovation is far away…"*. However, responses ensured that change had taken place after the introduction of ISO, which required a transition toward process-orientation that was taking place: *"…in the past, we based our work on routines, but with risk management, we are heading toward process-orientation"* (Participant 22). Participant (7) supported this argument explaining that this transition had introduced more control over work: *"work has become more visible. Thus, delays are penalised. Employees better understand the work and roles within their sections"*.

Breaking down data by DG showed a big difference between DG1 and DG2. For DG1, employees unanimously demonstrated process-orientation within their units, while only 4 (around a 1/4) from DG2 indicated so. In relation to the difference between DG1 and DG2, the informer associated that to the nature of work: *"the difference can be due to the nature of tasks and work; for example, appointment and transfer [from DG2] are routines"*.

4.6.4.1 ISO Impact

Out of 32 responses, 21 suggested ISO implementation had positively impacted the nature of work in their units. The first group said that the current level of process orientation, or reduced level of routine-orientation, was because of the standard. According to Participant (2): *"I can say that before ISO it was chaotic. The employee did not understand the process, inputs, activities or outputs. He only had to do steps 1, 2 and 3; nothing more. The difference is huge"*. Similarly, participants attributed organization in the work environment to the

standard: *"…work was routine-based. When someone was replaced, the new employee started from zero. 4 employees might have worked in the same office with four different ways. Each had her/his own way. Now, it is all unified in 11 Directorate-Generals"* (Participant 28). Improved visibility was also suggested as an impact for the standard, according to Participant (30): *"it [ISO] created more visibility and transparency. It also requires measuring beneficiary satisfaction, which improved service"*.

Participant (4) pointed to continuous improvement as an impact, which is a key concept in any quality programme: *"…because employees did not know work steps, there was no improvement. Now, steps are visible and chances for improvement have become very high"*. One impact was ensuring consistency in terms of role and responsibility assignment: *"roles and responsibilities were identified in some units before ISO implementation. This was shown during the diagnosis stage. Now, this has been generalised across the organization"* (Participant 3). Finally, even those who ensured their units were routine-based witnessed some improvement as routines were updated and organized. According to Participant (20): *"in the past, routines were passed from one employee to another, inherited. ISO has shown how - the approach, the path, and why. It has also clarified specializations. ISO cleared things up. There used to be overlap"*.

The rest of the participants [11] believed the standard did not affect the nature of work. This belief was based on different perspectives. First, respondents thought ISO was irrelevant since it was about compliance to standards: *"…ISO does not involve a relevant item. It only asks you about a particular issue, how it is saved and implemented…"* (Participant 11). The other group believed change was not possible because ISO fixed the situation. In other words, it made the routines obligatory since auditing was performed to check compliance: *"we still have the same routines running. ISO contributed to fixing them in the system"* (Participant 18). A third perspective attributed the absence of impact to the fact that the implementing DGs (DG1 and DG2) had to work with other DGs and bodies that did not implement ISO. According to Participant (5): *"sometimes we do have to work with units that implement the standard and*

sometimes with others that are not implementing it like the Directorate-General of Information Technology". This meant control could not be exercised throughout the whole chain. The last group said no effect was observed because their units had already been process-oriented before ISO implementation: *"ISO did not have effect on activities and work mechanisms. It introduced documentation only. We had our goals, plans and work schedules. It [ISO] added documentation, encoding and other quality aspects"* (Participant 27).

Examining results by DG showed no notable differences. However, among those indicating the standard had no impact on the nature of work, the majority of those considering ISO irrelevant came from DG2. Similarly, those who considered ISO contributing to fixing the routines came from DG2. On the other hand, those who credited it to being already practised before ISO implementation came from DG1. Interestingly, the informer revealed that the shift toward process-orientation was a planned objective for the implementation of ISO:

"before implementing ISO, we studied different systems and realised that organizations implement ISO as a transition. Therefore, we selected ISO. We recognized this [improved process-orientation] from the very beginning. Recently, we have established a section for continuous improvement, which is concerned with development".

4.6.5 Multidisciplinary Behaviour

When talking about multidisciplinary behaviour, 28 respondents indicated that their job either encouraged or required this aspect. Participant (27) provided an example: *"this is a very very very important feature…In my department there are some people interested in media, which is an advantage…the person handles our publications internally. We try to make use of such talents when we know about them"*. The responses provided some insights on how multidisciplinary behaviour added value to the organization. According to Participant (13), inter alia, multidisciplinary behaviour enhanced variety: *"this is an advantage because these people can give more. They can provide ideas and opinions from different perspectives because of the various accumulated expertise and knowledge"*. It simply referred to having a wider perspective (richness) due to multidisciplinary behaviour. Others believed multidisciplinarity enabled better

internal mobility: *"an employee who understands more than one work is distinctive. I say that based on experience. Some confine themselves within a specific context and suffer when moved"* (Participant 30). It seemed that multidisciplinarity also enhanced self-organization, Participant (21) explained: *"…we have some employees with IT background. They help us with IT issues. When a problem happens to the systems, they solve it"*. This eradicates the need to wait for support from another unit which might come late. Finally, with variety, richness and self-organization came improved resilience:

"for management, such a person [multidisciplinary] is a joker. Some issues require such people. These people increase flexibility and assurance in work. They work with ease and do not stop at an obstacle. They do not need any help from another department or any other place" (Participant 26).

Some participants believed management played a key role in facilitating multidisciplinarity. According to Participant (7): *"…some seniors find these talents and nurture them through training. Others ask employees to perform routine work. We try to create multidisciplinarity in our department…"*. On the other side, some responses thought multidisciplinarity depended on the employee her/himself: *"it depends on personal talent. It is about readiness and tendency…"* (Participant 20). Another group admitted that multidisciplinarity was an advantage, but thought it added a burden to employees: *"…it [multidisciplinarity] helps you cut time, but the negative side is increased work"*. This seemed the reason for some resistance among employees like Participant (31): *"here we do everything. We'll probably have to do the cleaning work also. Some employees accept that to avoid conflict with top management and others resist and find themselves marginalised. I have no problem with that [marginalization]"*.

In contrast, only 4 people described their units to be monodisciplinary with people doing the same procedural work: *"multidisciplinarity makes no difference here. We all perform the same tasks"* (Participant 22). Looking at data by DG illustrated that DG1 was perceived multidisciplinary by all its participants [16], while 12 from DG2 thought the same (less by 1/4). The informer showed that multidisciplinarity had become a work requirement under knowledge management: *"this is an ISO 9001:2015 requirement which addresses risk and knowledge, both explicit and implicit. Employees have been moved from a position*

to another. Exchange of positions and knowledge is a requirement in modern management".

4.6.5.1 ISO Impact

From 29 responses, only 8 said ISO implementation had had positive impacts on multidisciplinary behaviour. The main argument was that ISO, through knowledge management, enhanced multidisciplinarity: *"ISO diagnosed the needs of a job. So, every employee is now part of more than one job title based on his skills. It also identifies missing skills and makes sure they are compensated"* (Participant 8). According to Participant (30), ISO played a role in improving self-organization: *"it identified the person responsible for a procedure and a second one to replace him. This aimed at continuity of work. That is positive indeed"*. This resulted in wider expertise. Another perspective praised ISO for augmenting visibility which meant easy location of expertise*: "there is an impact. Now when you have any problem, you know where to go for help"* (Participant 26). Others argued that ISO introduced a mentality shift:

"ISO motivated talents to participate. A girl I mentioned to you came to us after ISO implementation and offered preparing Excel sheets. Another girl went through the regulations and found a problem that we fixed. If it was not to ISO, we would have continued the same approach" (Participant 7).

In contrast, 5 people perceived negative effects of the standard on multidisciplinary behaviour. According to this group, ISO limited multidisciplinarity as it emphasized alignment between qualification and job title: *"ISO limited this [multidisciplinarity] and some employees were moved. For example, we had a colleague with a qualification in IT. She was moved from our section to an IT section"* (Participant 21). The rest of participants, who were the majority, believed ISO had no impact on multidisciplinarity. The respondents presented two main thoughts here. The first group looked at ISO as irrelevant since it only dealt with compliance. According to Participant (29): *"there is no effect. We write the procedure and ISO checks compliance. The standard organizes the work only"*. The second view considered multidisciplinarity to be a management issue. They thought the person in charge (e.g. director) could harness this aspect. In this regard, Participant (3) said*: "…here comes the role*

of the leader. He can utilise the different skills of the employee. It depends on role and authority assignments…".

A close look at the results showed that more participants from DG1 thought that ISO had positively impacted multidisciplinarity, 6 for DG1 and 2 for DG2. The figure improved slightly for DG2 when considering the ISO 9001:2015 version from 2 to 3. Still they were half the number of those from DG1. 4 people from DG2 believed ISO had negative effects on multidisciplinarity in comparison to 1 from DG1. Almost the same number of respondents thought there was no impact for ISO on multidisciplinarity, 8 for DG1 and 7 for DG2. The figure improved for DG2 with the latest version of the standard. Overall, ISO seemed to have no effect on multidisciplinarity within MoE. In contrast, the informer thought ISO had affected multidisciplinarity, particularly with regard to knowledge accumulation and location: *"ISO plays a role through access as everyone can see the performance level through results, including the beneficiary. ISO has organized knowledge management"*.

4.6.6 Cross-functionality

29 participants ensured that cross-functionality was exercised in their units. The responses also revealed that due to the financial difficulties, less cross-functional teams were observed: *"we do have such teams [cross-functional]. Most work is completed in teams. We used to have more teams before the current [financial] difficulties"* (Participant 25). The decreased dependence on teams was most likely due to their cost, whether direct or indirect costs (e.g. remuneration and working hours). Another group indicated that cross-functionality was a requirement, as Participant (16) explained: *"that is a requirement. A team includes various thoughts rather than having 1 department deciding. All concerned parties are represented, which leads to a decision better than one made by 1 department"*. A third group thought that cross-functionality was utilised based on the nature of work. According to Participant (1): *"it depends on the nature of performed work. If it needs cross-functionality, then a team is preferred. But if the work does not require varied specializations, then the relevant unit will deal with it…"*.

In terms of the advantages of cross-functionality, some viewed it as a capacity building mechanism. These teams were believed to facilitate access to information and expertise and enrich employees through knowledge transfer*: "…by being represented in the team, we become acquaint with information flow. We can also provide others with our data. Thus, we get an opportunity to acquire knowledge and expertise"* (Participant 9). On the other hand, some participants believed that cross-functional teams caused delays, according to Participant (11): *"these teams are good, but if something takes a week to complete, in a team it will take a year. Those from the same specialization have unified thoughts, while having various thoughts delays the issue"*. This might have been related to the absence of 'meeting management' as other cases showed the opposite like the example below.

"…for example, we had an issue relating to the job titles of computer technicians. Some were supposed to be employed as computer technicians and others as support technicians. One feels it is a simple issue since names were available in the database. So, job titles could be changed and that's it. But, a mini team was formed which included 4 Directorate-Generals. They found that the changes will result in different salaries and job ranks. Which was unfair for some. Hence, the final decision was reliable as it covered all aspects" (Participant 32).

In contrast, 3 participants pointed that cross-functionality was not exercised in their units. This group believed cross-functionality was not required in their work due to the nature of the work. In fact, 2 out of the 3 respondents opposed cross-functionality. According to Participant (19), *"…I have never come across teams…I don't think these teams are useful…these teams need to be reconsidered, though I am not trying to underestimate the efforts of my colleagues in the Directorate-Generals using such teams"*. Examining results by DG showed little differences as all participants from DG1 ensured cross-functionality was common within their units, in comparison to 13 from DG2. The informer acknowledged the practice of cross-functionality, though seemed to be to some extent opposing it: *"cross-functional teams do exist, but I prefer work through functional units because it ensures continuity, grows employees intellectually and avoids overlooking them. However, if the nature of the work requires a team, then I agree"*. It was unclear why the informer thought of cross-functionality as hinderance to employee growth, which is highly debatable.

4.6.6.1 ISO Impact

From 29 responses, as many as 12 believed ISO implementation had positively impacted cross-functionality. This was perceived in different ways with the first thought to be encouraging cross-functionality: *"I can tell there is an impact. At the current stage, the system [ISO] calls for cross-functionality"* (Participant 16). Others indicated that the standard organized cross-functionality by ensuring that the relevant parties were included in teams, according to Participant (1): *"it [ISO] organized teams and checked whether concerned units are represented"*. Others like Participant (5) demonstrated that by improving visibility, ISO had put more emphasis on cross-functionality: *"…why are these teams formed? These are formed because of the problems and risks ISO made visible. ISO highlighted these through its operations"*. The same person who criticised teams for delaying work in the previous section, Participant (11), clarified that the standard improved cycle times in cross-functional teams by setting time schedules. According to him: *"it [ISO] has played a major role. It holds you accountable for delays. You may get a non-conformance…"*. The belief here is that ISO tuned performance. Participant (3) raised a similar point showing that ISO improved follow-up mechanisms, which improved team performance: *"after the implementation of the ISO system, teams are required to introduce analysis and recommendations…"*. The last advantage mentioned by participants was recognition. It seemed participants looked forward to having their teamwork recognised in the ISO report, Participant (7) elaborated:

> *"for ISO, when we form a team, we try to include people from the department of quality or others with experience. We try to introduce any teamwork to the auditor when s/he comes to our department. We need to make sure the auditor knows about it, therefore, we mention it to her/him"*.

In contrast, only 1 participant believed ISO had negatively impacted cross-functionality by emphasising specialization. According to Participant (21), *"it [ISO] prioritised specialisation. For example, when I visit another Directorate-General, I only see those from my own specialization"*. On the other hand, more than half of the responses indicated that ISO had had no impact on cross-functionality. First, some thought the standard was irrelevant: *"it [ISO] does not*

address this. Teams are temporary and added work, beside the work ISO require" (Participant 29). Others referred to the absence of impact due to the limited scope of the standard, which covered only 2 DGs, as Participant (30) said: *"the system [ISO] is implemented in 2 Directorate-Generals. Most teams come from other Directorate-Generals that still have no idea about the system"*. The last group looked at the standard as a formality, which did not change anything: *"it [ISO] did not change anything. Actually, I am extremely surprised because you keep asking about the impact of the ISO system…auditors only come to ask for papers. I hope they come to follow-up on implementation"* (Participant 6).

Closely looking at the results showed that the standard had partly impacted cross-functionality, with DG1 being slightly more positively impacted than DG2 (7 in comparison to 5). Similarly, no participant from DG1 raised any negative effect, while 1 from DG2 did so. For those who said no impact was observed, those coming from DG1 hinted they had always incorporated cross-functionality in their work even before implementing ISO. The informer agreed that ISO did not play any role here as it was not a focus for the system: *"ISO has not played a clear role here in internal and external audits. We have just started realizing our final goal, continuous improvement. We have managed to win employees and are working on digitizing the quality management system"*.

4.6.7 Expertise-utilisation

Most participants [20] suggested that their units utilised expertise to a great extent; some described it as perfect. Participant (9) described her own experience: *"…I have experience in design, designing infographics. I made some designs that received great resonance, and the Directorate-General adopted it. I also do video design and trained all employees on that"*. The discussions highlighted several features of expertise-utilisation within the organization. Responses indicated that expertise-utilisation was cross-sectional in the whole organization, Participant (32) explained: *"…if an employee from another department did a study, we make use of her/him. We utilise his specialization to improve. The same applies for those participating in teams and committees outside the ministry. We may benefit from them here"*. According to respondents, expertise-utilisation provided variety in views and access to information which

facilitated decision-making: *"getting in touch with the environment and staff helps making a decision or managing an activity"* (Participant 13). Others pointed to expertise-utilisation during difficult times. According to Participant (23), *"I can tell there is utilisation. When we face difficulties, we refer to the members with more expertise. Even the seniors refer to them"*. Participants also talked about the role of expertise-utilisation in training and knowledge transfer: *"…anyone with some knowledge or expertise can transfer it to others. Thus, we make savings and build capacity. This saves a lot for management…"* (Participant 27).

On the contrary, 12 respondents complained about the absence of expertise-utilisation within the organization. Participant (21) commented: *"at the ministry level, utilisation is not as expected. They believe new minds are better than those who came first"*. Participant (2) showed how this led to the loss of key employees: *"…I always talk about that. We suffer from a big migration. Many leave the ministry toward other organizations, where they get more privileges. There, they are treated as experts, while here you don't get the same treatment"*. Another perspective pointed to monopoly by seniors who give no space for others and exclusively practised power: *"…there is monopoly; a person considers himself to be a superman and handles everything…for example, it is impossible that a Director-General will give the chance for an employee to manage a meeting…"* (Participant 11). Participant (3) referred to these practices as management style. He believed that some managers or leaders considered utilising expertise while others did not.

"it depends on the leader, director or the Director-General, and how he utilises available expertise; how to use those with qualifications and experience to facilitate decision-making. It all depends on the leader himself. Unfortunately, in our ministry some units do not make good use of people, besides not engaging them in decision-making, though they are qualified with postgraduate degrees alongside long experiences".

In general, no differences between the two DGs were observed. Yet, responses from DG1 engaged in discussions related to the role of management, knowledge transfer and risk management, while respondents from DG2 talked about expertise-utilisation as a procedure of referring to a colleague for information. The informer explained that the organization sought to maximize employees' conviction of worth through utilization of their

expertise: *"this is based on conviction and the organization should maximize employees' conviction through promoted communication"*.

4.6.7.1 ISO Impact

From 31 responses 13 perceived ISO implementation to have had positive impacts on expertise-utilisation. The main effect was thought to come from the introduction of knowledge management: *"in the new standard [ISO 9001:2015], every unit must make use of the various expertise of its employees. This is what we call the risk man. The standard introduced a new item known as knowledge management to utilise capacities"* (Participant 5). According to Participant (22), *"after implementing ISO, we witnessed mutual utilisation, which resulted in good practices following the exchange of ideas. Before ISO, there was no utilisation…"*. Others believed that ISO via employee engagement improved expertise-utilisation: *"…employees have ideas and they study how to overcome challenges. Some solutions come from executives, not supervisory staff…"* (Participant 30). The main idea here was that when you engage employees, you exploit their capacities. Similarly, Participant (17) indicated that training requirements imposed by ISO resulted in better expertise and then utilisation: *"ISO mentions refining expertise through training courses. This contributes to enhanced productivity in general"*. One participant pointed to recognition by the ISO report as an effect enhancing expertise-utilisation. Since the report praised such practices, it seemed management was trying to better integrate expertise-utilisation: *"since this is considered an added value for our department, I can say yes ISO has impacted this aspect"* (Participant 9). One of the main effects of ISO implementation was consistency of performance, which respondents believed had positively impacted expertise-utilisation. This was particularly relevant to self-organization measures ISO required.

> *"…when the auditor asks me about an issue that I am supposed to replace someone else in special cases, I must be as competent as my colleague…on one occasion, the current head of section replaced the former head. He did even better than the former head himself"* (Participant 19).

In contrast, 18 respondents reported that they observed no impact for ISO implementation on expertise-utilisation, Participant (6) said: *"it [ISO] has not played any role. We have implemented it for 3 years now and no change is observed.*

The same routine is continuing". Participants attributed that for not being a requirement by the standard: *"honestly speaking, ISO has not changed that because it does not require it. That's the problem; whatever is not an ISO focus, the organization does not pay attention to in general…"* (Participant 2). Others referred again to ISO as a formality and documentation system, which had nothing to do with expertise-utilisation. According to Participant (11), *"…the system depends on documentation. I do not think it has any relation with improving work. It only addresses implementing the set plan and goal"*.

Looking at the results by DG showed slight differences. However, when considering the difference between the 2008 and 2015 versions of the standard, a shift occurred for DG1. For the 2008 version, 6 thought it had positively impacted expertise-utilisation, while 10 did so for the 2015 version. This showed better results for DG1 in comparison to DG2 (10 for DG1 in comparison to 7 for DG2). Besides, for the group suggesting no impact was observed, those who considered the standard to be irrelevant came from DG2, while those from DG1 attributed it to management style or to the fact it was already practised before introducing ISO. The informer disagreed with the results, explaining that ISO facilitated access to expertise and knowledge: *"ISO archived the existing expertise, both explicit and implicit, which created a guide to utilize existing cadre"*. The difference in opinions is thought to come from the different perspective. Employees consider their own under-utilization, while the informer talks about the macro level utilization of organizational capacity.

4.6.8 Changeability

In terms of change-readiness, 26 of the participants believed that their units were adaptable. According to Participant (10): *"the organization enjoys a capability to change. In fact, there are efforts to pursue that [changeability] as directives ask for development"*. An example was provided by Participant (13) who described a change event: *"…we managed to change during the economic crisis. We reduced paper consumption and shifted to electronic work"*. Participants related adaptability to many factors, with one being top management's engagement and commitment: *"when we are faced by challenges, we raise them*

to the quality council and quality committee, and a decision is made. This is an ISO focus, to have leadership supporting when dealing with challenges" (Participant 3). Responses also indicated richness as a factor, Participant (1) commented: *"we are not suffering during the crisis because the organizational structure has not been affected. That's because we are rich in human resources…the organization is adaptable"*. Another perspective pointed to employees as the driver for change: *"change starts from the employee. It is important to have employees who are convinced. Here employees are convinced because we have no other choice"* (Participant 22). At the same time, some respondents thought that changeability was dependant on top management's vision, explained Participant (17): *"it [adaptability] depends on the vision set by top management. When they decide to go for it, they inform us and provide the methods to keep up with the new conditions"*. The last group linked adaptability with incentives showing that employees need to be encouraged to adopt new work methods: *"we are adaptable, but that requires incentives…adding a burden without rewards cannot work…some employees are forced to stay after working hours…"* (Participant 6).

On the other hand, 6 respondents believed their units did not exhibit adaptability. According to Participant (25): *"change is a bit slow. And if it is a radical change, it requires a long time. It depends on the nature of change, but flexibility and fluency are missing"*. The first and main reason for the absence of adaptability was thought to be external legal frameworks like government laws: *"adaptability is very weak due to laws that restrict manoeuvrability…"* (Participant 20). Another reason was workload, as Participant (16) described: *"for example, I believe that because of the workload in our DG [DG2] or department, we cannot be adaptable. We do the same routines and no new employees are recruited because of the crisis. Therefore, we have more work"*. One last perspective indicated that change was impossible due to the rigidness of the organizational culture: *"our environment is not affected neither it affects. It keeps going with the same routine. The crisis has only affected recruitment, while the rest is fine. The culture is rigid, unchangeable"* (Participant 18).

Breaking down the data by DG showed some difference as 15 out of 16 from DG1 thought their units were adaptable, in comparison to 11 out of 16 from DG2. This means that out of the 6 people pointing to the absence of adaptability, 5 came from DG2. The informer argued that adaptability in DG1 was perceived better than DG2 due to planning and engagement: *"change is led by top management. We prepared a 100-goal 5-year plan for the Directorate-General of Planning [DG1]. Change is complex and uneasy, and there is resistance. Change starts with goal formulation and employee engagement"*. However, having a 100-goal plan can explain the burden some employees complained about.

4.6.8.1 ISO Impact

Almost two-thirds of the responses [19/30] perceived ISO to have positively impacted adaptability. Respondents reported several observed effects they believed the standard introduced. First, participants indicated leadership's involvement as a key effect: *"leadership chaired by the minister herself and also her deputy provide support when we face any challenge"* (Participant 3). Another effect came from a shift in focus caused by ISO implementation. The organization appeared to become more beneficiary-centric, according to Participant (19): *"ISO aims at beneficiary satisfaction, which is also achieved via another ISO principle, transparency…this realises the core of quality"*. The majority of this group indicated that continuous improvement, an ISO requirement, drove change and enhanced adaptability therefore: *"ISO has impacted through the continuous improvement item, which relates to adaptability. It studies the current situation and then improves it"* (Participant 28). Another positive impact was the follow-up loop ISO provided, which led to continuous feedback. This feedback was fed again into the improvement cycle. In this regard, Participant (17) said: *"ISO works to change. I know about a lot of correspondences raised by the ISO team to top management, which resulted in good decisions. We can notice change"*.

Participant (1) added improved visibility caused by ISO as an impact that enhanced adaptability: *"since ISO identifies the root cause, the cause is discussed during meetings (e.g. overlap between specializations). This leads to change. So,*

ISO causes change by finding the problem". Similarly, it was thought that because of enhanced visibility, accountability was set, which meant people had to comply to the standard and improve their processes: *"…everyone tries to avoid a non-conformance or no improvement case. Because he would be blamed by his colleagues for causing a failure. This has created a positive competition"* (Participant 30). Others believed ISO enhanced richness and self-organization, which meant rapid change when needed, Participant (22) noted that: *"ISO helped us achieve the same goal via various means. It simplified and organised work to achieve beneficiary satisfaction"*. The last impact was perceived to stem from risk management, which was introduced in the latest version of the standard (9001:2015). Since processes needed to be ready for risks, they should have been change-ready. According to Participant (9): *"this [change-readiness] goes under risk management. Now we have an item entitled risk management"*. On the contrary, only 1 participant believed ISO had negatively impacted adaptability. The argument was that ISO had fixed operation within a set inflexible procedure. The quote below better described the situation from the participant's perspective.

"ISO sometimes restricts you. There are procedures you must perform, but for a reason or aim you did not do so. ISO will label that as a non-conformance. You might not have done the visit to avoid a bigger problem or issue. For example, a negative reaction…it [ISO] treats that as a mistake" (Participant 24).

The other participants [10] considered ISO implementation to have had no impact on adaptability. Some looked at it as irrelevant, like Participant (12) who said: *"ISO is about implementing programmes and activities. I have not noticed that it cares about development…"*. Others thought the impact was not as expected: *"in reality, ISO has had little impact, though I do not deny its positive effects. But that is still not as expected"* (Participant 20). Some attributed the absence of effect to the fact that change is in the end determined by management: *"change is at the end a senior decision. Those in charge decide"* (Participant 16). Participant (25) raised the lack of integration as a cause since the standard is only implemented in two DGs: *"I think it [ISO] still needs time because it is not applied organization-wide. Hence, impact is not evident"*. The rest observed no impact because their units had been adaptable for years even

before implementing the standard as explained by Participant (23): *"no impact; this is part of our Directorate-General's [DG1] work. We have always predicted and planned for risk, and then acted"*.

A close look at results showed no differences in general with 9 from DG1 and 10 from DG 2 indicating positive impacts, while only one from DG1 pointing a negative effect. Of those who believed there was no impact, 6 came from DG1 and 4 from DG2. However, the 6 from DG1 explained that the absence of impact was because adaptability had been always present in the DG even before introducing ISO. The informer provided an interesting remark showing that ISO contributed to more confidence which in turn contributed to improved adaptability, as he suggested:

"ISO has played a role by providing confidence that our performance meets a high standard and helped us add value. Recently, a ministerial decree was issued to restructure the Directorate-Generals of Planning [DG1] and Administrative Affairs [DG2] based on ISO results. Everyone is committed to ISO and specializations have developed".

4.6.9 Leadership's perception

After investigating the main features of the organizational structure, a further step was understanding whether top management embraced routine- or process-orientation. Out of 29 responses, 22 believed top management was satisfied with the current situation. According to Participant (28): *"…top management is tremendously supporting; in fact, they came with the system [ISO]. Their commitment and follow-up prove that. They always provide whatever the system requires"*. Similarly, Participant (12) expressed positive comments: *"top management is happy with the current situation since more authority has been granted to directors"*. At the same time, others suggested that top management is continuously seeking improvement: *"they [top management] seek to improve; everyone aims at that. At the department level, I can feel it"* (Participant 13). Participant (2) added an interesting point: *"top management has decided to expand the system [ISO] to all DGs based on the benefits found…they [top management] also consider implementing the EFQM excellence framework, though that's not official yet. We have a bigger awareness now"*. Others thought it was difficult to judge top management's level of satisfaction/dissatisfaction since

that is a relative issue: *"even when they express satisfaction for some aspects, you never know their real internal convictions…"* (Participant 7). The last group believed top management was satisfied, but thought satisfaction was one-sided ignoring employees' needs.

In contrast, 7 respondents perceived top management to be dissatisfied with the current situation. According to Participant (1): *"I see that the organizational structure is unstable. That's evident by the rapid changes which reflect dissatisfaction…"*. Participant (18) added: *"I conclude from those close to me, the director, that they [top management] are not happy with the current situation…"*. Some admitted that top management was trying to introduce change but attributed that to the presence of too many problems: *"they do seek to change the system to be more organised and reduce processing time"* (Participant 15). Others believed top management was forced into the current uncomfortable situation due to external factors like the financial difficulties, as Participant (16) explained: *"no one wants to keep the same routine. As I said, the crisis forces top management to maintain the current situation. But there is ambition for change"*. However, some strangely blamed the current bureaucratic situation and at the same time opposed change: *"top management seeks to introduce change while employees have to bear the burden"* (Participant 17).

Looking at data by DG, there was a large difference as 14 out 15 from DG1 considered management to be satisfied with the current situation, while 8 out of 14 from DG2 thought so. Similarly, out of 7 saying that top management was not satisfied 6 came from DG2. However, it is not known whether satisfaction is caused by the routine-culture, underperformance or any other issues. The informer pointed to resistance and its causes as the drivers of satisfaction/dissatisfaction, which he thought was an issue in DG2:

"I will take you back to employees' qualification and experience which govern complaint and resistance to development. In the Directorate-General of Planning [DG1], most employees are young with university qualifications. We also have clear plans and work cycle, which makes it easier. I think it is about resistance not leadership".

4.7 Summary of results

The analysis provided a lot of outputs relevant to answering the research questions. To better grasp the outcomes of this chapter, the results[10] are summarised. First, in terms of the organizational structure. The analysis showed the following:

1. Overall, communication flow was highly horizontal and smooth in the organisation. However, horizontality was considerably higher for DG1 than DG2. Regarding ISO impact, the standard seemed to play a key role in the established flow of communication with a high impact.
2. In terms of employee engagement, the organisation seemed to have very engaged people. ISO implementation seemed to play a moderate role. This impact was higher for DG1.
3. The organisation scored badly when it came to employee empowerment; empowerment was low within the environment. ISO also seemed to have little impact on this aspect, although it moderately improved the situation in DG2.
4. The investigation into routine-/process-orientation in terms of the nature of work showed a division between DG1 and DG2, with the first being very highly process-oriented and the second highly routine-oriented. The ISO standard was found to have high impact, either by enhancing process-orientation in DG1 or by introducing continuous improvement to DG2, thus, presenting some aspects of horizontality.
5. In relation to multidisciplinarity, the organisation was very highly multidisciplinary, with DG1 being notably more multidisciplinary than DG2 which was high in multidisciplinarity. ISO was found to have little overall impact on the aspect, while no impact for the standard was observed in DG2.

[10] Extent of impact was based on proportion of responses for or against as follows: 0.2 = little impact; 0.4 = moderate impact; 0.6 = high impact; 0.8 = very high impact. For detailed figures of responses, refer to Appendix F.

6. The organization looked very highly cross-functional, especially for DG1. The ISO standard had little impact here, though it did moderately enhance cross-functionality in DG1.
7. In terms of expertise-utilisation, the organisation took great advantage of the expertise of its employees. The ISO 9001:2008 standard had little to moderate impact on expertise-utilisation, while the 9001:2015 version had a slightly better impact (moderate). The impact of the latest version was high in DG1.
8. For change-readiness, the results showed that overall the organization was highly adaptable, yet DG1 was considerably more change-ready compared with DG2. ISO seemed to have a high impact on this aspect, though the impact for DG1 was moderate.
9. Finally, leadership in DG1 was thought to be very satisfied with the current situation (process-orientation), while leadership in DG2 was moderately satisfied with routine-orientation.

Second, in relation to resourcefulness, the results presented these findings:

1. The organization deployed risk assessment, with DG1 being very highly engaged in that while DG2 is highly engaged. Overall, the ISO 9001:2008 standard moderately impacted the practice of risk assessment within the organization, though its impact on DG1 was low and high on DG2. The 9001:2015 version, on the other hand, had a better effect on both DGs, with DG2 still being better. For the latest version, the impact on DG1 was moderate.
2. The results showed that the organization was very highly engaged in resource mobilization. ISO had little effect here.
3. In relation to organizational learning, the results revealed an organizational environment that embraced learning. Though DG2 was better in this aspect, both DGs enjoyed a very good learning environment. ISO proved to be crucial through its high impact on organisational learning.

4. The organization exhibited very high levels of sensemaking across the two DGs. The ISO standard was found to play an important role through high impact.
5. Both DGs were practising self-organization techniques. ISO was thought to have an overall moderate impact here, but the impact for DG2 was greater. The results suggested that self-organisation was instrumental for resourcefulness, hence, for resilience.
6. Creativity and innovation were highly present in the organization. Overall, ISO had a moderate overall impact, though its impact on DG2 was high.
7. In general, the organization was highly engaged in entrepreneurial spirit, though DG1 was higher in that. ISO had low impact over this aspect in DG1 and no impact in DG2. The results showed that entrepreneurial spirit played an important role when it came to overcoming challenges.
8. The organization seemed to exhibit high mindfulness in general with DG1 being high and DG2 moderate on the aspect. ISO looked to have moderate effect on mindfulness. The results revealed that mindfulness when enhanced promotes openness to change.
9. In terms of coupling, the organization was moderate showing a mixture of both tight- and loose-coupling across the two DGs. Overall, ISO had little effect on coupling, though for DG1 the impact was moderate. The two versions of the standard had somewhat similar effects on coupling.
10. In terms of overall resourcefulness, the organisation was highly resourceful. However, DG1 was higher in this aspect. ISO had a high impact here, though for DG1 the impact was very high.

To summarize, the results above suggested a number of key findings:

1) ISO implementation seemed to be more successful and fruitful under process-orientation and to some degree under semi-process orientation, while it looked inconsistent under routine-orientation.

2) Overall, ISO implementation managed to consistently drive the organizational structure toward higher levels of process-orientation for DG1, while it failed to move DG2 to the same level; however, it seemed to push a unit within DG2 toward semi-process-orientation.

Informer's reflection:

"I support these logical outcomes. I refer it to the nature of work, beside response to change. Qualifications play a role and generate flexibility. Type of human resources and tasks can impact tremendously. In the Directorate-General of Administrative Affairs [DG2], they are required to perform routine work, while here [DG1], our cadre support us to realize better results".

3) Routine-orientation seemed to contribute to less resourcefulness, while process-orientation seemed to contribute to more resourcefulness.

Informer's reflection: *"this relates to fact-based work, which facilitates dealing with difficulties. Process-orientation is about facts, while routine-work is more about firefighting and immediate solutions. We have planned solutions since we predict problems"*.

4) Although DG1 seemed more resourceful than DG2, the impact ISO had on the two DGs was almost equal, suggesting that at a certain point, when units became very highly process-oriented, ISO impact faded or disappeared as units had already been beyond that level before ISO implementation.

Informer's reflection: *"I agree with that. We [DG1] do not feel that ISO requires many of the things we do; our own requirements demand that"*.

5) The main roles for ISO in relation to resourcefulness were enhancing process-orientation and ensuring consistent practice of risk management across the organization.

Informer's reflection: *"I support this conclusion. Auditing risk and knowledge is practised though it is relatively new. In relation to enhancing process-orientation, as I said, this is witnessed"*.

6) The organisational structure seemed to play the most important role by indirectly moderating the relationship between ISO implementation and resourcefulness, besides directly impacting resourcefulness.

Informer's reflection:

"I support this finding. I was reading a Harvard article on employee loyalty. Some companies collapse, and others survive, and they found the work environment to be the reason. Loyalty results from career security and cohesion between management and staff. The work environment plays a decisive and critical role".

7) The relationships between ISO implementation, resourcefulness and organizational structure were exponential, where a minor change in the organizational structure or ISO implementation level could tremendously affect the other factors.

Informer's reflection:

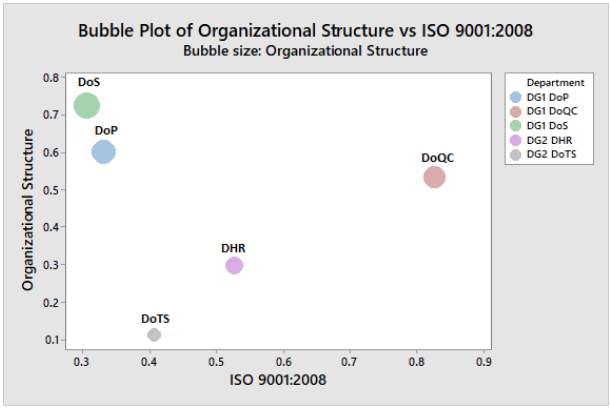
"this is how it is supposed to be. If the work environment, for example, is unstable, work would be performed under authoritarian management. The environment either becomes a source of success or failure based on human relations, ideas and interaction between the top and bottom. I feel the work environment is a catalyst for the realization of outcomes. Under a perfect work environment anxiety retreats and work goes on smoothly".

The comment shows the importance of social relationships in both performing tasks and overcoming difficulty. It may sometimes overweigh organizational motivation.

Figures 4.1 – 4.4 below (generated in Minitab 18) show ISO's impact on both process-orientation and resourcefulness at department level. Figures 4.1 and 4.2 show how the two versions (2008 and 2015) of the standard had impacted process-orientation. The x axis shows ISO's impact, where 0 means no impact and 1 means perfect impact. The y axis refers to the level of process-orientation, where -1 (not shown since all figures were above 0) refers to perfect routine-orientation and 1 to perfect process-orientation. Bubble size also represents the level of process-orientation, where bigger bubbles represent higher levels of process-orientation. Figures 4.3 and 4.4 show the impact of the two versions of the standard on resourcefulness. The x axis represents the extent of ISO impact, while the y axis represents unit's

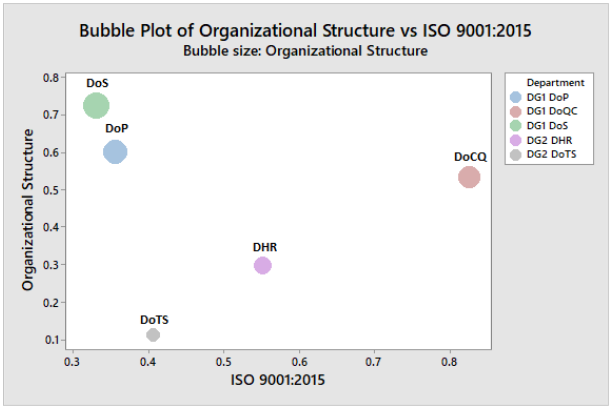
capability to deal with difficulties (resourcefulness). Here, -1 refers to incapability to deal with difficulties, while 1 indicates perfect capability. Bubble size also refers to resourcefulness. Note, two departments (Ds) were not plotted due to the very small number of participants from these Ds[11].

Figure 4.1: Process-orientation level and how ISO 9001:2008 contributed to it (at D-level).



Source: Author.

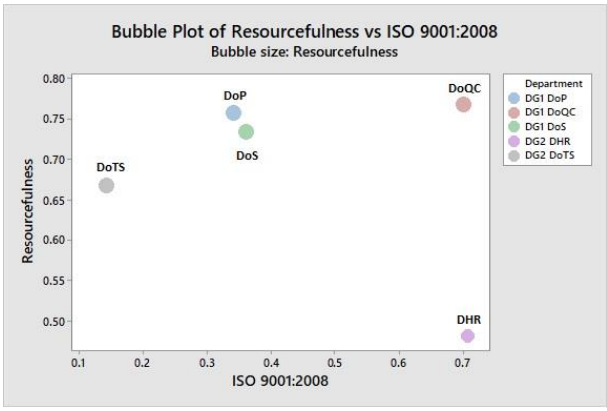
Figure 4.2: Process-orientation level and how ISO 9001:2015 contributed to it (at D-level).



Source: Author.

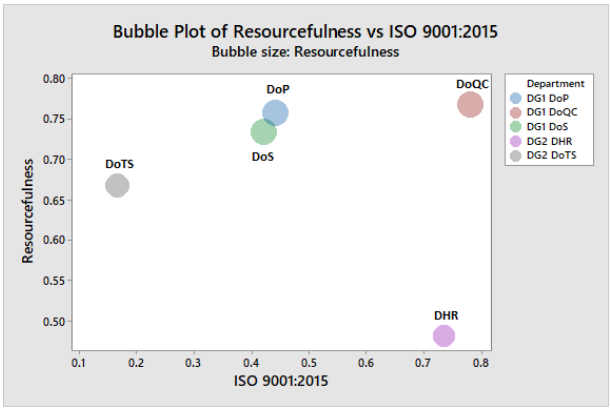
[11] **DoQC** = Department of Quality control; **DoP** = Department of Planning; **DoS** = Department of Statistics; **DHR** = Department of Human Resources; **DoTS** = Department of Transport and Services.

Figure 4.3: ISO 9001:2008's impact on resourcefulness (at D-level).



Source: Author.

Figure 4.4: ISO 9001:2015's impact on resourcefulness (at D-level).



Source: Author.

4.8 Chapter Summary

Chapter 4 conducted data analysis and presented results and findings. The results and findings of this chapter set the basis to answer the research questions in the following chapter. In relation to research question 1, the analysis tackled the main processes and attributes identified in Chapter 2: problem identification and prioritization, resource mobilization, organizational learning, sensemaking, self-organization, creativity and innovation, entrepreneurial spirit, mindfulness and coupling. Similarly, in relation to research question 2, the main constructs of organizational structure were

addressed. These were: communication, employee engagement, employee empowerment, nature of work (routine-/process-orientation), multidisciplinary behaviour, cross-functionality and change-readiness. Analysis in relation to research questions 3, 4 and 5 sought evidence in relation to the role of self-organization and entrepreneurial spirit in resilience, and the role of mindfulness in openness to change. The following chapter answers the research questions, discusses the findings and concludes the study.

Chapter 5: Discussion and Conclusion

5.1 Chapter Overview

Building on the literature review, methodology and findings from Chapter 4, this chapter discusses the outcomes of the research and answers the main research questions regarding the impact of ISO 9001 implementation on resourcefulness, and the effect of process-orientation on the relationship between ISO 9001 implementation and level of resourcefulness. It starts with a summary of the study in section 5.2. Then, section 5.3 discusses and interprets the answers to the research questions. It also relates the findings to extant literature. Section 5.4 introduces the research contributions. Section 5.5 previews the implications of the research findings, while section 5.6 lists research limitations. Next, section 5.7 suggests directions for future research. Finally, the chapter ends with the researcher's concluding remarks.

5.2 Summary of research

With growing uncertainty, the concept of resilience has become of importance to researchers and practitioners (Ponomarov, 2009; Goetsch and Davis, 2014; Kantur and Iseri-Say, 2015; Sahebjamnia et al., 2015; Hosseini et al., 2016). It originally started in psychology more than four decades ago; the concept has spread to various fields including management (Coutu, 2002; Bonilla, 2015) relating to the ability to withstand against and recover from adverse conditions in organizational context (Coaffee & Bosher, 2008). Organizational resilience is a risk management approach (Mitchell and Harris, 2012) dealt with under the broad field of risk and uncertainty. According to The Global Risk Report (2013) and Howell (2013), robustness, redundancy, resourcefulness, response and recovery are the components of organizational resilience. Kantur and Iseri-Say (2012) and Wicker et al. (2013), on the other hand, limit these to robustness, redundancy, resourcefulness, and rapidity. It needs to be noted that resilience is a characteristic that can be achieved through multiple means. This explains the different models/frameworks on resilience in the literature. Resourcefulness, the focus of this study, refers to

the ability to assess risks, set priorities and mobilize resources when faced by threatening conditions (Bruneau et al., 2003). Wicker et al. (2013) consider it the most important component of organizational resilience. A closer look shows that the concept is an extension of resilience, especially, at the operational level. It defines the major processes and attributes a system requires to be resilient enough to rebound.

Research on organizational resilience has addressed, inter alia, its terminological and etymological history (e.g. Chakravorty, 2015), its definition (e.g. Vogus and Sutcliffe, 2007; Coaffee and Bosher, 2008; Helm, 2015), its types (Rose, 2004; Tierney and Bruneau, 2007; Orchiston et al., 2016) and its components (e.g. Kantur and Iseri-Say, 2012; The Global Risk Report, 2013; Howell, 2013; Wicker et al., 2013). However, most research on organizational resilience has focused on the concept in isolation from management systems and other organizational components. Most research on resilience, as reviewed in Chapter 2, has focused on the conception, benefits and demonstrated examples of resilience and resilient organizations. However, it is not until the concept is considered both holistically and at its macro and micro levels, a deeper understanding can be claimed. Although the roles of, for example, innovation and training in resilience were discussed in earlier works, no sufficient discussion was devoted to understanding interaction with other management systems/practices. The focus on the first order effect of resilience could miss other second or higher order interactions that contribute. Hence, this research introduces organizational resilience from a new perspective by examining it in relation to management systems, in particular, the ISO 9001 standard. Added to that, although the concept of organizational resilience has been addressed over recent years, resourcefulness, on the other hand, has not been studied sufficiently. Its literature consists of parts scattered across multiple texts, with little attention toward the operationalization of the concept. This study provided both a theoretical framework and a step toward the operationalization of resourcefulness and, therefore, resilience.

The research project had two main objectives, namely, 1) to identify the impact of the implementation of ISO 9001 quality management system on resourcefulness and 2) to investigate the effect of process-orientation on the relationship between quality management principles and resourcefulness. Bearing in mind these objectives, a literature review was conducted covering the theories of risk management, quality management and organizational structure, which resulted in a theoretical model covering and integrating 25 concepts from the three domains (see Table 5.1 below). The research proposed that the interaction between the three domains, through the suggested concepts, results in enhanced resilience, first, directly through implementing quality principles, and second, via the moderating role of process-oriented organizational structure.

Table 5.1: Conceptual underpinnings of the theoretical framework.

1.	Communication;	14.	Problem identification;
2.	Engagement;	15.	Improvement;
3.	Empowerment;	16.	Creativity & innovation;
4.	Teamwork;	17.	Change-readiness;
5.	Multidisciplinarity;	18.	Deference to expertise;
6.	Cross-functionality;	19.	Leadership;
7.	Fact-based;	20.	Risk-thinking;
8.	Process-thinking;	21.	Mindfulness;
9.	Integration;	22.	Sensemaking;
10.	Goal-setting;	23.	Self-organization;
11.	Ensuring capability;	24.	Coupling;
12.	Resource management;	25.	Entrepreneurship.
13.	Learning & Education;		

Source: Author.

The 25-concept framework was utilized to answer the following research questions:

1. To what extent does the implementation of ISO 9001 quality management principles affect resourcefulness?
2. How does process-orientation affect the relationship between the implementation of ISO 9001 principles and level of resourcefulness?
3. Is there evidence that self-organization generates better ability to respond to challenges within the context of this research?

4. Is there evidence that entrepreneurial spirit develops capability for survival within the context of this research?
5. Is there evidence that mindful organizations are more open to change within the context of this research?

In its quest to answer these questions, the research deployed a qualitative approach with an inductive strategy. 32 semi-structured interviews were conducted in the main field work, between November 2017 and May 2018, beside one final reflective interview in Jan 2019 as the research used an insider-outsider approach. Data collection was conducted in the Oman Ministry of Education (MoE), which implemented ISO 9001 in 2014. Being the largest public civil entity in the country in terms of manpower and financial resource-allocation, it was perceived the right fit to study organizational resilience and how management systems impact it.

5.3 Discussion of findings

The research had two main questions stemming from the research objectives and three additional ones exploring relevant propositions from the literature. In this section, findings are synthesized to answer these questions, interpret the findings and relate findings to the reviewed literature. Discussion is organized by research questions.

Question 1: To what extent does the implementation of ISO 9001 quality management principles affect resourcefulness?

The findings showed that ISO implementation had an important impact on resourcefulness within the context. The standard highly enhanced communication, sharing of information, employee engagement, process-orientation, visibility and adaptability. As a result, organizational learning and fact-based decision-making were promoted. Besides, the standard introduced risk assessment and management practices, which improved the organization's ability to self-organize, and enhanced creativity, innovation and vigilance. Most importantly, the standard had an important positive effect on the overall organizational capacity to deal with difficulties. Hence, the research

concluded that ISO implementation did strongly promote resourcefulness, therefore, resilience in the context of this research. In Soeters' (2000) words, the standard transformed the organization from a 'cold' to a 'warm' one, where it has become critical toward risk. However, this needs to consider the answer to the second question (see discussion of question 2), since these are closely related. Also, an organization might be able to produce similar effects via other means (e.g. leadership style).

By improving the flow of communication, employee engagement and visibility, and embracing fact-based decision-making and organizational learning, the standard enhanced the organizational capacity to deal with difficulties. The culture of open communication and engagement, which was further emphasized by ISO implementation broadened employees' understanding of work within their units and enhanced multidisciplinarity. Besides, the same culture enabled employees and management to observe any deviation via performance indicators. Based on the nature and scale of difficulty, it was either addressed or communicated to top management for decision-making. The semi-horizontality in the organizational structure, resulting from ISO implementation, supported fast intervention via accelerated communication flow and decision-making. Although semi-horizontality can be achieved via other approaches, the evidence showed it resulted from ISO implementation in this case. Similarly, the increased dependence on facts greatly improved visibility within the organization, which in turn disclosed issues and enabled faster location of root causes. For example, based on deployed indicators, a section could locate the slowest activity/employee and propose solutions (e.g. new recruitment) to speed the process. Finally, with self-organization, among other risk management techniques, alternative approaches were utilised when needed to ensure continuity of operation. Thus, the organization became more adaptable and resilient. These outcomes must be considered with care as Chapter 4 showed some inconsistency in both the organizational structure and ISO implementation. The impact of ISO should not be over- or under-estimated since other factors contribute (see discussion of question 2).

The results and findings of the research align with a great deal of the reviewed literature on ISO either on the macro or micro levels. The findings support Rujan and Alic's (2010) findings that the standard reduces routine-orientation and introduces innovation within the implementing environment. As discussed earlier, ISO implementation further enhanced process-orientation in DG1 and introduced semi process-orientation in some parts of DG2. It also encouraged non-conventional thinking to overcome difficulty, which aimed at avoiding cases of non-conformance. However, this is relative based on the implementing environment, which has a great influence. Abdul Samat et al. (2012), ISO (2012) and BAB (2015) affirm the central role of employee engagement in ISO, which according to BAB triggers innovation. These together freed employees from routine-thinking and improved adaptability. This also aligns with Zelnik et al. (2012) who suggest that ISO implementation paves the way for further radical improvement. For instance, self-organization techniques that resulted from ISO operations had improved resilience tremendously. This in turn supports both Abbott (1999) and Bonila's (2015) propositions on the importance of having flexible and rich systems to overcome difficulties. The findings also provide support to many of the propositions made by the early pioneers of the quality movement. For example, the findings emphasize the role of communication, employee engagement, teamwork, cross-functionality, facts, continuous improvement and process thinking for organizational resilience which ISO implementation further enhanced. These were perceived essential for adaptability by, inter alia, Deming (Deming, 2013), Juran (De Feo & Juran, 2012), Crosby (Crosby, 1979), Feigenbaum (Feigenbaum, 1983) and Ishikawa (Watson, 2004; Goetsch and Davis, 2014).

The findings further stress the role of leadership in setting direction, providing an enabling environment and involving people. This lines up with ISO (2012) and BAB (2015) which advise that by engaging people, leadership can realize better results. The difference between DG1 and DG2 set an example of two different environments, one with clear direction and involvement of employees, while the other seemed to lack such an aim in terms of the quality

system. These also are aligned with the Australian Government's (2011) conclusions that leadership engagement, beside clarity of roles and open communication, is essential for resilience. The findings show that the process approach had positively impacted resilience by improving clarity of role, measuring capability and evaluating risk. It also ensured consistency across the organization through enhanced sharing of information. This aligns well with ISO (2012) and BAB (2015) which explained that ISO produces better results via organizing the work environment in terms of information flow, roles and work procedures. Moreover, the findings support BAB's (2015) claim that continuous improvement enhances flexibility and adaptation as the organization had issued the fourth edition of some processes and restructured the organizational structure to overcome difficulties and eradicate issues. This also backs ISO's (2012) proposal that system-thinking leads to improvement in both efficiency and effectiveness. As explained earlier (see Chapter 4), the organization was able to reduce cost and establish alternative methods to realise its goals under the financial difficulty through a collective effort across the whole system. However, change should be not seen as an end in itself, rather it should focus on achieving organizational goals (e.g. enhanced effectiveness or efficiency). Otherwise, having changes for no reason may result in negative outcomes (e.g. resistance to change). The findings on organizational learning's important role in achieving resilience align with previous research by Lengnick-Hall (2011), Valikangas (2012), Pal et al. (2014) and Cole (2015) who emphasise the role of knowledge, knowledge management and learning for resilience.

Beside supporting previous work, the research introduced some novel findings. First, it empirically showed that the ISO 9001 quality management system had a positive effect on resourcefulness, and therefore resilience. That was achieved through a number of direct and indirect interactions among organizational actors and systems. Although previous research did address some aspects like communication, engagement and empowerment in relation to ISO, these were studied apart from the organizational capacity to deal with difficulty, which has gained increased importance over time. Second, the

findings revealed that though first order interactions may not result in an effect on resilience, higher order interactions can have a profound impact. For example, the improved flow of communication brought by ISO led to enhanced sharing of information, which in turn promoted visibility. This visibility played a key role in predicting and overcoming issues. Similarly, the documentation required by the standard produced a wealth of knowledge that improved organizational learning, which in turn enhanced resilience. Another aspect had to do with emotions of fear and keenness. The standardization introduced by ISO requires audits to check for conformance. Fear and keenness drove people to avoid such instances by innovation. Third, the findings indicated that ISO can contribute to better resilience under semi-process- or process-orientation. This finding is unique and important as it shows that under certain circumstances both the Audit Society and High Reliability can coexist, interact and enhance each other. This can change the way standardization is perceived from the high reliability perspective and vice versa.

Question 2: How does process-orientation affect the relationship between the implementation of ISO 9001 principles and level of resourcefulness?

The findings demonstrated that the organizational structure played a decisive role when it came to both the implementation of ISO and level of resourcefulness. The standard produced far better results under process-orientation, while it appeared awfully inconsistent under routine-orientation. Similarly, process-orientation had contributed to better resourcefulness, in comparison to routine orientation. This in turn resulted in enhanced resilience in process-oriented units. Process-orientation had, in some cases, led to results that exceeded both the requirements and practices of ISO in relation to resilience. Hence, the research concluded that the organizational structure had the most significant role by moderating the relationship between ISO and resourcefulness, and at the same time by directly enhancing resourcefulness through process-orientation.

The findings demonstrated a major role for ISO implementation and even a more impactful role for the organizational structure when it came to resourcefulness. The nature of the organizational structure, whether it was routine- or process-oriented, determined the extent to which ISO implementation was to be successful or not. The standard worked well under horizontal (process-orientated) and semi-horizontal structures, where it was perceived as a work enhancement method. On the contrary, under routine environments, the standard produced inconsistent results and was perceived as an extra work, a burdensome procedure. This did apply to the role of ISO when it came to resourcefulness as communication, sharing of information and engagement were severely undermined under routine-orientation. Besides its role as a moderator between ISO and resourcefulness, the organizational structure had a direct impact on resourcefulness. The units exhibiting process-orientation appeared to be far more resourceful when compared to routine-oriented units. In fact, the units with the most process-oriented organizational structure performed beyond the ISO level at some points, as their own requirements were more demanding. However, the interaction between the organizational structure and ISO was found to be very complex and perhaps worthy of a fuller study on its own, especially in terms of employees' attitudes and change management. It seems these two aspects play an important role, but these remain out of the scope of this research.

In relation to the reviewed literature, the findings provide some support to previous research at the micro level of the concept. For example, the findings back Cyert and March's (1992) conclusion that routine-orientation creates commitment to rules and simplifies work. This was evident in the case of DG2 where most of the work consisted of simple procedures. The findings also showed that under proceduralization people tend to be more change- and uncertainty-averse, which align with Nelson and Winter (1983) and Cyert and March (1992). This was noticed in DG2 which suffered from resistance to the changes ISO introduced, especially among older and long serving employees. Similarly, the findings provide support to Nelson and Winter (1983) and Hammer and Champy's (1993) suggestion that routine-orientation inhibits

organizations' flexibility and responsiveness, which in turn limits resilience. Again, DG2 had less capability to overcome difficulty, resulting in days of no work as explained in previous chapters (see Chapter 4). Yet less capability does not mean incapability, since techniques like self-organization were still noted, though, less frequently when compared to DG1.

The findings relate to the literature on process-orientation as well. They back Hammer (1990), Davenport and Short (1990) and De Feo (2017) who hint that process-orientation makes the organization more open to change. This was evident in the case of DG1 where ISO was more accepted and better practised. The findings showed that Process-orientation enhanced multidisciplinarity, and education and learning aligning with the propositions of Hammer and Champy (1993). Finally, the results agree with a stream of literature including Hammer and Champy (1993), Davenport and Nohria (1994), Forsberg et al. (1999), Hertz et al. (2001), Ongaro (2004), Peter and Klaus (2007), Vera and Kuntz (2007), Skrinjar et al. (2008) and Kohlbacher and Reijers (2013) that demonstrated improved performance due to process-orientation. Most importantly, it supports Silvestro and Westley (2002) who revealed that process-orientation improves responsiveness; therefore, resilience.

Beside supporting many of the previous assumptions about the role of the organizational structure in relation to change and flexibility, the findings of the research demonstrated the moderating role of the organizational structure between ISO management system and resourcefulness. It showed how process-orientation is a prerequisite to achieve resilience by applying quality management practices. Also, the findings recognized a distinctive role of the organizational structure, which when mature enough directly enhances resilience apart from other management systems. The findings align with the results of a recent study by Dutt and Joseph (2016) who demonstrated the instrumental role of the organizational structure in relation to uncertainty. They too found, inter alia, that process-orientation enhances resilience. Though process-orientation does support resilience, factors like, leadership,

management and strategic direction, which lie outside the scope of this research, still play key roles.

Questions 3: Is there evidence that self-organization generates better ability to respond to challenges within the context of this research?

One of the main findings of the research was the role of self-organization in resilience. Self-organization seemed to be the main way to overcome any challenge within the context. Further emphasized by ISO, self-organization proved to be vital to overcome tight-coupling in many of the units, since the interconnectedness could not be disentangled due to the nature of work and legal constraints. Hence, the research concluded that self-organization vastly improved the ability to overcome difficulties.

Although having alternative approaches to continue operation was considered by some units before the implementation of the ISO standard, these were individual efforts. With the standard, it became compulsory to plan, set and document two to three independent approaches to perform every activity. Similarly, each employee had two to three replacements, colleagues who assumed his/her role in case it was needed. This proved vital as it tremendously enhanced the organization's ability to deal with difficulties as both technology and manpower issues were manageable at the unit level. The finding strongly supports the assumption of the Global Risks Report (2013) showing that self-organization enhances resilience. Furthermore, the findings revealed an important role for self-organization in terms of overcoming internal complexity like tight-coupling between units during normal operation. For organizations with limited resources, simple self-organization methods can replace other costly systems (e.g. complicated IT systems). Yet, it does not have to be thought of as only an ISO by-product.

Question 4: Is there evidence that entrepreneurial spirit develops capability for survival within the context of this research?

The findings showed that entrepreneurial spirit had somewhat improved the capacity to deal with difficulties in the organization. The main roles here were

overcoming resistance and providing resources, especially, external financial resources. However, due to the limited evidence, the research concluded that entrepreneurial spirit partially enhanced resilience. The reason behind the lack of evidence could be attributed to the absence of a culture that promoted entrepreneurial spirit within the organization. Those were individual efforts based on personal initiatives, though, the organization seemed on its way toward creating such a culture. It is necessary to look at the bigger picture and consider the overall work environment. With more emphasis on entrepreneurship, an organization can realize more benefits.

Driven by limited resources, some individuals looked for external sources to close the gap. This included, inter alia, financing training courses, publications and other events. Similarly, others took upon their own shoulders solving departmental issues like resistance to change and communication problems. These did indeed play an important role; however, due to the size of the organization and required resources, entrepreneurial spirit was found to have a marginal effect. However, this must not underestimate its role as it worked to a great extent for some units. This in turn provides partial support to Baron (1998) and Thornberry (2006) who suggest that entrepreneurial spirit improves resilience.

Question 5: Is there evidence that mindful organizations are more open to change within the context of this research?

The study provided evidence on the important role of mindfulness. It enhanced the detection of any problem, added a long-term view and provided employees with new perspectives toward issues. This fact-based approach made people more tolerant to change, as they better understood its grounds. Thus, the research concluded that mindfulness enhanced openness to change. An important benefit of mindfulness was the improved system approach as people had a better view of the whole process across the organization.

As ISO emphasized both facts and visibility, people became more aware of their own environment, including difficulties and gains observed by other units. Hence, units sought to avoid the difficulties and realize the gains. Similarly,

with set deadlines in accordance to the ISO procedure, people needed to ensure work was delivered on time. This required vigilance to anticipate any issues and introduce change if needed to avoid any non-conformance to the ISO requirements. Hence, the findings support Gartner's (2011) proposition, pointing to the important role of mindfulness in change.

5.4 Research contributions

The research contributes to the literature on organizational resilience at the strategic and operational levels by empirically investigating how resourcefulness behaves in a setting marked by the implementation of quality management practices, in particular the ISO 9001 standard. It addresses the concept of resilience from a holistic view, not just in relation to scope within the environment but also in relation to other management systems and practices. This is a distinctive feature for this research as it goes beyond assessing first order effects. It shows how different quality management principles and practices act and interact in relation to resilience. For example, it highlights the role of ISO documentation in creating a learning organization that in turn enhances resilience capabilities. Similarly, data generated from ISO-related operations enable quick detection and location of problems. Added to that, the research synthesizes and expands previous theoretical work (e.g. Abbott, 1999; Tierney and Bruneau, 2007; Wicker et al., 2013) on resourcefulness. The body of literature on resourcefulness consisted of multiple scattered pieces which did not comprehensively define the concept in terms of processes and characteristics. Hence, the research greatly contributes to the ongoing efforts toward the operationalization of the concept of resilience. This is achieved by determining and defining the main relevant processes and attributes. Similarly, it contributes to the body of knowledge by understanding the specific role each element of resourcefulness plays and how these elements are affected by specific quality management principles. The research also contributes by introducing a fresh sight toward auditing and high reliability, which have been for long seen as two non-coexisting streams

of theory and practice. It does so by showing how both auditing and high reliability can coincide when certain circumstances do exist.

The research contributes to the literature on strategic management and organizational structure by showing how organizational structures moderate the relationship between quality management principles, in this case ISO 9001 principles, and resourcefulness. The research provides empirical evidence on how both routine-based and process-based structures influence the impact of the standard on resourcefulness. By demonstrating the vital role of process-orientation in enhancing resilience, the research exhibits how high reliability can result from and coexist with auditing. This should lead to better understanding of the interaction between the different studied variables within a given organizational structure. Hence, it contributes to the body of knowledge on strategy by establishing strategic relationships between variables from quality management, resilience and organizational structure. Moreover, the study highlights the role of leadership in relation to the implementation of quality management initiatives, which in turn impacts resource management, risk management and resilience.

The research makes additional contributions to the broader body of knowledge on management. First, it contributes to the literature on self-organization by empirically studying how capability to self-organize impacts resourcefulness during difficult times. By better understanding the role of self-organization both during normal and difficult times, the study shows the strategic and operational importance of the concept. It supports the system to overcome structural shortcomings during normal operation, whilst improving resilience during difficulties. Similarly, the study contributes to the literature in the field of entrepreneurship by focusing on the teleological nature of the concept, ‘what entrepreneurial action leads to’ (Mitchell et al., 2012), (Thornberry, 2006). The study investigates how entrepreneurial spirit contributes to resourcefulness and provides partial evidence in support of that. Also, the study contributes to the body of literature on mindfulness (e.g. Gartner, 2011) by empirically investigating the role it plays during normal and

difficult times. Mindfulness supports transformation by creating openness to change, which in turn benefits the organization during normal and difficult times.

Other contributions include the choice of methodology and context. By devising an insider-outsider approach, the study introduces an uncommon perspective on the study of resilience. The presence of a local informer provides a more trusted and inclusive analysis that ensures balanced conclusions are drawn. Added to that, the approach enabled further examination and linking inputs from the different levels of the organization. Thus, it constituted an overall better analysis and interpretation process. The context of the research is another distinctive feature. Studying resilience in a public educational context is a unique contribution, especially, with the increased attention devoted to the topic by international organizations like UNESCO (Fredriksen, 2015) following many humanitarian crises around the world.

In addition to theoretical contributions, the study seeks to contribute to policy by integrating resilience in both the strategic planning and operation of quality management. As a result, the study may contribute to revising policy in relation to organizational structure, quality management and risk management. It also seeks to contribute to practice by helping managers understand how quality management initiatives affect organizations' capability to encounter challenges. This means quality-related decisions should be considered in a holistic approach balancing their impact on organizational structure and resilience. At the same time, this work aspires to help practitioners better understand resilience (resourcefulness) as a practice by introducing it as a set of processes and attributes.

5.5 Research implications

The research findings have a number of implications for theory and practice. First, at the theoretical level, the findings further emphasize a holistic approach toward organizational resilience, while at the same time push toward

the study of micro level processes and sub-processes of the concept. This should enable better understanding of resilience and facilitate operationalizing the concept. Furthermore, the findings demonstrate the nature of organizational resilience and how it results not only from main or first order effects, rather it involves interactions to be considered. This should have implications to the theory on the strategic deployment of management systems as attention needs to be equally paid to both macro and micro level processes of resilience. Also, the findings should serve as good grounds toward conceptualizing a resilience-based management system (e.g. quality management system) as they have identified some main relevant concepts, practices, effects and interactions. At the same time, the findings urge paying due attention to the organizational structure both for the implementation of management systems and achieving organizational resilience. This will enable better theorizing and conceptualization of resilient systems.

Second, in relation to policy, the findings establish how management systems and practices (e.g. auditing practices) relate to organizational resilience. This should guide an informed integration of such practices into policy with the aim of enhancing resilience. This can involve, for example, setting guidelines to deliberately guide auditing toward encouraging innovation and entrepreneurship. At the same time, the findings have practical implications for the implementation of management systems by considering the impact of such systems on the capability to overcome difficulties. This means that the traditional perspective on quality management systems, for example, needs to be revised. As both management systems and resilience in many situations deal with resource scarcity, a one package (integrated) approach will get more importance with time, for one without the other does not suffice. The findings demonstrate how a management system, ISO 9001, can be further enhanced to ensure both quality and resilience, which reduces both cost and effort at the organizational level. The findings have practical implications to leadership as they highlight the importance of both the work environment and organizational structure. Leadership should revise practices and encourage those instrumental for a resilient organization. This can even include the reward and

incentive system. Similarly, middle management needs to steer daily operations in accordance with practices that ensure both compliance and resilience. Practices like self-organization and vigilance should be considered and further enhanced.

5.6 Future research

Like any research work, this study has limitations. Hopefully, by pointing to these limitations, future research will be able to address them.

First, the sampling procedure is considered the main limitation. During the fieldwork, every department and sub-unit (section) in the studied DGs were invited to participate in the study. Units were handed copies of information sheets, research questions and consent forms aiming at familiarizing them with the topic and ensuring they are comfortable with it. Added to that, each DG issued an electronic memorandum highlighting the importance of the study and urging employees to take part in it. A total of 32 interviews were held; however, when considering stratification factors, a few departments were under-presented with only 2 people. Thus, these departments were excluded from department-level analysis, while considered during DG-level analysis. This has implications on the representativeness of the sample. It should be paid due attention and carefully considered in future works.

Second, another issue was the methodology choice, which resulted into a representation issue. Females represented only one quarter of the total number of participants. This was an anticipated issue when deciding on the research methodology. Potential remedies were proposed and implemented, including, ensuring participants that voice recording was optional, people being interviewed in their own environment and allowing utmost flexibility in timing. Though, these measures encouraged more female participation, surprisingly, they led to even more male representation. This biased the representation of the sample. It needs to be further considered and other approaches like focus groups might help in similar contexts, though, some people may find this constraining to speak freely.

Third, longitudinal effects are considered another limitation. Though, the research study started with the aim of studying the impact of the ISO 9001:2008 standard on resilience, data collection coincided with the implementation of the 2015 version of the standard. This was a great opportunity to understand how the new version had impacted; however, time limitation made it difficult as implementation was at its early stage. The context analysis conducted before data collection failed to identify the transformation taking place as it was rolled out subsequently. This undermines the results related to the newer version. Data collection should anticipate and consider any transformations in the context of research in terms of both time and timing.

Fourth, the scarcity of research on resilience in relation to quality management practices makes it difficult to relate the findings to extant literature. Furthermore, the lack of research on resourcefulness in general and in particular in relation to management systems cast the same difficulty. Hence, a follow-up study, perhaps quantitative in nature, might be complementary to provide further empirical evidence. Though, this was out of the scope of this study due to time and resource constraints, it might be the best next step toward expanding the understanding of resilience and establishing resilience-based quality management systems. Finally, generalization of findings and implications should be dealt with care, considering all the above-mentioned limitations and the research context.

Success for this study will not be only in answering the research questions, rather it lies in triggering new research queries. Based on the literature review, methodology and findings, this study suggests some possible future work that could be carried out. First, a wide-scale quantitative study would be worthy of exploring the issues currently raised. Studying resilience under the implementation of quality management systems across multiple entities can yield further findings. The same applies to context, whether it be industry or geography. Added to that, studying resilience under different management or quality management systems (e.g. TQM, excellence frameworks…etc.) could provide useful insight which would expand the findings. Second, this research

focused on resourcefulness, a component of organizational resilience; more focus should be directed toward the other components of resilience (e.g. robustness, response…etc). By understanding the different components of resilience at the micro level, more insight can be gained on the mechanisms of the concept at the macro level. This will enable creating a holistic approach to resilience.

Third, as emphasized throughout the study, a resilience-based (quality) management system is perceived the distant goal. Hence, more research needs to take place to both establish and test such frameworks or models. Such a system can be based on quality assurance, business excellence or other management systems or it can be a hybrid that results from comparative studies. Fourth, more attention needs to be paid to the role organizational structures play in resilience. Though, the study demonstrates how process-orientation enhances resilience, aspects like leadership/management styles need to be considered. Similarly, employees' attitude and participation in the very early stages of implementation should be considered. This may reflect a new perspective toward the role of organizational structure. Finally, change management seems to play an important role in relation to both adopting quality management systems and enhancing resilience. Since both require change in mindsets, change management needs to be considered and perhaps integrated in future studies.

5.7 Concluding remarks

As Darwin once said: "it's not the strongest species that survive, nor the most intelligent, but the most responsive to change". This research quest was initiated to explore the intersect between three fields of management: quality management, organizational resilience and organizational structure. With the aim of expanding understanding on how quality practices impact resilience and the role of organizational structure in this intersect, the study embarked on an extensive review of literature, a thorough design of methodology and a rigorous analysis process. These introduced new findings, briefly restated in this final chapter, that hopefully will lay new grounds for further research.

This mindful quest for knowledge, evidence and outcome transformed the researcher philosophically, theoretically, practically and in terms of interest. Though, this work might be a one-time experience for many directly involved with it, it will form a life experience for the researcher as the one thing new knowledge acquisition does well is to show people how ignorant they still are. It will set future directions, opportunities and most importantly future research in a journey started with passion and ended with renovated passion and enthusiasm.

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Appendix A

Interview questions:

Objective	*Familiarize the participant to the research.*
Research question	*How has ISO 9001 implementation affected overall performance?*
Interview questions	1. Describe your own experience with the implementation of ISO 9001 in your organization. 2. How do you think ISO 9001 has affected overall performance within your organization?

Objective	*Investigate the effect of process-orientation level on the relationship between quality management principles and resourcefulness*
Research question	*How does process-orientation affect the relationship between the implementation of ISO 9001 principles and level of resourcefulness?*
Interview questions	3. Describe communication flow between employees (whether vertically or horizontally) within your working environment. 4. Describe employee engagement (in planning and decision-making) in your organization. 5. Describe employee empowerment (ability to make decisions) in your organization. 6. How are activities performed in your organization? Describe your own activity-performance. 7. How does the organizational structure perceive multidisciplinarity? 8. How does the organizational structure perceive cross-functionality? 9. Describe to what extent your organization utilizes expertise. 10. How does the structure impact the organization's ability to change? 11. How does leadership/top management perceive the current situation of the organizational structure?

Objective	1. *Identify the impact of the implementation of ISO 9001 quality management principles on resourcefulness in the public sector;* 2. *Test literature-related claims within context of the research.*
Research question	1. *To what extent does the implementation of ISO 9001 Quality Management Principles affect Resourcefulness in MoE?* 2. *Is there evidence that self-organization generates better ability to respond to challenges within context of the research?* 3. *Is there evidence that entrepreneurial spirit develops capability for survival within context of the research?* 4. *Is it true that mindful organizations are more open to change within context of the research?*
Interview questions	Problem identification & Hazard prioritization: 12. How does your organization approach potential problems? Resource mobilization: 13. How does your organization mobilize resources required to achieve set goals? Organizational learning: 14. How do experiences impact operation within your organization? Sensemaking: 15. When dealing with issues of concern, describe how your organization approach them. Self-organization: 16. When faced by challenges, describe how your organization and its units respond. Creativity and innovation: 17. Describe the scope you have for creativity and innovation within your working environment. Entrepreneurial spirit: 18. Describe entrepreneurial spirit within your organization. Mindfulness: 19. Describe vigilance to lived experiences in your organization. Loose-coupling: 20. How do departments work together? Resourcefulness:

	21. In general, describe how has ISO 9001 implementation affected your organization's ability to adapt to crisis/difficult situations.

Appendix B

Information sheet:

THE UNIVERSITY of EDINBURGH

Information Sheet

Research project title: Organizational Resilience through Quality Management: A Study on the Impact of the Implementation of Quality Management Principles on Resourcefulness.

Research investigator: Mohammed Al Balushi

Address & contact details:

Email:

Mobile:

About the Project

This research aims to investigate the relationship between quality management and organizational resilience. It examines the impact ISO 9001 implementation has on resourcefulness in public organizations. It also examines how organizational structure affects the relationship between ISO 9001 implementation and resourcefulness. The paper seeks to provide empirical evidence on the proposed relationships.

Who is responsible for the data collected in this study?

ورقة المعلومات

عنوان مشروع البحث: تحقيق المرونة المؤسسية من خلال إدارة الجودة: دراسة حول تأثير تطبيق مبادئ الجودة على قدرة المؤسسة على مواجهة التحديات.

اسم الباحث: محمد البلوشي

العنوان وتفاصيل الاتصال:

البريد الإلكتروني:

رقم الهاتف المتنقل:

حول المشروع البحثي:

يهدف هذا المشروع البحثي إلى دراسة العلاقة بين إدارة الجودة والمرونة المؤسسية (قدرة المؤسسة على مواجهة الصعوبات). يدرس البحث تأثير تطبيق معيار الآيزو 9001 على قدرة المؤسسة على التكيف مع الصعوبات المحيطة. كما يدرس البحث تأثير الهيكل التنظيمي القائم في المؤسسة على العلاقة بين معيار الآيزو 9001 والقدرة على التكيف مع الصعوبات المحيطة. تسعى هذه الورقة البحثية إلى تقديم أدلة عملية حول العلاقات المشار إليها أعلاه.

من المسؤول عن البيانات التي يتم جمعها في هذه الدراسة؟

ينفذ محمد البلوشي، باحث الدكتوراه في جامعة أدنبره، هذا المشروع البحثي كجزء من متطلبات برنامج الدكتوراه. يتم

Mohammed Al Balushi, a PhD researcher at The University of Edinburgh is undertaking this research project as part of his PhD programme requirements. Mohammed's study is fully funded by the Oman Ministry of Higher Education to contribute to the Oman Ministry of Education's efforts toward improving the national education system. Beside him, his academic supervisors (Dr. Ian Graham and Prof. Jack Ansell) are playing an integral part in this research, providing guidance and support.

The researcher seeks to collect qualitative data in relation to the impact a quality management system has on resourcefulness. Interviews are deployed for field data collection. Recordings of interviews will be safely stored encrypted on a secured computer, before copying them to the university's highly secured database. The recordings will be kept till the end of the research project, when they will be permanently deleted.

Based on the ethical guidelines of The University of Edinburgh, the interview recordings will not be shared with anyone other than those directly involved in the research project, when required only. No other organization can share the recordings, not even the studied organization. The research is ethically approved by the university ethics board.

تمويل دراسة الدكتوراه هذه بالكامل من قبل وزارة التعليم العالي بالسلطنة (ضمن البرنامج الوطني لبعثات الدراسات العليا) للمساهمة في جهود وزارة التربية والتعليم العمانية نحو تحسين نظام التعليم الوطني. كما يلعب المشرفين الأكاديميين على هذه الرسالة (الدكتور. إيان جراهام و البروفيسور جيك آنسل) دوراً محورياً في هذا البحث من خلال تقديم التوجيه والدعم الضروري.

يسعى الباحث إلى جمع بيانات نوعية تتعلق بتأثير نظام إدارة الجودة على قدرة المؤسسة على التكيف مع الصعوبات المحيطة، باستخدام المقابلات شبه المنظمة لجمع البيانات الميدانية. سيتم تخزين تسجيلات المقابلات بشكل آمن ومشفر على جهاز حاسب آلي مؤمن، قبل نسخها إلى قاعدة بيانات الجامعة التي تتمتع بمستويات أمان عالية للغاية. سيتم حفظ التسجيلات في قاعدة البيانات حتى نهاية المشروع البحثي، على أن يتم حذفها بشكل نهائي وقتها.

واستنادا إلى المبادئ الأخلاقية التوجيهية لجامعة أدنبرة، يمكن للقائمين المباشرين على المشروع البحثي الاطلاع على التسجيلات الصوتية، عند الضرورة فقط. لا يمكن لأي جهة أخرى الاطلاع على هذه التسجيلات، بما فيها المؤسسة موضوع الدراسة. علماً بأن هذا المشروع تم اعتماده من قبل مجلس أخلاقيات البحوث بجامعة أدنبرة.

ماذا تتضمن هذه الدراسة؟

خلال المقابلات شبه المنظمة، سيطرح الباحث على المشاركين أسئلة تصب الإجابات عليها نحو الوصول إلى إجابات على أسئلة البحث الرئيسية. بعد المقابلة (أو كلما رأى المشارك ذلك ضرورياً)، تتم دعوة المشاركين لتقديم ملاحظاتهم حول مواضيع البحث أو إجراءات المقابلة. ستستخدم هذه المدخلات القيمة لتحسين سير المشروع البحثي بشكل عام.

What is involved in the study?

During the semi-structured interviews, questions will be asked to collect responses that feed toward answering the research questions. Following the interview (or whenever the participant perceives necessary), participants are invited to provide feedback about the research or interview procedures. These valuable inputs will be used to improve the overall research process.

After transcribing the interview, participants will be provided with transcripts to review and comment. Their remarks will be considered, incorporated and sent back to them for final verification. This should take around a month after conducting the real interview.

What are the risks involved in this study?

We don't anticipate that there are any risks associated with your participation, but you have the right to stop the interview or withdraw from the research at any time.

What are the benefits for taking part in this study?

Taking part in this research study provides three main benefits: 1) overall, it is a contribution to human knowledge, 2) it targets fulfilling a national need as quality is a major issue in any education system, 3) and it expands understanding of the issues under study, including at employee level. Hence, as participants are perceived partners, their contribution to both human

بعد كتابة نص المقابلة، سيتم تزويد المشاركين بالنص للمراجعة والتعليق. وسيتم النظر في ملاحظاتهم وإجراء التعديل اللازم وإرسالها إليهم مرةً لأخرى للتحقق النهائي. من المتوقع أن يستغرق ذلك حوالي الشهر من تاريخ المقابلة الفعلية.

ما هي المخاطر المرتبطة بهذا العمل البحثي؟

لا يُتَوقع أن تكون هناك أي مخاطر مرتبطة بالمشاركة في هذا العمل البحثي، ولكن لدى المشاركين كامل الحق في إيقاف المقابلة أو الانسحاب من البحث في أي وقت.

ما هي فوائد المشاركة في هذه الدراسة البحثية؟

المشاركة في هذه الدراسة البحثية توفر ثلاثة فوائد رئيسية: 1) بشكل عام، تمثل المشاركة مساهمةً للمعرفة البشرية، 2) تستهدف الدراسة الاستجابة لمتطلب وطني، كون الجودة قضية رئيسية في أي نظام تعليمي، 3)، توسع المشاركة فهم المشارك للقضايا المدروسة. ونظراً لاعتبار المشاركين شركاء في العمل المعرفي، فإن إسهاماتهم للمعرفة البشرية ونظام التعليم الوطني لا تقدر بثمن.

ما هي حقوقك كمشارك في هذا المشروع البحثي؟

تعتبر المشاركة في هذا المشروع عملاً تطوعياً، ويمكن للمرشحين رفض المشاركة أو الانسحاب في أي وقت.

هل سأحصل على أي دفعات أو مزايا نقدية نظير المشاركة؟

لا يتلقى المشاركون أي مقابل مادي نظير مشاركتهم. فلن يتم استخدام البيانات من قبل أي عضو من أعضاء فريق المشروع

knowledge and the national education system is invaluable.

What are your rights as a participant?

Taking part in the study is voluntary. You may choose not to take part or subsequently cease participation at any time.

Will I receive any payment or monetary benefits?

You will receive no payment for your participation. The data will not be used by any member of the project team for commercial purposes. Therefore, you should not expect any royalties or payments from the research project in the future.

For more information

This research has been reviewed and approved by the Edinburgh University Research Ethics Board. If you have any further questions or concerns about this study, please contact:

Mohammed Al Balushi

Mobile:

E-mail:

You can also contact the researcher's academic supervisor:

Dr. Ian Graham

The University of Edinburgh

Tel:

E-mail:

لأغراض تجارية. عليه، لن يتم تقديم أي عائدات أو دفعات للمشاركين من المشروع البحثي في المستقبل.

للمزيد من المعلومات:

تم استعراض هذا البحث والموافقة عليه من قبل مجلس أخلاقيات البحوث بجامعة أدنبرة. إن كانت لديكم أي أسئلة أو استفسارات أخرى حول هذه الدراسة، يرجى التواصل مع:

محمد البلوشي

الهاتف:

البريد الإلكتروني:

كما يمكنكم التواصل مع المشرف الأكاديمي للباحث:

إيان جراهام

جامعة أدنبرة

الهاتف:

البريد الإلكتروني:

Appendix C

Interview consent form:

THE UNIVERSITY *of* EDINBURGH

Interview Consent Form

Research project title: Organizational Resilience through Quality Management: A Study on the Impact of the Implementation of Quality Management Principles on Resourcefulness.

Research investigator: Mohammed Al Balushi

Research Participant's name:

The interview will take ( ). We don't anticipate that there are any risks associated with your participation, but you have the right to stop the interview or withdraw from the research at any time.

Thank you for agreeing to be interviewed as part of the above research project. Ethical procedures for academic research undertaken from UK institutions require that interviewees explicitly agree to being interviewed and how the information contained in their interview will be used. This consent form is necessary for us to ensure that you understand the purpose of your involvement and that you agree to the conditions of your participation. Would you therefore read the accompanying information

استمارة الموافقة على المشاركة في المقابلة البحثية

عنوان مشروع البحث: تحقيق المرونة المؤسسية من خلال إدارة الجودة: دراسة حول تأثير تطبيق مبادئ الجودة على قدرة المؤسسة على مواجهة التحديات.

اسم الباحث: محمد البلوشي

اسم المشارك/المشاركة في البحث:

من المتوقع أن تستغرق المقابلة ( ). لا يُتوقع أن تكون هناك أي مخاطر مرتبطة بالمشاركة في هذا العمل البحثي، ولكن لدى المشاركين كامل الحق في إيقاف المقابلة أو الانسحاب من البحث في أي وقت.

في البداية، أتقدم لكم بالشكر على الموافقة على إجراء هذه المقابلة والتي تمثل جزء من المشروع البحثي المذكور أعلاه. تتطلب الإجراءات الأخلاقية للبحوث الأكاديمية التي تجريها المؤسسات البريطانية وجود موافقة صريحة من المشاركين على إجراء المقابلات، بالإضافة على موافقتهم الصريحة على كيفية استخدام المعلومات التي سيتم جمعها خلال المقابلة. استمارة الموافقة هذه ضرورية لضمان فهمكم للغرض من مشاركتكم، وضمان الحصول على موافقتكم على شروط المشاركة. عليه، يرجى قراءة ورقة المعلومات المرفقة ثم التوقيع على نموذج الإقرار هذا، معبرين عن إقراركم على ما يلي:

- تسجيل المقابلة صوتياً ومن ثم إصدار نسخة مكتوبة منها؛
- إرسال نص المقابلة لكم لإعطائكم الفرصة لتصحيح أي معلومات خاطئة؛

sheet and then sign this form to certify that you approve the following:

• the interview will be recorded and a transcript will be produced;

• you will be sent the transcript and given the opportunity to correct any factual errors;

• the transcript of the interview will be analysed by (name of the researcher) as research investigator;

• access to the interview transcript will be limited to the researcher and academic colleagues and researchers with whom he might collaborate as part of the research process;

• any summary interview content, or direct quotations from the interview, that are made available through academic publication or other academic outlets will be anonymized so that you cannot be identified, and care will be taken to ensure that other information in the interview that could identify yourself is not revealed;

• the actual recording will be (kept or destroyed state what will happen);

• any variation of the conditions above will only occur with your further explicit approval.

By signing this form I agree that:

1. I am voluntarily taking part in this project. I understand that I don't have to take part, and I can stop the interview at any time;

2. The transcribed interview or extracts from it may be used as described above;

3. I have read the Information sheet;

4. I don't expect to receive any benefit or payment for my participation;

- سيقوم الباحث بتحليل نص المقابلة؛
- سيقتصر حق الاطلاع على نص المقابلة على الباحث والأكاديميين والباحثين الذين يتعاون معهم في عملية البحث؛
- ضمان إخفاء شخصيات المشاركين في حال إعداد موجز لمحتوى المقابلات أو أخذ اقتباسات مباشرة من المقابلات من أجل النشر الأكاديمي وغير الأكاديمي بمختلف أشكاله، بحيث لا يمكن تحديد هوية المشاركين، بالإضافة إلى التأكد من عدم الكشف عن المعلومات الأخرى التي يمكن أن تحدد هوية المشاركين؛
- سيتم التخلص من التسجيل الفعلي المشفر بطريقة آمنة مباشرة بعد الانتهاء من المشروع البحثي؛
- لا يمكن إجراء أي تغيير في الشروط المذكورة أعلاه إلا بموافقة المشاركين الصريحة.

من خلال التوقيع على هذا النموذج، أقر بما يلي:

1. المشاركة طوعاً في هذا المشروع، وأننا نعلم أننا لسنا مضطرين للمشاركة، وأنه يمكننا أن نوقف المقابلة في أي وقت؛
2. السماح باستخدام الاقتباسات أو المقتطفات من نص المقابلة على النحو المبين أعلاه؛
3. بأننا قرأنا ورقة المعلومات المتعلقة بالمشروع البحثي؛
4. أن مشاركتنا طوعية بلا أي مقابل مادي أو منفعة أخرى؛
5. من حقنا طلب نسخة من نص المقابلة والقيام بإجراء التعديلات التي نرى أنها ضرورية لضمان فعالية أي اتفاق يتعلق بالسرية؛
6. لقد تمكنا من طرح تساؤلاتنا، وأن لدينا كامل الحرية للاتصال بالباحث حول أي تساؤلات أخرى في المستقبل.

اسم المشارك:

توقيع المشارك: التاريخ:

توقيع الباحث: التاريخ:

5. I can request a copy of the transcript of my interview and may make edits I feel necessary to ensure the effectiveness of any agreement made about confidentiality;

6. I have been able to ask any questions I might have, and I understand that I am free to contact the researcher with any questions I may have in the future.

Participant's name:

Participant's signature: Date:

Researcher' signature: Date:

For more information

This research has been reviewed and approved by the Edinburgh University Research Ethics Board. If you have any further questions or concerns about this study, please contact:

Mohammed Al Balushi

Mobile:

E-mail:

You can also contact the researcher's academic supervisor:

Dr. Ian Graham

The University of Edinburgh

Tel:

E-mail:

بيانات الاتصال

تم استعراض هذا البحث والموافقة عليه من قبل مجلس أخلاقيات البحوث بجامعة أدنبرة. إن كانت لديكم أي أسئلة أو استفسارات أخرى حول هذه الدراسة، يرجى التواصل مع:

محمد البلوشي

الهاتف:

البريد الإلكتروني:

كما يمكنكم التواصل مع المشرف الأكاديمي للباحث:

إيان جراهام

جامعة أدنبرة

الهاتف:

البريد الإلكتروني:

Appendix D

The Role of Mutual Benefit in Informal Public Risk Management

By

Mohammed Al-Balushi and Jake Ansell

Informal risk management is widely practiced as it can be more agile and flexible compared to formal methods. There are abundant research studies covering areas such as technical and social aspects of informal risk management. Often a holistic approach is advocated integrating inputs coming from informal networks to consider, inter alia, social, cultural and emotional factors. These studies, though, fail to explore the motivation and do not take account of the role mutual benefit. Using ethnographic and interview data, we tackle the issue of how decision makers consider the interests of all relevant stakeholders, the role mutual benefit plays in informal risk management and impact of the formal structure has on informal risk management. The findings show that mutual benefit is an essential pillar for informal risk management by both stimulating the required response and balancing interests. Also, the formal structure impacts on the informal network through the influence and ranks it confers on members, and by setting consequential limits.

Keywords: mutual benefit, socio-technical networks, informal networks, risk management, informal risk management.

Introduction:

Some have criticized formal mechanisms for being overly proceduralized (Goddard et al., 1999; Hardy & Maguire, 2016), while others have called for a more holistic approach to corporate risk management (Wamsler & Lawson, 2011; Cervantes-Godoy, 2013; Hardy & Maguire, 2016). In a crisis, Perrow (1984) advocated expertise should be the dominant approach, removing formal structures. Besides crisis, risk management often succeeds by using often through using informal networks. It has been stressed by many researchers the importance of the informal networks play in risk management, see Hacking (1986;), Peng & Heath (1996), Peng (2003), Broadhurst et al. (2010), Andreeva et al. (2014), Fischbacher-Smith & Fischbacher-Smith (2014) and Dawson et al. (2015). Another group of scholars has pointed to trust (Hood (2010), Uslaner, 2002; Poortinga & Pidgeon, 2003), and social validation (Levine et al., 2000; Lee & Dry, 2006; Jansen et al., 2011) as important aspects for decision making within informal networks. Indeed, the literature on both informal networks and risk management have engaged in a large number of conversations regarding risk eradication or minimization going much beyond the references already given.

An aspect less often studied is the role of 'mutual benefit' in informal networks for managing risk. Whether it is about informal risk management techniques among poor households (Moser, 1996; Trarup, 2012) or established corporations (Broadhurst et al., 2010; Fischbacher-Smith & Fischbacher-Smith, 2014), why would people activate their network(s) to overcome risks? What motivates participating in these networks respond to this call for assistance? While trust and social verification are crucial in informal risk management, this paper gives the same importance to mutual benefit. Yet, this concept has not received the same volume of attention. Hence, this 'undervalued' aspect of informal risk management drives the current research presented in this paper.

This paper sheds light on the role of mutual benefit in informal risk management. It starts with a theoretical discussion on socio-technical networks to pave the way for a socio-technical perspective on risk management. Then it discusses informal risk management within different contexts of public environment (e.g. poor households and public

environments). Mutual benefit is as motivating factor within social exchange theory, where mutual benefit between actors improves the response to difficult conditions and may resolve risk management issues. It provides the base for understanding the role of mutual benefit in both the formation of informal networks and resource mobilization, which allows response to risk and adverse conditions.

Socio-technical networks:

Herrmann (2009) introduces socio-technical networks as the "phenomenon in which human/computer interaction and human communication are systematically integrated", which extends to human/systems interactions. Weinberger et al. (2002) show that socio-technical networks facilitate interchange and collaboration by promoting partnership and knowledge sharing. Nonaka & Takeuchi (1995) and Tammets et al. (2013) explain the criticality of knowledge flow for a system to function. Doolin (1999) highlights the role of networks in resolving organisational issues. Socio-technical networks exist as both formal and informal networks. Lincoln (1982) defines a formal network as "a highly idealized image of organizational reality" (Waldstrøm, 2001) with Simon (1976) explaining them as "a set of abstract, more or less permanent relations that govern the behaviour of each participant". The formal networks define the power relationship between members and the boundary of authority within the organisation according to Simon (1976), as it assigns the role of each member and the boundary of their action. On the other hand, Simon (1976) describes informal networks as the "interpersonal relations in the organization that affect decisions within it but either are omitted from the formal scheme or are not consistent with that scheme". Krackhardt & Hanson (1993) define informal networks, alternative hidden networks, as across an organisation that can "accomplish tasks fast". They are often composed of personal contacts such as friends or relatives.

Informal networks:

Nie et al. (2010), Ledeneva (2013) and Fischbacher-Smith & Fischbacher-Smith (2014) indicate that informal networks normally bypass ordinary organizational control

processes, and so the data flow cannot be captured by the organization. Cross et al. (2002) argue this can lead to less effective decisions. Tichy et al. (1979) give four examples of interactions that fall outside the formal structure of an organization: emotional exchange, power exchange, information exchange, and product and service exchange. Hence, it would be helpful for organizations to explore informal networks for a more holistic approach, if they can.

One can contrast the two networks with the informal network representing "the central nervous system" and the formal being the skeleton, see Krackhardt & Hanson (1993). As such, there is an interplay between informal networks and corporate culture which interchangeably determine the shape of the other, Groat (1997), and so the formal structures. Trarup (2012) suggests that informal networks reflect established social relationships, with bonding within an informal network and bridging to other informal networks. Morals play a significant role within informal networks as actions are not solely dependent on personal interests but also covers interests of other within the network, see Evers & Mehmet (1994) taking a Kantian view. Hence, reasoning plays an important mediating role between theoretical concepts and moral actions (Veblen, 1884). Trarup (2012) points to trust as a key factor within informal networks, described by Uslaner (2002) as 'particularized trust' within the network which allows joint goals, for example, both profit and risk minimization are sought by members.

Kratzer et al. (2008) points to the benefits of informal networks as being they are more active and stable than formal networks. Argyris (1957), Groat (1997) and Ledeneva (2013) debate the formation of informal networks. Ledeneva (2013) explains formation may be due overcoming the complexity of formal structures such as bureaucracy or to informally govern actions (e.g. resource allocation). Bernard (1938) felt informal systems are required to provide "communication, cohesion, and of protecting the integrity of the individual". Mizruchi & Davis (1999) demonstrate that relations within informal networks can shape organisational decision-making. Ghoshal & Bartlett (1990) and Hansen (1999) indicate that informal networks can enhance competitive advantage by transferring tacit knowledge. Levine et al. (2000) argue that informal networks highly

influence people's experience in search for information, problem solving and opportunity ceasing.

Groat (1997) and Cross et al. (2006) claim that a flourishing informal network ensures an organisation is more robust organization in dealing with difficulties, as Trarup (2012) illustrates with risk-sharing in informal networks amongst resource-poor Tanzanian being more resilient to hard times. In adverse conditions, Cross et al. (2006) suggest such networks provide better internal connectivity allowing spread of expertise enabling the capture of external resources to respond. Moser (1996) explains that poor households use restructuring as a risk-management strategy during crisis time. Similarly, Nie et al. (2010) claim that organizations with dynamic situations (e.g. restructuring) are more likely to utilize informal internal networks functioning. Gnyawali & Madhavan (2001) debate that when leadership realizes the role informal networks plays, then they would assist with building them to enhance relations that could ensure retaining best employees.

Informal risk management:

Beck (1992), Giddens (1999) (cited by Hardy & Maguire, 2016) and Lupton (1999) argue that risk management is mainly concerned with turning random and uncontainable risk into recognized and manageable risks. Mikes (2009) and Meacham & van Straalen (2017) highlight the issue of calculative risk management where the quantified risk value is the major component in risk decision-making. Such proceduralization in risk management, sometimes described as calculative risk (Mike, 2009), occurs where a specific approach is chosen and others discounted, constraining the possible scope of responses, which may produce less than ideal solutions, which might be harmful. Goddard et al. (1999) warn it will filter out the human wisdom provided by staff, adding in meteorology accurate risk prediction remains a challenge, even when aided by advanced technology.

Most common risk management approaches are built upon past experienced knowledge that makes dealing with uncertain conditions difficult, Hardy & Maguire (2016). They argue that using various sources to form risk knowledge builds a more complete image of the situation, allowing a more "meaningful and practical" adaptation and outcome. So

Broadhurst et al. (2010) indicates informal networks facilitate informal risk management, which play a crucial role in risk decision-making. Hence, integrating information from informal networks can provide a better outcome. Fischbacher-Smith & Fischbacher-Smith (2014) state that informal networks are important for the performance of an organization with a risk-potential mindset. They emphasise that informal networks are part of the risk portfolio of an organization. Broadhurst et al. (2010) emphasise the social dimension of risk-related decision-making and Hacking (1986) the central role of relationships and morality in risk management. Cervantes-Godoy (2013) points to informal networking as a risk management and coping strategy. Fischbacher-Smith & Fischbacher-Smith (2014) explain that within informal networks employees discuss deficiencies, shortcomings and limitations, and other information including early warnings of problems. They assume that warnings and signs of violation within a system are more likely to be found within informal flows of information. This includes the early signs of disasters that are communicated through unobserved hidden (informal) networks. Therefore, retrospective crisis analysis normally reveals the existence of warnings for the issue is about translating the informal knowledge to formal accepted actionable knowledge. Being in the area of 'observability', these signs are not caught prior to the situation.

Fischbacher-Smith & Fischbacher-Smith (2014) suggest that informal networks can allow for better access to knowledge and resources necessary to prevent escalations and reduce effects, while dealing with risks within a network setting represents a bigger challenge for both organizations and decision-makers. Peng & Heath (1996) and Peng (2003) suggest that firms adopt an informal network-based strategy when faced by uncertainty. This might be the case when no prior-set measures exist or when these measures fail. Andreeva et al. (2014) introduce a 'network based' approach to risk management where responsibility for public risk is shared between all stakeholders via 'knowledgeable supervision'. They argue that through responsibility-distribution and enhanced ownership-sharing among all stakeholders, risk management capabilities are improved.

Mutual benefit:

The motivation of exchange between individuals or originations relies in main part to mutual benefit, whether between ancient civilizations or in global trade. According to Hutton (1999), relationships involve active communication, mutual adaptation and dependence, common values, trust and obligation. Heath (2001) explains that within relationship management, communication is perceived as a tool to negotiate institution-public relations. Ledingham (2003) and Bruning et al. (2006) consider mutual benefit a crucial input in the relationship between establishments and people. An organization may wish to make 'profit' while the public seeks value in return. Teulade (1985) compares mutual benefit to cooperation clarifying that both are the direct result of need. This need can be communicated explicitly or implicitly, depending on whether any party is willing to compromise the power balance, if it exists. Littlejohn (1992) and Ledingham et al. (1999) clarify that mutual benefit is generated when the return is equal or exceeds expected reward. Teulade (1985) asserts that mutual benefit does not involve political or religious discrimination. The focus here is on the reward realized from the exchange. Sugden (2015) and Sugden (2018) emphasize on the 'intentional' aspect of mutual benefit within the market regardless of its explicitness or implicitness. In other words, before initiating such exchange, people are fully aware of the mutual benefit perspective. Ledingham (2003) and Bruning et al. (2006) point to mutual benefit as a source of strategic advantage when incorporated in public relations. According to Redmond (2015), "we choose from among relationships around us, those that provide the most reward or require the least cost". Hence, it is understood that mutual benefit does apply to individual and network level interactions, whether these are formal or informal communications.

As social exchange is embedded in social science (Dijkstr, 2015), mutual benefit can be explained under social exchange theory as there is an exchange of resources between actors/networks (Bruning et al., 2006). According to Thibaut & Kelley (1959), the social exchange theory states that relationships include the exchange of cost or reward with each party having expectation(s) from the other. Molm et al. (2001) says that "social exchange takes place only because actors value the benefits that others can provide". In case the

other party cannot provide the required reward or cost, the exchange might not occur. Molm et al. (2001) clarify that for a relationship to be developed and maintained, it needs to be accompanied by exchange of valuable resources among actors. Molm (1997) points that power in the social exchange theory stresses 'mutual dependence' that lies beneath social constructions. According to Molm (1997), dependence of actor(s) is the source of power for other actor(s). She also introduces reciprocal and negotiated exchange, where the later involves explicit negotiations over the exchange while the first does not. Fiske (1992) have identified four models for the evaluation of social exchange, namely, communal sharing, authority ranking, equality matching, and market pricing.

Case Study

Several authors support the concept that informal network are an important aspect of risk management [e.g. Foucault (1980); Hacking (1986); Moser (1996); Groat (1997); Narayan (1997); Adger (2003); Pelling & High (2005); Broadhurst et al. (2010); Trarup (2012); Gervantes-Godoy (2013); Fischbacher-Smith & Fischbacher-Smith (2014); Hardy & Maguire (2016)]. There is a lack of research on informal mechanisms deployed to deal with risks and obtain desired outcomes. In particular the role of mutual benefit in informal risk management has not been highlighted. This paper explores informal risk management addressing the role of mutual benefits within the process. A key feature is the requirement of taking account the interests of all the relevant stakeholders. Finally, it investigates how the formal organization impacts informal risk management.

The case of INO:

Mutual benefit plays a substantial role in informal risk management, especially in attempting to be successful and perhaps effective. This is illustrated in following case study on INO (name anonymized), an Omani public entity concerned with education headquartered in the capital Muscat. INO is a heavily network-based organization, with both local and international links. The nature of mutual benefit will be discussed as it is related to risk-encountering measures.

Data:

The analysis is data driven from two main sources: 1) personal observation by one of the authors, who has worked for INO since Aug 2013, and 2) 32 semi-structured interviews conducted within the organization between Jan and May 2018. The personal experience and observation of the author provides valuable insights on informal networks within the organizational environment. INO has direct and indirect connections with numerous local and international organizations, which enabled its members to establish connections with other external formal and informal networks as well as internally established networks.

The semi-structured interviews investigated risk management and resilience within the organization. Participants, selected based on purposive sampling, were invited to describe how risk is dealt with. The responses provided insights on formal and informal networks, and formal and informal mechanisms of risk management. This study took place over 3 years from 2013 to 2016, with a focus on how INO's informal networks are used to understand how decision-makers take into consideration the interests of all stakeholders, the role mutual benefit plays in informal risk management and the impact of formal governance on informal networks.

Informal networks in INO:

Development:

Observed interactions included two main strata of networks: internal and external networks. Internal networks refer to networks between members from the local INO community, while external networks extend to other communities beyond INO boundaries. It is notable that all informal networks within the context of INO serve a need, whether it is related to work (e.g. overcoming bureaucracy), social (e.g. talks), economic (e.g. access to financial resources) …etc. The collective networks of INO members tremendously expand the reach of the informal organization externally.

Informal networks exist due to the daily interaction between members. As a result of this frequent interaction, multi-layer networking has developed throughout the organization.

These start with department level networks and spread out toward other members or departments, ending with the organization-wide network. The main determinants of membership in these networks were found to be gender, years of service, friendship, status, hobbies and trust. Female members had their own cross-functional network. This was perceived the most powerful because of their external links with high-status people [mostly females], some of whom used to work in INO some years ago. Males may have their own networks, while some networks are mixed. Also, people with similar work experience within INO mostly networked together. This was notable in the case of people with +10 years of experience, who had great impact on the organization. Friendship between members, either after or before joining INO, was another main facet of network formation. People who had been friends even before joining INO had stronger networks. These were marked by an immense flow of information and resources, and preparedness to offer members immediate support. Status is another factor that connects people. Those perceived with status form their own networks (e.g. directors, advisors, etc.). Hobbies or interests seemed to be a source of networking, but these networks were the weakest and normally members had presence in other networks or sought support from other networks. Such networks continuously witnessed change in members.

Within these networks, hierarchy disappeared. The relationship was governed by respect, cooperation and trust. Trust, in particular, was essential for membership in all networks, except for hobby-based, as members showed more tolerance here. At the beginning, hobby-based networks normally did not include any conversations that required trust (e.g. criticism to colleagues or organization), however, they might have developed, but remained ineffective and not taken seriously. All these factors may individually or collectively develop networks. For example, gender and status combined in the case of high-status female networks. Another important network involved several male members who had been friends even before joining the organization. This network, in particular, had great influence on financial transactions and recruitment. They provided other members with crucial direction and support over such issues due to their powerful external links.

The above discussion addressed how networks formed based on personal interaction. Beyond the personal there were other reasons for formation. For INO, internal issues were dealt with within or between the existing networks. Similarly, these networks were activated to avoid monitoring mechanisms set by the formal organization. This does not suggest any corrupt behaviour, rather it is an attempt to surpass some of the routine procedures to speed up the process. These networks developed to enable resource mobilization across the organization to realize a common good. Interviewee 5 (I5) commented saying: *"look, as a principle, work must be delivered formally. However, some work is performed through informal channels to speed up the process"*. I17 summarized the scene saying: *"If we apply the formal procedures as prescribed, goals will not be achieved"*. It was noticed that formal communication took the form of official correspondence via an online system; however, informal talks did normally precede to minimize formal correspondences. Sometimes, both formal and informal communication went together. Figure 1 describes the several interactions.

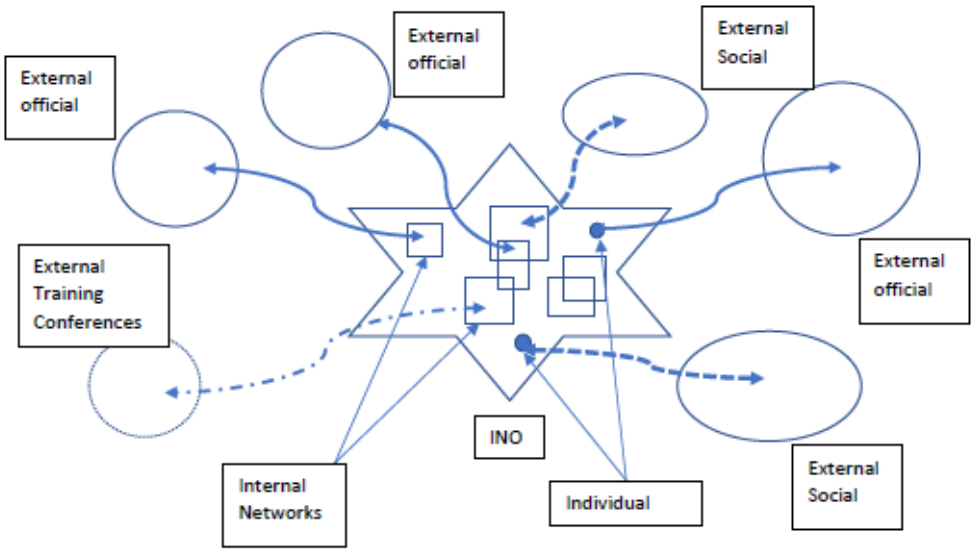

Figure 1: Networks in Action

Within INO, connections with external networks came either directly through direct contact with members of other networks or indirectly via a link from internal or other external networks. Direct interactions may occur during formal joint events (e.g. conferences) or informal events (e.g. weddings). Here, normally, a bridging actor initiates the connection, which might develop. These personal networks open doors to other networks. For example, family, social grouping and friendship-based networks are utilized when needed for the achievement of aims. Another form of networking with external organizations occur because of direct contact. Training programs, conferences, joint missions…etc. provide invaluable opportunities for networking. INO had connections with a big number of both public and private organizations in the country. An example of an external network is provided by I5 who stated that *"Because of the Director-General's personal relations, we are about to establish a partnership with the National Centre for Statistics and Information to support some of our projects"*. I8 also demonstrated how external informal networks had helped them: *"Based on an initiative from a colleague who has [external] ties, we had all participants in a recent project honoured in an official ceremony"*.

The third key reason behind the creation of informal networks (both internal and external) were events. These event-based networks may develop/activate because of uncertainty or opportunities. Here, single or multiple networks might cooperate or join, or (a) new network(s) might appear. Recently, with limited resources, INO's activities, like any other public entities, had witnessed great decline. Almost two-thirds of INO's activities scheduled for 2015 had to be postponed or cancelled. Driven by this need, INO members started looking for alternatives to ensure continuity of their operations. This initially started with personal initiatives from individuals within departments. The aim was to finance their own departmental projects; however, it became an organizational aim later. The start was with a member of one department who had connections with people in the oil industry. Although this became a formal Corporate Social Responsibility (CSR) project in 2016, it all started with informal communication in 2015. The project secured

financial resources needed for an initiative aiming at introducing sustainable practices to school buildings - solar cells to generate clean electricity.

The last cause for the development of these networks was non-work-related aims. These normally supported members to achieve personal, social, economic…etc. achievements that did not relate to work. Yet these networks could be utilized when necessary for work-related issues. A basic example was the financial cooperative between members. Here, people contributed shares into a fund, with one taking the money every month in turn. This was to help people raise money, especially when one is in need. Another example was family gatherings between some members of the organization. These gatherings served the social needs of family members, especially those who originally came from other regions.

Risk management:

In INO's context, informal risk management depended on whether the risk was internal or external (whether caused or can be solved by internal or external factors/actors) and the scale of the risk. When confronted with an internal risk, members normally turned to department-level networks to clear the situation. Here, if the risk was manageable, network members either sought individually to sort the issue or activated other internal networks within the organization. In some cases, the whole organization might be deployed for this purpose, depending on the scale of the risk. In 2014, one day before a major high-status conference organized by INO and a leading UN organization, members realized that conference documents and files were not ready. To make sure that more than 300 participants will receive their complete files, INO members worked until 5 A.M. and prepared files hours before the opening ceremony. Working members came from different departments, with even mothers of young children staying till very late.

When the risk was external, network members activated their personal external networks (e.g. family) to help overcome the threat. It is worth noting that when the situation was extreme (solving the risk require immense resources or power), the people with the highest status normally had the most influential informal connections needed to overcome

such issues. In 2016, a few days before the start of a national seminar organized by INO in collaboration with an international organization and a national university, members of the department overseeing the event realized that they needed a security approval for the event (a new procedure not required before). Efforts were taking place at the department-level network to resolve the situation with external networks; however, that was not enough. The issue involved great responsibility and liability. Then, members turned to other actors within the organization to support them. Only the Director-General (DG), through his ties with external links, managed to solve the issue. Although the event had to be rescheduled just a day before the opening of the seminar, all issues were resolved in a friendly manner including hotel reservations and invitations. Most importantly, liability and legal consequences were avoided.

Balance of interests:

In INO, internal networks appeared to be multi-layered with people sometimes having personal, group-level and organizational-level interests. These different interests may be attributed to various causes (e.g. professional, economic, social…etc.). The issue of interest is already very difficult to study due to its complexity, in addition to its being implicit in many occasions.

The first observation regarding INO's informal networks was the keenness of members to consider the interest of all internal stakeholders. Although this was not discussed explicitly, this seemed to be a code followed by everyone. In any situation where a decision/action may impact other internal stakeholder's interests, the situation was reconsidered by the decision-maker. This was the first monitoring mechanism at the personal level. The second mechanism was at the department-level network, where in case a member had not noticed the issue or missed it, others would alert them. The third mechanism was the organizational-level, where people from other department or organizational-level networks, including those affected by the decision/action, interfere. Evidently, all members made sure the overall cohesion of the network was preserved. The main drivers here were personal ethics, group ethics and the common good of the organization-wide network. Personal ethics represented morals expected from any

member, which were deep rooted in the culture and may be impacted by the organizational culture. Similarly, group ethics represented the collective morals of the group (e.g. department, organizational…etc.). The common good represents the joint endeavours to create and maintain a good organizational reputation. However, how are these mechanisms enforced and activated? It seems three factors were vital here: personal reputation, status and societal punishment (exclusion).

People sought to preserve their reputation within networks, perhaps to realize self-esteem. Any attempt to make gains at the expense of others, was both a social disgrace and a violation to the implicit code that governed the network. Such behaviours, which were very rare, were considered disrespectful to those affected and the network in general. The actor might be excluded from the network, besides being ashamed. This can be an issue for a very long time, as people might carry this through other networks. Such people may find it difficult to have access to resources within or outside the network. The situation was worse when the actor enjoyed a high status within the network. People with high status were perceived to be role-models, and any violation was amplified and so was the shame. Societal punishment, as mentioned, can come in the form of, inter alia, shame, loss of trust and seclusion from the network. Two members had suffered from this social punishment, leading to them being marginalized both in the informal network, and to some degree the formal network. The two were seen as violators to the common good rule, prioritizing personal interest. The impacts were more evident in the case of the first member who used to have high status. His unwillingness to cooperate and contribute to the overall good of the network was perceived as an act of disrespect and hypocrisy. These informal codes seemed to be effective in governing the cohesion of the informal organization.

In case of external networks, the same applied in terms of personal reputation, status and societal punishment. However, here, since there might have not been a continuous common good between actors, interests were mostly negotiated explicitly. This also applied to new links to convince the other actor of the feasibility of the relationship. I25 explained that, in relation to external ties, *"No one gives anything for free. There is always*

a fee". This demonstrates the explicitness of interest consideration. At the beginning, trust alone might not be enough, but later it might develop into a catalyst for interaction. The biggest drive for considering the interests of those involved was fear of losing the informal link to the other network. Such loss might deny access to essential resources. Yet with time and frequent interaction, the relationship might develop and barriers overcome. In case the interest of the other actor was violated, the link was disconnected and a mediator may have been required. The situation might be resolved through negotiation. It is worth mentioning that beside the violator himself/herself, any person who linked him/her to the affected may have his share of blame in case of 'failure'. In such a case the violation was extreme, all connections between the two networks might be affected, and formal procedures are the only means for communication and negotiation. In late 2013, INO was about to go through major restructuring, which meant that new divisions were about to be introduced and others terminated. This attempt was one of many similar restructurings by INO over a number of years. The national regulations stipulate that another governmental body must review and certify the new organizational structure. The reform plan had been discussed between the two governmental bodies for years, until 2013 when an INO member adopted it. This member's network of relations with active members within the other organization accelerated the process by circumventing the formal channels and holding informal talks. The negotiations focused on getting the structure approved, while at the same time freeing the other organization from any legal or financial consequences. With all interests explicitly cleared and negotiated, the new organizational structure was approved in mid-2014.

Considering the interests of relevant stakeholders is more complicated when it comes to dealing with risk as it might not only involve access to resources (e.g. information, financing, etc.); it could mean transferring responsibility or risky consequences too. INO had witnessed different networking strategies to deal with risks informally, namely, mobilizing its internal or external networks or both, connecting to new networks, forming a new network, or dissolving the network(s). Again, the type of the risk (internal vs

external) and its scale defined the response. In case of internal risks, actors sought to solve the issue within department-level networks. When the efforts fell short, other actors from across the organization joined. In case solving a manageable risk that does not entail jeopardizing the interests of others, except those involved, the concerned network decided. This was normally preceded by negotiations, if the solution might have affected internal actors' - those involved - interests. Otherwise, the discussion of the situation might have not addressed interests. The case of the global conference showed how resources were mobilized to overcome the issues. Mobilization started at the organizational level, as the common good and reputation of the organization was at stake. By morning, national and international figures would have formed a judgement being either a good or an inadequate organization. This spurred action from INO members to save the situation, regardless whether that was their job or not. In some cases, dealing with internal risks require resources residing within external networks. External actors' interests are addressed before approaching them. The aim is to ensure having them on your side. In case they have any further concerns/interests, these were either solved or trusted mediators provided assurances. This 'guarantor' derives his impact either from his existing relationship, status or trustworthiness.

Another strategy for informal risk management was connecting to new networks. This occurred either through a mediator or through direct contact. Here, both parties made sure all was clear to avoid any misinterpretation or ambiguity. Interests were explicitly discussed and negotiated. The common overall good of the country or nation was normally used to influence the decision of the others. The deployment of emotions could be seen as a stimulator of response. The case of the national seminar demonstrated this approach. Since major required resources were (e.g. conference hall, participating students, etc.) within the concerned university, it was crucial to connect both INO's and the university's networks for initial check of intentions. This involved personal phone calls and meetings with an academic, who adopted the idea and negotiated interests. The university perceived it as a training and marketing opportunity, but it had to fit their agenda. This triggered negotiation with the third party (the international organization) to

modify the themes of the seminar. When this was achieved, the green light was given, and formal procedures took place. Having the common interests of all parties addressed, proved to be vital later when the event was almost cancelled. This would have led to financial losses, besides affecting the reputation of the parties. However, because every party looked at the event as a credit, they collaborated to overcome the situation and reschedule the event.

When existing networks did not provide the required resources to deal with risks, a new network might have been formed. Informal meetings play an important role paving the way for networking. These might start with formal arrangements before establishing informal relationships. The other network may not be aware of its role in risk management. So, the overall good of the nation will be more than enough, especially, for parties interested in CSR. In 2016, based on a previous commitment to host a large continental event, INO was under pressure to find resources for the big event. The organization had about 50% of the required financial resources. As a result, a decision was made to introduce a new education-supporting network. The idea was to establish a fund that public and private entities contribute to, offering them marketing opportunities in return. Although the initial idea looked attractive for organizations, it took intensive negotiations to convince the firms to join. Ranking of sponsors, location within avenue, visibility of logos, etc. were perceived crucial to contribute. A notable aspect was a contributing bank which apologized when previously addressed formally. Fortunately, the initiative succeeded leading to hosting a successful conference and exhibition.

However, in real life, not all risks are solved successfully, neither required resources are necessarily attained. Hence, informal risk management might fail to mobilize the required resources despite all attempts. In such moments, the network might collapse or be dissolved. This might be a way to deal with risk (risk avoidance) or depart from the risk itself. The informal network leaves the stage for the formal organization to deal with the situation. In 2016, while preparing for its participation in a UN level event, INO was struck by a decision to reduce its delegation by almost three-quarters. That was because of the economic situation resulting from oil price collapse a year earlier. INO high-status

members used their influential connections to ensure the delegation could meet the minimum requirements. This involved informal phone calls, meetings, and emails. However, all efforts failed and formal procedures then followed in accordance with the austerity measures.

Mutual benefit:

As shown through the previous discussion, mutual benefit plays an important role for purposeful interactions (when the purpose is the acquisition of resources or transfer of impact) within informal networks, especially, when it comes to dealing with risk. The benefits or rewards can come in various forms, including, monetary returns, recognition, status, prestige, pride, common good, self-satisfaction, etc. In case the efforts aim at risk elimination/mitigation, risk/disgrace avoidance can be in itself the reward. Other possible forms of reward are continuity of operation, organizational reputation, safety, avoidance of liability, etc. Although all actors within INO networks worked for the common good of the organization, mutual benefit, though related to the organizational context, has a multitier scope. It takes place either at the organizational, group, or individual level, with each respective level feeding into the next. Organizational level ethics, values and norms shape mutual benefit across all levels. These ethics, values and norms determine the broad lines to be or not to be crossed (expectations). Hence, personal or group benefit need to take these expectations into consideration.

Within internal networks, mutual benefit was normally implicit as all work for the common good of the organization. So, facilitating the role of others fell under this common good. However, mutual benefit could be articulated explicitly in certain occasions: to mobilize support and resources, attract due attention and warn others. For a successful and effective mobilization of people and other resources, mutual benefit seemed to be a stimulator. It worked both at department and organization-level networks. This was especially used when introducing new projects that required support. This normally involved individual and group negotiations to push the efforts ahead. The case of the 2014 conference showed how mutual benefit pushed people to give everything they could to ensure maintaining the good reputation of their organization. At the end, this

reputation benefited their own work reputation. Similarly, the expression of mutual benefit might be intended to emphasize or highlight an over or underrated issue. The aim here is to make sure actions (perhaps corrective) are taken. A familiar conversation in this regard was efficiency. On regular basis people were reminded of the importance of reducing expenses to ensure all departments got their share and a variety of initiatives were realized. Also, explicitly expressing mutual benefit can be a sign of warning. It can be a warning against a violation of the common good of the group, a sub-group or an individual. This refers to the protective mechanisms discussed under balance of interests. Or it can be a reminder of conflicting interests that impact the balance in mutual benefit. Finally, it can be a warning for possible consequences that might affect mutual benefit. In this case, it is either an opportunity to be ceased or a conflict to be avoided. For example, prioritizing one's own benefit over the overall benefit of the organization triggered conversations on mutual benefit. Examples were normally given of former and current members who violated this principle and how had this affected them. Expression of mutual benefit can serve one or more of the functions presented at the same time.

Within external networks, on the other hand, mutual benefit was always explicitly expressed. In fact, it was the essential block for any cooperative relations. The aims here were again to mobilize support and resources, attract due attention and warn others. Here, negotiations always took place and mutual benefit was a powerful instrument for the achievement of goals. The cases of the cooperation between INO with the local university and with the oil company illustrated how mutual benefit drove those attempts to overcome challenges. The oil company that supported the sustainability project fulfilled its CSR role, while at the same time reflecting support to both education and sustainability. This reflected a green side much needed for firms known for their negative impact on the environment. INO, on the other hand, got the resources required to finance its initiative in a time marked by high uncertainty due to severe shortage in financial resources. The INO member who started the initiative via his personal links gained recognition at the individual level. In the other case, for the university, hosting a national seminar was an opportunity to enhance its image as an educational hub and show support to national and

international initiatives that reflected a good image of the country. The third party, international organization, showed how it supported initiatives in different countries around the globe. INO fulfilled its role as a leading national body in the field of education.

No doubt mutual benefit remains a complicated issue, especially, when individual, group and organizational benefits cross or conflict. This might lead to bias or obstruction. When people's benefit is aligned with the organizational benefit, it is perhaps more likely that people will use their informal connections to ensure continuity of operation or to overcome challenges. The case of the new organizational structure resembles this. The new structure meant that new posts will be added, so promotions and new job titles would be granted. Thus, personal networks were activated by those more likely to benefit from this. Since both individual and organizational interests of those involved parties were considered, a deal was reached. Another example was the reduced delegation to the UN-level conference. The attempts to convince the government of the importance of having a large delegation stemmed from personal benefits. The remuneration and incentives for participating members are rewarding. Despite this was against the overall good of the country, informal networks were activated to find a solution. However, because of the absence of mutual benefit, those efforts went in vain.

Role of formal structure:

From the abovementioned discussion, it can be noticed that the formal organization/network have a clear impact on informal networks. First, informal networks within INO had been developed and shaped by the formal structure. Both department-level networks and other broader ones had resulted from the interaction triggered by the formal structure. Similarly, power of actors seemed to come from the organizational structure. Those with high status did have more power because of their links to influential figures. External networks had also developed because of the formal organization as in most cases those had been either directly or indirectly facilitated by the formal organization in most cases (e.g. Joint formal meetings, training sessions, events, etc.). For example, networking with the academic from the university started in an INO formal event several years ago, where he presented a paper. Second, the informal conversation

was spurred by issues coming from the formal organizational setting. Both opportunities, bureaucracy, challenges and risks that required network-level efforts stemmed from work activities and interactions. The formation of the new network in 2016 before hosting the conference was because of a need within the formal organization. Add to that, the interaction among people created a sense of belonging to both the organization and the group. Hence, even non-work-related issues could be sympathized with. In 2016, due to an incurable disease, an employee could not get back to regular work following her treatment and recovery periods. This meant she could be retired or sacked based on national laws. However, her situation provoked feelings of sympathy among her colleagues, who through the powerful female network resolved the issue.

Third, surprisingly, although informal networks have no hierarchical order, the status of people within the formal structure remains influential. When it came to solving large-scale risks or gaining access to valuable resources, people's status (rank) remained instrumental even within informal networks. Similarly, influence was also derived from links with influential actors or networks. In most cases, this influence is related to one's social power coming from his/her rank in the society or organization. The DG was the only person capable of resolving the seminar issue in 2016 using his informal links. Forth, the extent to which people are willing to cooperate to overcome a risk is governed by possible consequences mostly stemming from the formal structure (e.g. loss of job). The collapse of the attempts to maintain the same number of members in the delegation to the UN-level conference was because of fear of consequences. Since austerity measures were set by the Council of Ministers, breaching the rules here would have led to disastrous consequences.

Conclusion:

Business environments are marked by times of prosperity, stability and others of uncertainty. Organizations need to gain the most of the first of these, sustainability in the second and be well prepared for the last. Living under uncertainty necessitates unconventional approaches to overcome challenges and risk. This is why very sophisticated risk management approaches have been adopted. These, often, data driven

methodologies and models have provided support to the formal risk management mechanisms. However, not all risk-related interactions occur within formal channels. Some, if not most, do flow in the hidden informal organizational space. Many initiatives, projects and solutions start through these informal networks and might find their way later to the formal network. This paper argues that for informal risk management, mutual benefit plays a central role. Whether it is implicitly or explicitly expressed, mutual benefit is a powerful instrument to acquire resources necessary to eliminate/abbreviate risk. Mutual benefit encourages actors or networks to intervene when a member is confronted with risk. This principal is maintained through self and group mechanisms: personal reputation, status and societal punishment. These gateways enforce discipline or punishment when mutual benefit is breached.

Although the role of informal networks in risk management has been studied by several scholars before, there is a lack of research on the role of mutual benefit in informal risk management and how the interests of all parties are maintained. Thus, this paper contributes to the conversation on informal networks, especially those related to risk management, by providing empirical evidence on how mutual benefit governs risk management within these networks. It shows that mutual benefit is the driver behind interventions stimulated through informal networks. It also contributes to the literature on social exchange theory by explaining how mutual benefit is maintained by individuals and groups. Self-enforced measures to maintain one's own reputation and status, beside group-forced punishment are the main deterrents. Emotions (e.g. shame, fairness, etc.) seem to be integral in these protective mechanisms. Finally, the paper contributes to the literature on socio-technical networks by demonstrating how formal networks impact informal networks. The main notable observations provide somewhat contradicting inputs. Formal status plays a crucial role in informal risk management, while at the same time formal structure can be a barrier to informal risk management, due to the consequences it imposes (e.g. loss of job).

The paper has also some implications to policy. Informal risk management mechanisms need to be considered, with mutual benefit being in mind. This consideration should take

both the interests of the relevant parties and the possible consequences of any breach. By building and maintaining mutual benefit, organizations can have a wider pool of resource to deal with risk and uncertainty. Add to that, organizations should understand the powerful impact of the formal organization on informal networks. Although power centres within informal networks might differ from the formal network, it seems status stemming from the formal organization still plays a central role.

This paper's results are based on a specific context, which might limit them. The introduced cases were chosen based on the author's direct involvement to ensure accuracy and precision. This might facilitate informal risk management interventions, while other contexts might perceive the issue differently. People's intention is another issue. It is not possible to determine one's intention from getting involved in any informal risk mitigation/elimination attempt. Add to that, all cases, except one, involved normal interactions. This does not shed light on mutual benefit during conflict or in hostile environments.

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Appendix E

Housekeeping for resilience: how internal transparency impacts organizational resilience

Mohammed Al Balushi

Abstract

With the rise of New Public Management, transparency gained increased importance. Plenty of research has been undertaken to address its importance and role, yet the vast majority concerned with external transparency, leaving internal transparency understudied. In particular, there is a lack of research on the relationship between internal transparency and organizational resilience. Using inputs from 32 semi-structured interviews, I seek to investigate how internal transparency impacts organizational resilience in a knowledge-based public entity. I also examine how management systems impact internal transparency, thus, organizational resilience. The findings indicate that internal transparency contributes to better preparedness to adverse conditions by enhancing the ability to cumulate, locate and share knowledge, which in turn improves learning, sensemaking, vigilance and response. The findings also show the important role management systems play by raising the level of internal transparency through the enhancement of communication flow, use of indicators and accretion of an archival database.

Keywords: transparency, internal transparency, organizational resilience, risk management, management systems.

Introduction

Information flow is a catalyst for organizations to create value (Narver & Slater 1990), promote performance (Forza 1995) and enhance competitiveness (von Krogh 1998). Hence, information location, sharing and utilization are key, especially for knowledge-based organizations. Although New Public Management (NPM) has had tremendously enhanced the role of transparency within the public sector [e.g. Hood (1995), Hood (2006), Lapsley (2009) and Lapsley & Rios (2015)], some have still criticized emphasizing external transparency over internal transparency [e.g. Lapsley & Rios (2015) and MacLean (2011)]. Since internal transparency ensures involved people understand processes, it is indeed instrumental for improvement and goal achievement (George 2003) and dealing with abnormal situations. Beech & Crane (1999) stress that transparency provides good results under both normal and non-normal conditions.

Resilience remains an understudied aspect in relation to transparency, especially, in the public sector. Moreover, it is still not clear how management systems may contribute to resilience via promoting internal transparency. By shedding light on both how management systems impact transparency and the impact of internal transparency on resilience, the paper seeks to empirically establish better understanding of the role of transparency in risk management. This in turn aims at closing the current gap and stimulating further research.

The paper starts with a discussion on the role of information flow in organizational performance. It moves then to introduce transparency and connect it to risk management and organizational resilience. Next, it briefs on management systems, and ends the discussion with a case study attempting to provide empirical evidence to fill in the research gap.

Background

No doubt information flow is key for business performance, especially for knowledge-based organizations. According to Narver & Slater (1990), communication and coordination between functions are key to create

customer value. Forza (1995) shows that information exchange with both suppliers and customers has great impact on quality performance. Hence, von Krogh (1998) confirms that Knowledge management aims at utilizing organizational knowledge to enable an organization to compete. However, as Christensen (2002) notes, communication within an organization needs to be viewed in a holistic approach. In other words, the 'silo' effect must be avoided and information shared organization-wide. Hansen (1995) reports the findings by both Bavelas (1951) and Leavit (1962) who demonstrate empirically that any restraint on a small group's communication undermines their ability to tackle complex work. It is likely that communication problems hinder ordinary work. Leavitt (1962) adds that the lack of communication between members of the organization yields inconsistent results. Thus, one of the biggest challenges employees face is location of knowledge (Alavi & Leidnaer 2001), which impacts performance. Ang et al. (2000) introduce eight critical components that they believe are critical for quality results. These include information and analysis, and HR utilization, which emphasize enabling access to and sharing knowledge. In fact, one of the main features of the quality movement has been emphasising open communication organization-wide.

Hood (1995) shows that as a result of NPM, transparency has gained more prominence since clarity in role assignment and authority have become essential. Besides, NPM has emphasized the setting of measurable standards and control mechanisms. That has been based on the practices prevalent in the private sector. According to Lapsley (2009) and Lapsley & Rios (2015), with NPM, more emphasis has been placed on transparency. Hood (2006) perceives transparency in contemporary public management 'quasi religious'. According to Heald (2012), "transparency is a mechanism through which the principal can exercise surveillance over the actions of an agent". He adds that in symmetric relations, both the principal and agent can view the processes of each other. However, in many cases it ends being one-sided (top-down). Looking at its significance, prominent international bodies (e.g. IMF and OECD) stress the importance of transparency in public finance (Lapsley &

Rios 2015). For Lamming et al. (2001), transparency is an element of supply relationships like agreed procedures, long-term partnership…etc. Furthermore, Beech & Crane (1999) find that in order for organizations to develop high performing teams, transparency, checkability and a climate of community are crucial. They explain that change from ordinary to high performing teams require enhanced awareness and engagement in planning, both at the business and team levels. At the same time, this change needs a transparent environment where improvements can be measured. The team members should know how they are measured and how they are supposed to measure others. Most importantly, team members must know how their actions affect organizational practices and outcomes.

Transparency

The literature introduces external and internal transparency. Street & Meister (2004) state that external transparency is communication to the environment outside the organization. According to Ahrens & Chapman (2004), organizations normally use budgets to make their processes externally transparent. However, MacLean (2011) warns that organizations' desire for external transparency might have led to reduced focus on internal transparency. Street & Meister (2004) define internal transparency as "an outcome of communication behaviours within an organization that reflects the degree to which employees have access to the information requisite for their responsibilities". MacLean (2011) emphasizes that transparency must start from within. In the case of Enron, for example, ordinary employees were not aware of any issues and struck by the real situation of their company. MacLean (2011) exemplifies that external reporting might be a legal requirement that organizations have to comply to, but internal reporting entails a lot of information that outsiders may not need to know (e.g. defect rate) in order to detect progress. Christensen (2002) shows that managers when dealing with corporate communication appear to take it for granted that their organizations are transparent. This 'false transparency' is in itself a by-product of the lack of transparency. Similarly, Lapsley & Rios (2015) argue that most research on transparency ignored internal transparency and

focused on external transparency. They point to the novelty of the issue of internal transparency.

MacLean (2011) reminds that whatever the volume of external reporting is, it cannot replace internal transparency. Pointing to the collapse of businesses at the time, he establishes that firms that may look healthy from the outside, may be actually at the edge of collapse (e.g. Enron). Christensen (2002) also expresses that external evaluations in themselves are not enough to ensure transparency, regardless of the valuable information they provide. External evaluations are snapshots of particular periods, which can reflect the unreal situation. Ahrens & Chapman (2004) suggest that internal transparency is concerned with the 'visibility' of processes to members within an organizational setting. Street & Meister (2004) introduce internal transparency as the construct that "reflects the extent to which the management team understands the activities and outcomes of the organization, which is partially determined by the team's communication behavior". Beech & Crane (1999) refer to multi-dimensional transparency, where both the bottom is visible for those in the top and vice versa.

Lapsley & Rios (2015) explain that the majority of papers consider disclosure of information an achiever of transparency. For Ahrens & Chapman (2004), a successful internal transparency is one that allows 'layered' access to information to ensure no overload takes place. George (2003) emphasizes that work which is invisible to people cannot be improved. Simply, people cannot improve whatever they cannot see or perceive. Likewise, Ahrens & Chapman (2004) show that analysis is dependent on internal transparency. Street & Meister (2004) deal with internal transparency as an ordinal measure that plays a role between communication patterns and outcomes like decision-making. For example, Ahrens & Chapman (2004) mention flow charts as a supporting tool that enhance internal transparency and facilitate problem-solving. Roge & Lennon (2018) theorize that a successful performance measurement system is capable of visualizing both effectiveness and efficiency, which result in internal transparency.

Street & Meister (2004) show that as communication level is reduced, internal transparency follows in the same direction. They demonstrate that reduced internal transparency results in difficulty as management becomes less aware of issues within the units around them. They also prove that reduced internal transparency results in more difficulty in task performance, which truncates the time dedicated for planning. On the other hand, Braunstein (1999) demonstrates how Ford managed to tremendously improve its performance through enhanced visibility, improved information-sharing and use of models. As a result, Ford cut time to introduce a new model from concept to market by a third. This explains the surge toward cross-functional teams under quality initiatives.

Biondi and Lapsley (2014) and Lapsley and Rios (2015) identified three levels of transparency: 1) access to information is perceived to meet transparency requirement, 2) basic understanding is perceived to be a better achievement of transparency 3) and more complex understanding take place, 'shared meaning'. The BL model is a basis for assessment of internal transparency and was used for that purpose in studies, including the public sector.

Transparency & Risk Management

Lapsley (2009) shows that the increased adoption of risk management practices in the public sector is due to NPM, which imitates the practices of the private sector. He asserts that risk management has grown to include increased focus on processes, audit and documentation. This resembles risk management from the audit society perspective. Beech & Crane (1999) emphasize that transparency, checkability and a climate of community are likely to introduce good results under both normal and adverse conditions. Ahrens & Chapman (2004) conclude that when employees understand assigned operational tasks with the broader organizational objectives in their mind, they better utilize available management systems to deal with emergencies. According to Garcia (2006) and König et al. (2017), for an organization to survive an adverse event, its respond should exhibit both effectiveness and timeliness. Garcia (2006) says: "Speed matters, and time is

a leader's enemy in a crisis". Ahrens & Chapman (2004) suggest that internal transparency is an enabler for the use of management control systems. Christensen (2002) demonstrates that Total Quality Management and process reengineering, among others, aim at enhancing efficiency by improving visibility. Power (1999) associates transparency with auditability and disclosure, though Hood & Rothstein (2002) hint that audits may be used by management as a buffer against blame.

With growing uncertainty, organizational resilience, among other risk management approaches, has gained more significance over recent years (e.g. Ponomarov 2009; Goetsch & Davis 2014; Kantur & Iseri-Say 2015; Sahebjamnia et al. 2015; Hosseini et al. 2016). Vogus & Sutcliffe (2007) define organizational resilience as "the maintenance of positive adjustment under challenging circumstances such that the organization emerges from those conditions strengthened and more resourceful". In simple words, organizational resilience refers to the capability or characteristic that enables a system to adapt to adversaries and regain operation. North & Varvakis (2016) clarify that organizational resilience introduces a mentality shift by emphasizing readiness for quick changes under abnormal (adverse) conditions. So unlike traditional risk management approaches that were mostly reactive, organizational resilience is proactive. The Australian Government (2011) shows that organizational resilience concentrates on three aspects, namely, protection, performance and adaptation, where the first is about building-in robustness, the second is about doing things right first time and responding promptly, while the third is about coping with changes.

Rose (2004), Tierney & Bruneau (2007) and Orchiston et al. (2016) say that two types of resilience exist: inherent and adaptive resilience. Inherent resilience is performance under normal conditions, while adaptive resilience is performance under abnormal conditions (e.g. difficulties, crisis…etc). According to Van Gorder (2013), for an organization to be resilient, it needs to base its performance on eleven principles: transparency, honesty, consistency, continuous reflection, faith in leadership, pride in organization, continuous and effective real-time communication, accountability,

compassionate leadership, stability and engagement. The Australian Government (2001) points that organizational resilience supports open communication and eliminates silos. Mendonça & Wallace (2015) affirm that organizational resilience pays attention to communication with external partners and competitors (boundary-spanning capability). Cole (2015) shows that for a firm to become resilient, it needs to: 1) acquire knowledge to be ready for adversaries, 2) reduce uncertainty, 3) and reduce exposure to risk. Cameron & Quinn (1999) emphasize the roles of both resources and expertise for enhanced resilience. Mallak (1998) indicates that for a successful adoption of organizational resilience, management should 1) practice positive reinforcement, 2) provide constructive feedback, 3) delegate decision-making and ensure resources are allocated, 4) implement a communication-facilitating organizational structure, 5) and grow bricolage skills.

The discussion on organizational resilience highlights the importance of communication, especially, internal communication for improved resilience. Sharing knowledge and information should enhance preparedness and response. As Van Gorder (2013) explicitly expresses it, transparency is crucial to create such an environment.

Management systems:

The British Standard Institute (BSI) (2018) introduces management systems as "systematic frameworks designed to manage an organization's policies, procedures and processes and promote continual improvement within". ISO (2018), on the other hand, refers to management systems as "the way in which an organization manages the inter-related parts of its business in order to achieve its objectives". According to ISO, the objectives may address various topics such as quality, efficiency, health, safety and environmental aspects. Perhaps ISO's own quality management system, ISO 9001 is the world's most recognized management system. The standard was first introduced in 1986 (BAB 2016). It stipulates a set of requirements for a quality management system (ASQ 2016). Albuquerque et al. (2007) and ASQ (2016) indicate that ISO 9000 certification reflects consistency and documentation of quality-

related issues. Although the standard was manufacturing-based at the beginning, it has evolved over times to include multiple industries. So far, 5 versions of the standard have been issued, with each introducing new improvements.

The 9001:2008 version of the standard had emphasized communication and transparency in a way or another via its 8 principles. The first principle, customer focus, necessitates understanding customer needs and integrating them in product/service provision (ISO 2012). This in turn requires having transparent communication with customers whether they are internal or external ones. The second principle, leadership, stipulates that leaders create a unified direction and clearly communicates the way to employees (ISO 2012). According to Abdul Samat et al. (2012), the third principle, involvement of people, is about ensuring people are engaged in every aspect of work, including the implementation process. ISO (2012) explains that engagement can result in self-assessment and evaluation with present criteria in place. The forth principle, process approach, requires setting clear responsibility and assigning clear roles (ISO 2012). The fifth principle, system approach to management, ensures that processes are perceived as an interconnected system. Thus, the processes, their components and links are recognized and understood (ISO 2012). BAB (2015) expresses that this enhances efficiency. ISO (2012) points that the sixth principle, continual improvement, aims at overcoming challenges and adapting to change. This requires coordination and continuous communication. The seventh principle, factual approach to decision-making, is about basing decisions on data and ensuring accessibility to this data when required. The last principle, mutually beneficial supplier relationships, focuses on having open communication and sharing information with suppliers (ISO 2012). According to BAB (2015), this principle enhances flexibility. Each of the 8 principles requires transparency, especially internal transparency, to be realized whether it is explicitly or implicitly expressed.

Case study

Several researchers have indicated the central role transparency has assumed with the rise of NPM [e.g. Hood (1995), Hood (2006), Lapsley (2009) and Lapsley & Rios (2015)]. Others, like Beech & Crane (1999), highlight the important role of transparency for the development of high performing workforce. On the other hand, many point to the fact that internal transparency has received less attention in comparison to external transparency [e.g. Lapsley & Rios (2015) and MacLean (2011)]. In particular, there is a lack of empirical evidence on how internal transparency affects organizational resilience. The paper investigates transparency with a focus on its impact on organizational resilience. It also considers how management systems shape transparency within the work environment.

The case study covers the Oman Ministry of Education (MoE), a public entity concerned with school education. Data collection was held in the ministry's headquarters in the capital Muscat. 32 semi-structured interviews took place between Jan and May 2018. Participants were chosen based on purposive sampling to ensure realizing the research goals. Note: throughout the case study, visibility is used to refer to internal transparency.

Management systems and internal transparency

Communication

The inputs from the interviews showed that the implementation of the ISO 9001 management system enhanced visibility via improved communication. According to Participant 28 (P28), "it is natural to see ISO impacting, since now we continuously raise awareness and have direct contact with all. We have booklets that detail the work mechanisms and tools. It is a clear and unbroken chain". P5 suggested that ISO promoted visibility across the different levels and ranks within the organization: "definitely it [ISO] has played a major role. First, top management is now aware of the details of any process, while in the past they only got results. Second, with steps known, obstacles and risks can be identified for each process…". However, P16 debated that although ISO enhanced visibility leading to better communication, this was one-sided. In other words,

employees had become more visible to top management, while top management was not equally visible to the employees: "…we as employees have no idea how decision making is made by top management". The majority, nevertheless, explained that communication in general decreased as you went up in the hierarchal order, but it did not disconnect. P26, for example, said: "due to the cooperative nature of work, communication flow is very high. The higher you go, the less the flow becomes. It is not difficult to contact top management. The Director-General himself may directly contact you". This might explain the weaker vertical visibility in comparison to horizontal visibility. Despite this, visibility showed to be central for enhanced communication flow.

Employee engagement

ISO implementation had also impacted visibility in another aspect, employee engagement. Here, the system enhanced role visibility, which facilitated better coordination and teamwork. Add to that, it provided indicators for those involved about the stage of work and any delays. P23 explained: "for example, when we prepare formations [employee distributions] and budgeting, ISO notifies us in case of a delay. Because in some cases planning is continuous all year and obstacles are normally encountered, ISO informs about your current stage". Similarly, P4 believed the system positively impacted employee engagement by enhancing visibility:

> "I can tell ISO has led to change. Now, the employee is the owner of the process/procedure and his performance is visible to top management. Any underperformance or problem may trigger direct contact between top management and the employee. This resulted from ISO implementation, which engaged employees".

P5 added: "…the ISO system recognises the contributions of every section. The final report mentions the pros, cons and issues in the departments and sections. Employees' contributions are mentioned, which is an incentive". Visibility provided by the system here seemed to encourage better performance since credit no more went to the department only, rather to specified employees.

Employee empowerment

In relation to employee empowerment, inputs showed that the standard had a positive impact by giving more power to employees. This resulted from

improved visibility in terms of roles, procedures and criteria. According to P19: "after the implementation of the standard, work has become more organised. I can now make a well-studied decision. For every application, decision is based on precise systematic criteria. It used to be based on trial and error – the conventional way". P28 added that improved visibility enabled accountability assignment, as every procedure and actor became visible: "now it is essential to identify authority and accountability; we determine who is accountable". P32 explained how enhanced visibility led to more empowered employees: "that is more evident now because we have set criteria for every work. There used to be criteria for the main domains, but now every procedure and process must have them. This gives employees confidence to make a decision…". P3 shared similar remarks: "ISO requires assignment of roles, responsibility and accountability. We need to know the first in charge and those to replace him…". P16 demonstrated that by enhancing visibility ISO enabled ownership and accountability, which empowered employees: "…now everyone has responsibility and accountability. Even seniors are accountable; hence, all do their best". P20 introduced the most interesting comment on this aspect by saying: "because it [ISO] clarified the roles and tasks of every employee, it returned some ripped authority to people". The inputs acknowledged the important role of visibility in empowerment.

Processes

In relation to processes and procedures, ISO enhanced visibility in a number of ways. First, it enabled in depth understanding of work procedures and performance. P2 explained the difference before and after implementing the standard: "it used to be chaotic. The employee did not understand the process, inputs, outputs or activities. s/He knew that s/he had to do particular steps (1, 2, 3). Now it is totally different". Similarly, it improved scheduling within and between units:

"since the different units work together, any delay in one department can affect other departments. For example, if I am behind schedule, the departments of procurement, stores…etc. will be delayed. The school year might start with us being not ready. The good thing about ISO is the definition of pre-set dates for every process. Everyone knows the dates and timing, and the consequences of any delay. Thus, we are committed" (P24).

Another enhanced aspect was learning; P4 highlighted that the rigorous documentation required by ISO enhanced visibility, which facilitated both learning and continuous improvement: "after implementing ISO, every activity had to be documented. First, we recorded the existing activity and then looked to improve it by questioning every step. It used to be unorganized in the past. Now it is more precise and sounder". P5 agreed and added the following: "with ISO, we knew the weaknesses and strengths in processes. We eliminated those weaknesses. The standard made the procedures and processes visible to everyone. When a new employee is recruited, s/he can learn the job by reading the syllabus". P30 indicated that improvement with ISO became beneficiary-centric due to enhanced visibility: "it requires measuring beneficiary satisfaction, so service can be improved". A main enabler of process visibility was the use of indicators. P7 revealed that by implementing ISO-initiated Key Performance Indicators (KPIs), visibility was enhanced: "…daily work has become more visible to employees. They know now the amount of work to complete every day based on the indicators. Employees also understand the consequences of delays…". Add to that, the standard promoted efficiency. P25 suggested that with ISO, location of expertise and knowledge had become easier: "in the past, we did not know what used to go in other departments. Now, for example, in case of a job title change, we know the exact departments to approach. ISO made it easier as I can get to knowledge fast". Similarly, P11 had similar thoughts: "ISO simplified work and enhanced visibility of procedures. Thus, efforts and time are saved".

Multidisciplinary

Participants pointed to ways ISO impacted visibility via enhanced multidisciplinary. According to P8, "ISO diagnosed the requirements for each job. Every employee is categorised under more than one requirement. It is as if one employee represents more than one person. The ISO diagnosis alerted us to missing capabilities in our section". This created a better understanding of job requirements and a basis for both recruitment and training of current staff. P9 showed how beside her normal work as a head of section, she both designed infographics and trained other employees to do that: "I have some expertise in design and designed infographics. These were appreciated by everyone here. As a result, I trained my colleagues here in the department". P26 explained that due to

ISO implementation, location of expertise became easier, which facilitated and nurtured multidisciplinary: "yes, ISO has had an impact. When you have an issue, you can refer to a colleague". P30 talked about role assignment as an enhancer of visibility and performance: "it [ISO] identified the person in charge and someone to replace him/her. This ensures continuity of work, which is definitely a positive aspect". It is worth noting that ISO requires the replacement to be equally competent, which further enhances multidisciplinary: "when the quality audit team asks me about a job I am supposed to replace another colleague when needed, I have to be as competent as the process-owner" (P19). Thus, people become familiar with their core tasks and other supporting tasks within the unit.

Cross-functionality

One of the main focuses of the ISO standard is teamwork. The standard recognises and encourages cross-functional teams. Since visibility facilitates accurate and faster location of actors, data and knowledge, it enhances these teams through appropriate assignment of roles. P26 commented: "with ISO, every person/department knows his/it role and other relevant people or departments are also known". Most importantly, by encouraging teamwork, visibility is promoted. According to P9, "we have a cross-functional team concerned with data flow within the organization. Being represented in the team, we are kept updated and share our data with others. This gives us an opportunity to gain knowledge and expertise". P5 raised an interesting fact saying that many of these teams were created as a result of the enhanced visibility ISO introduced: "these teams stem from the issues, disadvantages and risks ISO operations expose. ISO-related operations push these to the surface". P3 revealed that before ISO, these teams may have not followed up on their results or recommendations. However, with KPIs and monitoring mechanisms (e.g. electronic tracking) set by ISO, it is a must to follow up: "under ISO, teams are required to introduce analysis, results and recommendations, beside follow up…". Beside encouraging teamwork, the other main effect here was improving the visibility of these teams by setting procedures and requiring reporting.

Expertise-utilization

In relation to expertise utilization, enhanced visibility enabled both faster location of expertise and enhanced training. According to P8, "as per ISO requirement, we need to identify someone considered an expert in a particular field. Also, this person is further developed through courses". P26 shared a practical example: "for every task that requires data, I know who can help me - the person in charge -, so I can contact him directly". P14 provided another example: "because of my educational backgrounds, people here refer to me for advice, including our director and the director-general. I am often asked to handle issues based on my technical knowledge". P4 pointed to knowledge transfer resulting from ISO documentation: "expertise is retained either through coaching or documentation - electronic or paper based -, in case a person leaves for any reason". P27 added: "by documenting expertise, ISO has created a reference. This is the most important aspect". P1 highlighted that ISO required enhanced visibility since every experience needs to be shared: "when one Directorate-General finds a problem or a best practice, this needs to be communicated to the rest Directorate-Generals. For example, one Directorate-General designed a new electronic system for visa applications, which was later adopted by the whole organization". Being dependant on communication flow, no wonder expertise-utilization is similarly impacted by visibility.

Change-readiness

Adaptability is an important aspect for any organization. According to P19, ISO has introduced a major difference: "…people accept change when it is positive and transparent. You cannot anymore implement any system without considering the beneficiary. After ISO implementation everything has become visible". This could have two implications. First, with enhanced visibility, beneficiaries were more engaged and empowered, which resulted in rapid change. Second, with employees being aware of everything in their environment, changes could no more be enforced by top management without engaging employees. P3 points to top management engagement, which resulted from ISO requirements. This direct involvement led to rapid decision-making: "when we face any issue, we study it and pass it to the quality council to make a decision… ISO focused on this

aspect". P4 added that "ISO plays a role by exposing issues, which people were not aware of". This related to continuous improvement based on observed challenges or opportunities. P19 explained how enhanced visibility impacted change-readiness: "it [ISO] plays a major role. ISO aims at beneficiary satisfaction, which is achieved via transparency, another principle of ISO… if a beneficiary comes to see me, I am obliged now to give him/her details". Visibility meant being open to the other aiming at their satisfaction; it also meant being open to change when failing to satisfy the beneficiary. Figures 1 and 2 below describes the work environment in MoE before and after ISO 9001 implementation.

Figure1: The work environment before ISO 9001 implementation.

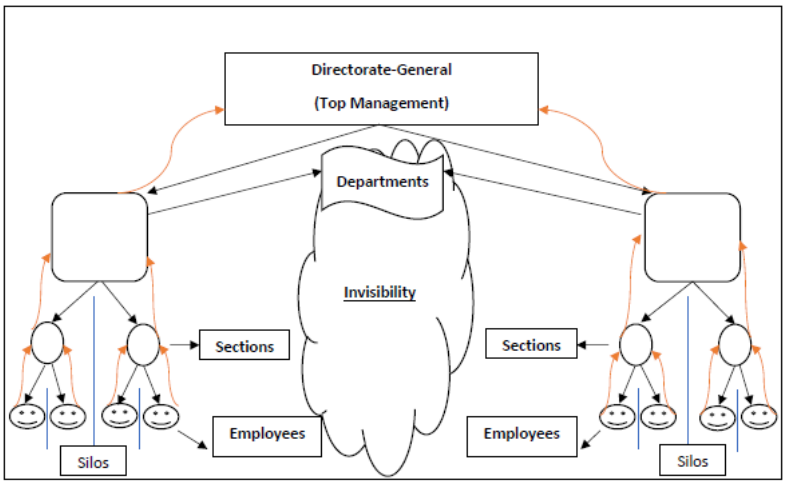
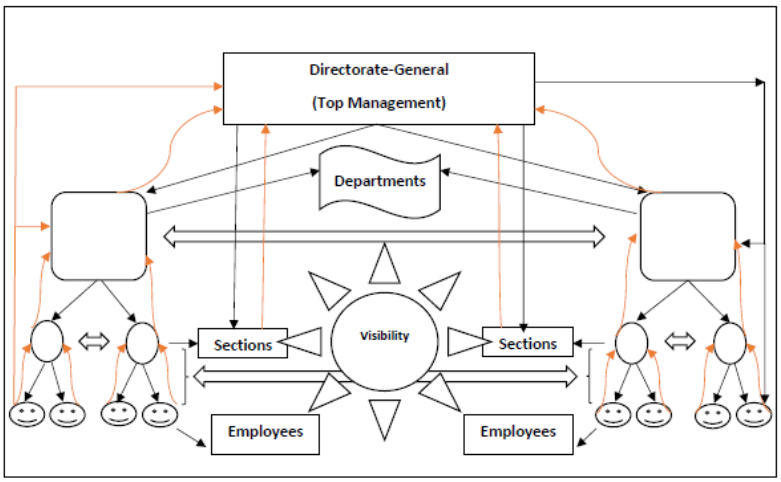


Figure 2: The work environment after ISO 9001 implementation.



Assessment against the BL Model

ISO implementation at MoE was aimed at three main outcomes: "speed, precision and transparency" (P10). These three attributes together were instituted as a slogan for the system, imprinted on almost every ISO-related document. However, transparency was the most frequently mentioned by participants (e.g. P10, P11, P16, P19), which may indicate further emphasis on this dimension. Based on the inputs above, the environment exhibited the third level on the BL model since employees had developed complex understanding of the internal context in terms of, inter alia, roles, assignments, location of information and adaptability measures. The model refers to this level as 'shared meaning'. Employees did not only understand the narrow scope of their own work, as it used to be before, rather they had expanded the scope to department-level tasks, and often beyond. As a result, location of both knowledge and expertise had become straight forward and efficient. This level of transparency accelerated work and decision making, including response to problems. Though not mentioned in the BL model, this paper treats rapidity as the forth level of transparency. Developing a complex understanding of any situation should be a rapid process, especially when dealing with risk, otherwise it may be futile.

Resilience

Risk identification and prioritization

It seemed the implementation of the ISO 9001 standard had introduced a mentality shift in terms of visibility, which in turn improved resilience. Comparing between the situation before and after ISO implementation, P14 said: "we did not identify risks; in fact, we did not address this issue. We had to deal with the problem when it happened". The standard required extensive reporting, including of challenges (risks). P14 elaborated: "the system [ISO] requires the identification and reporting of risks. We ensured the audit team we are in control of the risks, but they insisted on documenting and reporting them". This showed a strong tendency toward visibility. P1 added that "the system [ISO] includes an item on challenges that is introduced to the highest authority to make a decision".

The reporting system seemed to enhance visibility of challenges in the highest and lowest levels. P11 clarified that ISO introduced an important concept, risk prioritization. This emphasized the most threating ones to concentrate on and deal with: "we do prioritize risks; for example, we have risks like network problems, which deprives us from access to information". He continued: "before ISO, we did not have this level of transparency. ISO has tuned the process in terms of timeliness". P1 explained how risks were visualized using KPIs: "after the implementation of the ISO system, we have introduced a procedure known as prevention. Under this procedure we develop KPIs for the challenge, so it is anticipated and dealt with beforehand". He added: "during the implementation of the ISO 9001 standard, we started to identify problems such as overlapping among departments". P19 recognized the ISO audit report as a visualization method since it identified threats and opportunities: "ISO predicts risks and sets measures. In the final report, they include weaknesses and strengths that we need to focus on". Again, visibility was a key factor for risk assessment.

Organizational learning

Once more, the ISO report seemed to play a crucial role in organizational learning, an essential function for resilience: "learning takes place and ISO plays a role here. For example, if an employee underperforms, he gets a non-conformance. This has made the employee more vigilant and continuously seek to improve. Therefore, mistakes and underperformances have become learning opportunities" (P13). Similarly, according to P14, ISO documentation required learnings to be shared between colleagues: "when one attends an external course or conference, he transfers knowledge to other colleagues. It is all up to the person". P2 provided a practical example of learning:

> "when I improve my process for 2018, I do that based on the pros and cons observed in 2017. For example, I had 3 steps of which 1 consisted a particular risk. If I do not solve it, it will keep posing threats to me. Thus, I implement preventive measures and continuous improvement goes on".

She added: "the units implementing ISO exchange expertise among them and with other organizations". P28 demonstrated how learning was incorporated from the beginning of ISO implementation: "when implementing the standard, we wanted to move from the old system to the new system. The first challenge was

working on two systems. Hence, we worked on parallel learning and checked it through audits". P3 added: "when a mistake is found, the problem should be investigated. When a unit makes a mistake, it must be treated and a corrective plan instituted". P22 explained that "a non-conformance requires development and learning". P1 asserted that under ISO it was mandatory to share learned lessons with other units. P10 pointed to follow up by the ISO core team [department of quality] which enhanced expertise sharing:

"ISO plays a role via follow up. We hold sessions to share knowledge and quality personnel attend them. They bring their knowledge and expertise. For example, some stored materials were damaged due to rains. As a result, the ISO team developed criteria for store buildings and storage procedures".

P18 said that ISO-based KPIs had enhanced visibility, which led to more learning: "ISO impacts since it deploys KPIs. We get non-conformances; thus, we keep our eyes on these indicators". P8 summarized the situation saying: "ISO plays a role because it makes you fully understand your work. With the possibility of getting non-conformances, you are forced to prepare and learn for future events". P32 pointed to learning resulting from collecting beneficiary feedback: "we analyse beneficiary surveys and identify low performing indicators. The results are introduced and discussed, which requires improvement. We also have corrective actions and improvement cards under ISO". P24 highlighted the role ISO documentation played by enhancing visibility, leading to more learning: "we can now review written documents. Before ISO, we did not have serial numbers for correspondence and documents. Now, we have identification numbers and can easily locate and retrieve them". Finally, P25 raised an interesting fact about the role ISO audits play. He commented: "when I audit other departments, I become familiar with them and their work. This has accumulated expertise for me. We also have plans and procedures that are easy to find. Everything is clear now".

Sensemaking

Sensemaking, or understanding the situation before making a decision, is indeed a catalyst for effective risk management. The main form of sensemaking repeated by participants was surveying beneficiary needs. According to P22,

"currently, ISO focuses on beneficiary satisfaction. Now, decision is made based on a survey. The department of quality pays due attention to the survey, in particular the critical points. We hold meetings at the department level to solve the issues".

Equipped with better visibility in terms of beneficiary requirements, better responses could be introduced. P10 described how urgent issues were dealt with: "when we have a problem, we meet to discuss it. After that we seek a solution. If the issue is beyond our authority, the head of section informs top management to decide". P4 explained that this fact-based management was enhanced after implementing the ISO system: "fact-based decision-making is one of the most important principles of quality; thus, it was considered during the implementation of the standard. It is utilized during top management meetings". Another aspect that enhanced sensemaking via improved visibility was ISO documentation and reporting. These formed a rich database for more informed decision-making: "we do devise the documents to elicit sound decisions". Perhaps because ISO reports and publications present both the decision, evidence and justifications: "ISO focuses on fact and evidence-based decisions. It requires introducing the justifications behind the decision. It also recommends doing statistical data analysis" (P3). P32 emphasised visibility enhancement as a catalyst for better sensemaking: "ISO has a very very important impact because everything is now clear and visible. You can see what is going on before you". P4 added that "the KPIs resulting from the ISO system informs fact-based decisions".

Self-organization

Self-organization is the ability to change operation mechanisms to overcome any disruptions. As a result of the ISO system implementation, work plans and executing personnel, and alternative plans and executing personnel must be identified, documented and shared. This meant that always a second procedure or person is ready to replace the existing one:

"work does not stop when, for example, an employee is absent. In the quality forms we name two replacements. I can show you the form. For example, if Ali (name anonymised) is absent, I am his first replacement. He has a second replacement who is a female colleague, beside a third replacement" (P19).

ISO had also impacted through role assignment. According to P20, "ISO contributed to flexibility by identifying responsibility and authority". This in turn

enhanced the ability to change work mechanism without going back to top management. P4 explained that by saying: "there used to be some ambiguity in the past. After implementing ISO, the employee as a process owner knows and defines the risks and alternatives. The system requires that". Another perspective suggests that by setting clear timelines ISO forced people to reorganize their work and find new ways to overcome issues: "in terms of delays that cause non-conformance, ISO builds pressure to stay within the conformance zone". P26 also emphasized enhanced visibility as a major enabler of self-organization: "ISO has impacted by identifying and visualising work procedures in other units. I can, therefore, understand the work by reading the outline. Hence, I can provide support". A very interesting fact was presented by P10 who referred to the ISO report as a recognition that inspired mechanisms for self-organization: "being able to sustain operation under difficulty is an achievement for the unit. The ISO assessment covers the whole procedure from start to end. We do not want any non-conformance". Finally, P30 pointed that ISO institutionalized KPIs that showed employees their level of performance: "the employee causing any issue can evaluate himself against the original plan. It is called the job satisfaction KPI system".

Creativity and innovation

By enhancing visibility of performance and achievement, the standard encouraged more creativity and innovation: "creativity and innovation have been affected positively since employees now competitively seek to score high in both internal and external audits" (P30). P1 called the new environment 'positively competitive' since it led to new ideas. P32, on the other hand, explained that the ISO framework presented a platform through which people could present their creativity and innovation. According to her, "these are now recorded as good practices in the ISO report. I always tell my colleagues in the departments to document the genuine ideas because they are credit for the team. At the end, every unit aspires to highlight its own achievements". P1 added:

> "the difference between before and now was the absence of a clear route for the ideas to flow through. Hence, the idea died. Now, under ISO, the idea goes through a clear path within the ISO framework. Even top management is aware of these ideas now, since the ISO report is introduced to them".

P4 showed that by deploying the Plan, Do, Check and Act (PDCA) cycle for continuous improvement, employees had become more aware of their processes. This in turn led to creativity:

"since it is based on continuous improvement, in particular the PDCA cycle, a new culture of creativity has spread among employees. The employee has discovered that his daily work is a continuous cycle, so he either improves or stay still".

P5 gave a personal example showing how recognition through the ISO report was highly regarded: "ISO has impacted indirectly since having your idea in the report is a source of happiness and pride. For example, we had introduced the infographic initiative, which was visible to everyone. Seeing that in the report was amazing". Having a clear framework to report ideas, besides having their ideas recognized in the ISO report, employees were encouraged to introduce unconventional ideas.

Vigilance

Vigilance is another important aspect in risk management. According to P1, "after the implementation of ISO, we started to notice issues like specialization overlap". P2 similarly suggested that ISO audit skills had led to enhanced observation: "recently people have told me that I do focus on things others do not expect. They ask me where I have got that skill from. It is from internal auditing, which enhances your observation". She added: "we were trained on these skills for internal auditing. These skills involve high vigilance, so you observe what others miss". P15 reemphasized the role of the indicators ISO implemented saying: "ISO enhances vigilance because it involves notifications [e.g. KPI or follow up]. You get a letter from another following unit. ISO has organized it". P32 confirmed that the ISO set performance indicators enhanced vigilance: "ISO has introduced an effect through the KPIs set for every procedure. Thus, the employees must stay vigilant for anything that might affect performance. Solutions are instantly introduced". P16 provided similar remarks: "we are more vigilant now because every transaction is followed up. There is the Department of Beneficiary Affairs which follows up and report directly to the office of the minister". The visibility of transactions and follow up had created a positive pressure, so employees pay due attention to make sure work was performed within the specified timeline: "ISO definitely has played a role. We make sure activities are performed within the

set timeframe to avoid any non-conformance" (P5). P20 demonstrated how ISO improved vigilance by enhancing visibility: "since ISO has defined the context I work in, it visualized the legal framework and work requirements. I am now aware of the wider work context".

Loose-coupling

Although ISO did not resolve the issue of interconnectedness between units, it enabled the identification of the bottlenecks. According to P20, "ISO has not impacted the extent of interconnectedness between departments, but it exposed the issue and defined the root cause". Similarly, P29 explained that "ISO identified the problem and the unit causing it. For example, if 'Injaz' electronic system is out of service, the whole organization is affected. ISO works as an organizing chain by identifying the unit and person behind the problem". This in turn facilitated better location of the problem and a better response plan.

Overall resilience

Participants provided inputs on how they thought enhanced visibility affected resilience in general. P1 commented: "now, it is easier to deal with difficulties than before. That is because in the past things were not clear and people did not know how to deal with such events". P13 asserted that auditing, which was introduced by ISO, enhanced capabilities by "setting order and organization". In other words, everyone knew exactly his role and what was he supposed to do. P26 shared similar remarks: "ISO, by organizing the work environment, made the organization more aware of its assignments, the surrounding environment and the organizations it works with. Thus, the organization is more prepared to deal with crises". P32 pointed to the important role ISO documentation played: "now, since we have been documenting procedures, steps and timeframes, everyone knows the milestones. Therefore, any challenge is dealt with early because there is a goal to be realised by a certain date". P4 added: "through my experience with the implementation of ISO, challenges have become clear. ISO focuses on making challenges clear to decision-makers. The data resulting from the ISO system expose these challenges and force top management to follow up". P5 briefly confirmed the same position saying: "ISO has enhanced visibility in the work environment, which enhanced resilience".

Conclusion

No doubt proactive risk management has become increasingly important as both efficiency and survival rely on it. This importance gains more momentum under volatile environments, where more opportunities for slippages and failures exist. This in turn signifies the essential role transparency plays both to predict and overcome or adapt to difficulties. Recognizing the significance of external transparency in risk management, internal transparency is perceived equally important to synergize efforts toward a better response to risks. However, regardless of the abundant research on transparency, there is still scarcity in studies when it comes to organizational resilience. No empirical works had investigated how organizational resilience behaves in relations to internal transparency.

This paper contributes to the debate on transparency by empirically emphasizing how internal transparency impacts organizational resilience. It shows that as internal transparency increases, the organization becomes more prepared to deal with risk. This results from the enhanced ability to cumulate, locate and share knowledge, which in turn improves learning, sensemaking, vigilance and response. The paper contributes also to the literature on organizational resilience by highlighting the central role of transparency to better contain adversaries. Last, the paper contributes to the literature on management systems as mediators toward better organizational resilience through enhancing internal transparency.

The findings carry implications for both policy and management. Internal transparency needs to be equally considered beside external transparency. It should be formally and informally instilled into the fabric of the organization to overcome any opacity and improve resilience both at the planning and operational levels. Similarly, management needs to ensure transparency is maintained both horizontally and vertically to enhance risk detection and elimination. Nevertheless, the results of the paper relate to a specific context, a knowledge-based public entity, which might be a limitation as different contexts might yield different perspectives or outcomes.

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Appendix F

Detailed figures of responses to questions.

1- Organizational Structure:

Table 1:

Communication	**Type/DG**	**DG1**	**DG2**
	Horizontal	14	10
	Vertical	2	4
	Semi-horizontal	0	1
	Missing	0	1
	Total	16	16(15)[12]
ISO Impact	**Impact/DG**	**DG1**	**DG2**
	Positive	10	10
	Negative	0	0
	No Impact	6	6
	Missing	0	0
	Total	16	16

Table 2:

Employee Engagement	**Type/DG**	**DG1**	**DG2**
	Horizontal	15	13
	Vertical	1	3
	Semi-horizontal	0	0
	Missing	0	0
	Total	16	16
ISO Impact	**Impact/DG**	**DG1**	**DG2**
	Positive	10	7
	Negative	0	0
	No Impact	5	8
	Missing	1	1
	Total	16	16(15)

Table 3:

Employee Empowerment	**Type/DG**	**DG1**	**DG2**
	Horizontal	5	4
	Vertical	11	12
	Semi-horizontal	0	0
	Missing	0	0
	Total	16	16
ISO Impact	**Impact/DG**	**DG1**	**DG2**
	Positive	5	7
	Negative	0	0
	No Impact	11	8
	Missing	0	1
	Total	16	16(15)

[12] Net responses after excluding missing responses.

Table 4:

Routine/Process Orientation	**Type/DG**	**DG1**	**DG2**
	Horizontal	16	4
	Vertical	0	11
	Semi-horizontal	0	0
	Missing	0	1
	Total	16	16(15)
ISO Impact	**Impact/DG**	**DG1**	**DG2**
	Positive	10	11
	Negative	0	0
	No Impact	6	5
	Missing	0	0
	Total	16	16

Table 5:

Multidisciplinary	**Type/DG**	**DG1**	**DG2**
	Horizontal	16	12
	Vertical	0	3
	Semi-horizontal	0	1
	Missing	0	0
	Total	16	16
ISO Impact	**Impact/DG**	**DG1**	**DG2**
	Positive	6	2/[13]3
	Negative	1	4
	No Impact	8	8/7
	Missing	1	2
	Total	16(15)	16(14)/16(14)

Table 6:

Cross-functionality	**Type/DG**	**DG1**	**DG2**
	Horizontal	16	13
	Vertical	0	3
	Semi-horizontal	0	0
	Missing	0	0
	Total	16	16
ISO Impact	**Impact/DG**	**DG1**	**DG2**
	Positive	7	5
	Negative	0	1
	No Impact	8	8
	Missing	1	2
	Total	16(15)	16(14)

[13] Slash indicates a difference in responses with regard to the 2008 and 2015 versions of the standard.

Table 7:

Expert-utilization	**Type/DG**	**DG1**	**DG2**
	Horizontal	10	10
	Vertical	6	6
	Semi-horizontal	0	0
	Missing	0	0
	Total	16	16
ISO Impact	**Impact/DG**	**DG1**	**DG2**
	Positive	6/10	7
	Negative	0	0
	No Impact	10/6	8
	Missing	0	1
	Total	16/16	15

Table 8:

Changeability	**Type/DG**	**DG1**	**DG2**
	Horizontal	15	11
	Vertical	1	5
	Semi-horizontal	0	0
	Missing	0	0
	Total	16	16
ISO Impact	**Impact/DG**	**DG1**	**DG2**
	Positive	9	10
	Negative	1	0
	No Impact	6	4
	Missing	0	2
	Total	16	16(14)

Table 9:

Leaders' Perception	**Type/DG**	**DG1**	**DG2**
	Satisfied	14	8
	Unsatisfied	1	6
	Not Sure	0	0
	Missing	1	2
	Total	16(15)	16(15)

2- Resourcefulness:

Table 10:

Problem Identification and Hazard Prioritization	**Type/DG**	**DG1**	**DG2**
	Practised	16	10
	Not Practised	0	5
	In-between	0	0
	Missing	0	1
	Total	16	16(15)
ISO Impact	**Impact/DG**	**DG1**	**DG2**
	Positive	6/9	11/14
	Negative	0	0
	No Impact	10/7	5/2
	Missing	0	0
	Total	16	16

Table 11:

Resource Mobilization	**Type/DG**	**DG1**	**DG2**
	Practised	16	16
	Not Practised	0	0
	In-between	0	0
	Missing	0	0
	Total	16	16
ISO Impact	**Impact/DG**	**DG1**	**DG2**
	Positive	7	6
	Negative	1	2
	No Impact	8	7
	Missing	0	1
	Total	16	16(15)

Table 12:

Organizational Learning	**Type/DG**	**DG1**	**DG2**
	Practised	13	15
	Not Practised	2	1
	In-between	0	0
	Missing	1	0
	Total	16(15)	16
ISO Impact	**Impact/DG**	**DG1**	**DG2**
	Positive	11	10
	Negative	0	0
	No Impact	5	5
	Missing	0	1
	Total	16	16

Table 13:

Sensemaking	**Type/DG**	**DG1**	**DG2**
	Practised	16	15
	Not Practised	0	0
	In-between	0	1
	Missing	0	0
	Total	16	16
ISO Impact	**Impact/DG**	**DG1**	**DG2**
	Positive	9	11
	Negative	0	0
	No Impact	7	5
	Missing	0	0
	Total	16	16

Table 14:

Self-organization	**Type/DG**	**DG1**	**DG2**
	Practised	16	16
	Not Practised	0	0
	In-between	0	0
	Missing	0	0
	Total	16	16
ISO Impact	**Impact/DG**	**DG1**	**DG2**
	Positive	7	9
	Negative	0	2
	No Impact	9	4
	Missing	0	1
	Total	16	16(15)

Table 15:

Creativity & Innovation	**Type/DG**	**DG1**	**DG2**
	Practised	12	11
	Not Practised	4	5
	In-between	0	0
	Missing	0	0
	Total	16	16
ISO Impact	**Impact/DG**	**DG1**	**DG2**
	Positive	7	10
	Negative	0	0
	No Impact	9	6
	Missing	0	0
	Total	16	16

Table 16:

Entrepreneurial Spirit	**Type/DG**	**DG1**	**DG2**
	Practised	13	11
	Not Practised	3	5
	In-between	0	0
	Missing	0	0
	Total	16	16
ISO Impact	**Impact/DG**	**DG1**	**DG2**
	Positive	6	3
	Negative	0	0
	No Impact	10	12
	Missing	0	1
	Total	16	16(15)

Table 17:

Mindfulness	**Type/DG**	**DG1**	**DG2**
	Practised	12	9
	Not Practised	2	6
	In-between	0	0
	Missing	2	0
	Total	16(14)	16
ISO Impact	**Impact/DG**	**DG1**	**DG2**
	Positive	8/9	7
	Negative	0	0
	No Impact	8/7	7
	Missing	0	2
	Total	16/16	16(14)

Table 18:

Coupling	**Type/DG**	**DG1**	**DG2**
	Practised	8	9
	Not Practised	4	5
	In-between	4	2
	Missing	0	0
	Total	16	16
ISO Impact	**Impact/DG**	**DG1**	**DG2**
	Positive	7/8	4
	Negative	3/2	5
	No Impact	6	4
	Missing	0	3
	Total	16/16	16(13)

Table 19:

Overall Resourcefulness	**Type/DG**	**DG1**	**DG2**
	Capable	12	10
	Incapable	3	5
	Missing	1	1
	Total	16(15)	16(15)
Overall ISO Impact	**Impact/DG**	**DG1**	**DG2**
	Positive	12/13	8
	Negative	0	0
	No Impact	4/3	8
	Missing	0	0
	Total	16/16	16